Tekla Structures 2023

Manage Tekla Structures

March 2023

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Managing Tekla Structures means customizing and deploying Tekla Structures for users in your organization or for your own use.

Types of users who manage Tekla Structures include:

- Tekla Structures administrators or BIM managers, who customize Tekla Structures for users in their organization.
- IT administrators who manage the network environment and Tekla Structures subscriptions, and deploy Tekla Structures for users.
- Individual users, such as freelancers, who have a personal Tekla Structures subscription and want to customize Tekla Structures for their own use.

1.1 Before you start using Tekla Structures

You must have a Trimble Identity to download Trimble products and to use your subscriptions.

Tekla Online services, includingTekla Structures subscriptions, use Trimble Identity for identification. You can use your Trimble Identity with other Trimble services, such as Trimble Connect and SketchUp 3D Warehouse.

For more information, see Create your Trimble Identity.

1.2 Get started with managing Tekla Structures in an enterprise company

To get started as a Tekla Structures administrator, familiarize yourself with the concepts related to installation, customization, and starting projects.

As a Tekla Structures administrator, you need a deeper understanding and more managed approach to defining and maintaining the configurations and settings that your users need in their work.

Workflow for administrators or BIM managers

The typical workflow for a Tekla Structures administrator or BIM manager is:

1. Plan the installation (page 12) needs for Tekla Structures.
2. Customize (page 32) and distribute the customizations to users in your company.
3. Set up new projects (page 132).

Workflow for IT administrators

As an IT administrator, you maintain the surrounding network environment, manage the Tekla Structures subscriptions, and deploy Tekla Structures for users.

The typical workflow for an IT administrator is:

1. Configure the network environment according to the installation requirements (page 22) for Tekla Structures.
2. Manage the users in your organization (page 352), and your subscriptions (page 353) or legacy on-premises licenses (page 353).
3. Deploy for users (page 22).

1.3 Get started with managing Tekla Structures in a small or medium company

Administrators in a small company typically manage the customization of Tekla Structures, as well as user accounts and subscriptions in your Tekla Online organization.

The typical workflow for an administrator in a small organization is:

1. Plan how you will install (page 12) and deploy Tekla Structures for users (page 22).
2. Manage the users in your organization (page 352), and your subscriptions (page 353) or legacy on-premises licenses (page 353).
3. Customize (page 32) and distribute the customizations to users in your company.
4. Set up new projects (page 132).

1.4 Get started with managing Tekla Structures as an individual user

If you are an individual user with your own personal Tekla Structures subscription, you might want to customize Tekla Structures for your own use.

Basic configuration for your own use is generally explained in the documentation of each feature. The customizations can be copied between different models. If you are configuring Tekla Structures for your own use, it is good to have a basic understanding of the folder structure for Tekla Structures installation (page 14) and files for configuring (page 44).

The typical workflow for an individual user is:

1. Install Tekla Structures.
2. Customize (page 32) for your projects and way of working.
3. Create templates (page 149).
4. Check your settings in the advanced options (page 105).

2 Plan the installation and set up Tekla Structures

Planning is important for ensuring that your installation of Tekla Structures meets your needs.

When planning the Tekla Structures installation, consider:

- The hardware and software components that you will need for the installation
- How you will distribute Tekla Structures to users (page 22)
- Which Tekla Structures environments (page 13) you will use
- How you will use the project and firm folders (page 16) to store customized settings.

2.1 Tekla Structures installation requirements

For information about recommended operating system and hardware specifications, see Tekla Structures .

Tekla Structures also requires some Microsoft redistributable packages. If these redistributable packages or newer versions of them are not already installed on your computer, they are automatically installed during the Tekla Structures software installation. For more information, see *Additional necessary software components* in the hardware recommendations.

If you create a customized installation package, make sure that the .NET Framework is installed on the client computers.

The following installers are also automatically installed during the Tekla Structures software installation:

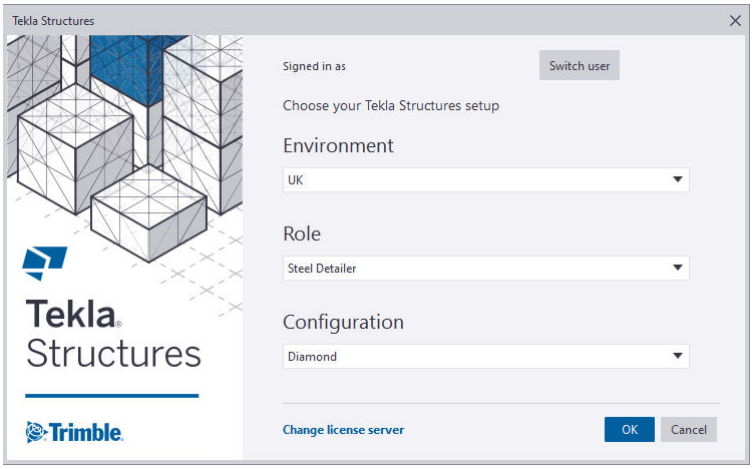
- Tsep File Dispatcher Launcher
- Tekla Warehouse Service

These installers are needed for Tekla Warehouse to work correctly.

2.2 Overview of environments, roles, and configurations in Tekla Structures

A Tekla Structures environment defines the materials, grades, profiles, drawing settings, component settings, and `.ini` file settings that are used in a specific locale. There are many different environments in Tekla Structures. When you select a specific environment when you start Tekla Structures, you get the settings for that locale. You can install several environments at the same time, and you can add more environments at any time.

If you do not install any environments, only the Blank environment is available. You can use the Blank environment as the basis for your own environment or project settings. It includes standard settings, such as parametric profiles, undefined bolt, material and rebar grades, and basic drawing layouts that you can complement from your own firm or project folders and Tekla Warehouse.



Some environments give you the opportunity to select a **role** when signing in. The role is independent from your subscriptions or licenses. Using roles makes the user interface and settings clearer, easier, and faster for the users' tasks. Settings, filters, reports, and the user interface are set up for the role that the user has. For example, preloaded settings in object properties that are not relevant for the role are not shown.

Role selection is primarily meant to be configured by Trimble and reseller localization personnel, and is typically part of the Tekla Structures installation package. However, advanced users and Tekla Structures administrators can also create their own roles inside their company organization. Additional content is available in the Tekla Warehouse offline and online collections.

Tekla Structures has many different configurations. The subscriptions or licenses that you have determine which configurations you can use.

See also

Hierarchy of Tekla Structures settings (page 32)

2.3 Folder structure for Tekla Structures installation

By default, the Tekla Structures app and environments are separated into different locations due to the requirements for Windows certification.

The files are installed in the following folders by default:

- The Tekla Structures app is installed in the `..\Program Files\Tekla Structures\<version>\` folder.

  When Tekla Structures is installed in the `Program Files` folder, any user can run the app but they cannot make changes to it. Configuration files are installed separately in the hidden `Program Data` folder. Installation in the `Program Files` folder requires administrator rights on the computer.

- Environments and extensions are installed in the hidden `..\ProgramData\Trimble\Tekla Structures\<version>\` folder.
- User settings are always installed in the `..\Users\<username>\AppData\Local\Trimble\Tekla Structures\<version>\` folder for each user, regardless of where the Tekla Structures app is installed. Each user has access to the files in their own user settings.

You can select the installation folder when you install Tekla Structures. You can use the default installation folders or install Tekla Structures in a normal file folder on the computer, such as `C:\TeklaStructures`.

If you want to prevent users from making changes to the Tekla Structures app, environments, or settings, we recommend that you use the default installation folders.

If users need to easily access all files for Tekla Structures or if it is not possible for users to install Tekla Structures with administrator rights, we recommend that you install Tekla Structures in a normal file folder. When you install Tekla Structures in a normal file folder, all files except for user settings are installed in that folder. Any users who have access to the folder have access to all of the installation, configuration, and environment files.

Hidden files and folders for Tekla Structures

When the Tekla Structures app is installed in the `Program Files` folder, some of the files needed to run Tekla Structures are located in hidden folders and are not visible.

If needed, you can make the hidden files and folders visible using the **Folder Options** in Windows.

Files related to the Tekla Structures app

The Tekla Structures app and files such as the following are installed under the `..\Program Files\Tekla Structures\<version>\` folder:

- `contentattributes_global.lst`
- `contentattributes_userdefined.lst`

  (in the USA environment: `contentattributes_customer.lst`)

Files related to environments

Environments and files such as the following are installed under the `..\ProgramData\Trimble\Tekla Structures\<version>\` folder:

- `analysis_design_config.inp`
- `contentattributes.lst`
- `dimension_marks.sym`
- `InquiryTool.config`
- `objects.inp`
- `objects.inp`
- `privileges.inp`
- `product_finishes.dat`
- `rebar_config.inp`
- `TeklaStructures.lin`
- `TilePatternCatalog.dtd`
- `TilePatternCatalog.xml`

The exact file location can vary depending on the folder structure of your environment files.

Files related to user settings

User settings and files such as the following are installed under the `..\Users\<username>\AppData\Local\Trimble\Tekla Structures\<version>\` folder for each user:

- `user.ini`
- `options.bin`
- customized property pane layout `PropertyTemplates.xml` and `PropertyTemplates.Drawing.xml` files
- customized ribbon and customized tab `.xml` files

- customized contextual toolbar `.xml` files
- customized toolbar `.json` files

Company folder structure

Using central project and firm folders makes taking backups and upgrading easier. For example, when upgrading to a new Tekla Structures version or updating the company logo, the files only need to be replaced in one place.

If you do not use Tekla Model Sharing, we recommend using project and firm folders (page 16) on a central file server for storing your models, and the setup files for company-specific and project-specific settings. Tekla Structures reads the settings from the central file server.

If you use Tekla Model Sharing, you can synchronize the project and firm folders through the Trimble Connect cloud service included in your Tekla Structures subscription.

Backing up important Tekla Structures folders

Model folders, and the firm and project folders contain valuable information and work. It is important to take backups of these folders and settings.

If your company has a system for taking automatic scheduled backups, schedule your system to take the backups at night time, outside working hours to prevent any possible conflicts in models.

If you use legacy on-premises licenses, also take a backup of the license entitlements and your active licenses.

Virus protection and Tekla Structures folders

Virus protection software can cause problems in saving models and drawings to the model folder. These problems might occur especially if you have saved your model on a network drive.

We strongly recommend that you add Tekla Structures to the safe list for your antivirus system, and set up your virus protection so that it does not block or scan actions in your model folder.

2.4 Project and firm folders

Project and firm folders are meant for storing customized files. Customized files can include custom ribbons, drawing styles, profile and material catalogs, or any other settings that you want to store for future use.

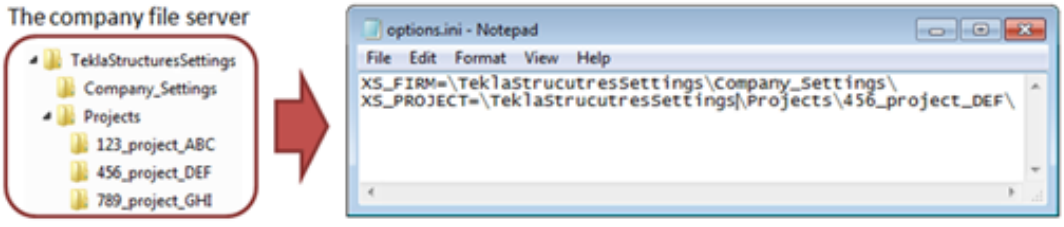
You can use the same files each time you start a new model or install a new version of Tekla Structures.

Folder	Typical contents
Firm	Settings that are used on the company level, such as company logo and drawing standard. Use the firm folder and its sub-folders to store customized files for the entire organization or company. The settings and files in the firm folder are meant to be used in all projects within the company. For example, let's say you regularly work for a company that has specific drawing layout standards it expects you to use. Customize the drawing templates once for the company and save them in the firm folder or in a sub-folder of the firm folder. You can then use the customized drawing templates for all future projects for that company.
Project	Settings that are used on a specific project. Use the project folder and its sub-folders to store customized files that are only used in a particular project. A project might consist of several models done by separate teams in different locations. You can save project-specific files and settings in the project folder, so that everyone in the project can use them. A project might also consist of one model that is shared by different companies.

Property files are always saved in the `\attributes` folder under the current model folder, such as `\TeklaStructuresModels\<my_building>\attributes`. We recommend that you copy these files to the project or firm folder, or to user-defined sub-folders under the project or firm folder.

Benefits of the project and firm folders

Using project and firm folders to store your customized settings makes it easier to update company settings, ensure that everyone uses the same settings in a project, and upgrade to a newer version of Tekla Structures.



Tekla Structures does not replace files in the project and firm folders when you install a new version. You can retain your customized files without having to copy and paste, or export and import from the previous versions. Using project and firm folders makes upgrading faster and easier. When you store

files in one place, it is also easier to update the settings and ensure that everyone in a project uses the same settings. Using project and firm folders also allows you to easily revert back to the default settings because your customized settings do not overwrite any of the system files.

Example:

In the current project, *123_project_ABC*, you have set up the properties for a concrete column, and saved them as *column_ABC*. To make these saved settings available for everyone working in the *123_project_ABC* project:

1. Copy `column_ABC.cc1` from the `\attributes` folder under the model folder to the `\123_project_ABC` project folder or on your file server, or to a user-defined sub-folder under the `\123_project_ABC` project folder.
2. Ensure that everyone in the project has the correct path for the `XS_PROJECT` advanced option in the `.ini` file.

Advanced options for defining the project and firm folders

Project and firm folders are defined by the `XS_FIRM` and `XS_PROJECT` advanced options.

To use the saved settings in a firm and a project folder, set the path to the folder by using the `XS_PROJECT` and `XS_FIRM` advanced options. These advanced options should be put in the initialization, `.ini`, files. You can have several different `.ini` files. You can define in the Tekla Structures shortcut which `.ini` files to run and which settings to apply.

It might be useful to create a startup shortcut on your desktop that contains all necessary folders for each project.

WARNING Changing an advanced option value in `.ini` files located outside the model folder does not affect the existing models. You can only update advanced options in the **Advanced Options** dialog box or in the `options.ini` file located in model folder; not from an `options.ini` file located in folders defined for the advanced options or . The `.ini` files are read also when you open an existing model, but only new advanced options that do not exist in `options_model.db` or `options_drawings.db` are inserted, for example, such options that are not yet in the **Advanced Options** dialog box but have been added in the software.

Create a project or firm folder

When working within one company, the firm and project folders are usually located in network folders or on a shared file server accessible to all users so that everyone can access them.

When working within Tekla Model Sharing projects, you can use a folder in the linked project (page 182) as the project or firm folder.

1. Create an empty project or firm folder in a shared location.
2. In Tekla Structures, go to the **File** menu and select **Settings** --> **Advanced options**.
3. In the **File locations** category, define the path to the firm or project folder for the advanced option `XS_FIRM` or `XS_PROJECT`.
4. Restart Tekla Structures for the change to take effect.

Fixed sub-folders in project and firm folders

Some files need to be stored in particular, or *fixed*, sub-folders under project and firm folders. If the files are not stored in these folders, Tekla Structures cannot read the files. See the files which should be stored in fixed sub-folders in the following table.

XS_FIRM or XS_PROJECT sub-folder	Further sub-folders and necessary files	See also
`\AdditionalPSets`	Use this folder to store additional property set configuration files for IFC export in the `.xml` format.	• Property set configuration files used in IFC export
`\CustomInquiry`	Use this folder to store: • report templates for custom inquiries as `.it` files • the `InquiryTool.config` file for defining which attributes are included by default in the **Manage content** dialog box for selecting the properties shown in custom inquiries	• Custom inquiry
`\Drawing Details`	Use this folder to store 2D drawing details as `.ddf` and `.png` files. Note that to see the drawing details stored in the `\Drawing Details` sub-folder under a firm or project folder in Tekla Structures:	• 2D Library in drawings

XS_FIRM or XS_PROJECT sub-folder	Further sub-folders and necessary files	See also
	1. In the **Drawing 2D library** side pane, click the  **Folder** button. 2. Select **Firm** or **Project**.	
\macros	This sub-folder has the following sub-folders: • \Drawings Use this folder to store macros related to drawings as .bmp, .cs, and .cs.pdb files. • \Modeling Use this folder to store macros related to modeling as .bmp, .cs, and .cs.pdb files. Note that macros are primarily read from the folder defined by the XS_MACRO_DIRECTORY advanced option. This advanced option can point to any folder, not just the \macros sub-folder of a firm or project folder.	• Working with applications • XS_MACRO_DIRECTORY
\profil	This sub-folder can have the following sub-folders: • \ShapeGeometries Use this folder to store shape geometry descriptions as .tez or .xml files. • \Shapes Use this folder to store shape descriptions as .xml files.	• Customize the shape catalog (page 294)
\ProjectOrganizerData	This folder has the following sub-folders: • \DefaultCategoryTrees Use this folder to store Organizer categories as .category files.	• Customized default setup for Organizer

XS_FIRM or XS_PROJECT sub-folder	Further sub-folders and necessary files	See also
	• \PropertyTemplates Use this folder to store property templates from Organizer as .propertytemplate files. • \ExcelTemplates Use this folder to store customized templates in .xlt format for exporting object property values from Organizer.	
\PropertyRepository\Templates	Use this folder to store customized property pane layouts in the PropertyTemplates.xml file.	• Distribute customized property pane layouts by using a project, firm, or environment folder (page 42)
\Symbols	Use this folder to store: • symbols as .sym and .dwg files • other images and bitmaps used in drawings Note that symbols are primarily read from the folder defined by the DXK_SYMBOLPATH advanced option. This advanced option can point to any folder, not just the \Symbols sub-folder of a firm or project folder.	• Add symbols in drawings • DXK_SYMBOLPATH
\template	Use this folder to store graphical templates used in drawing layouts as .tpl files. Note that templates are primarily read from the folder defined by the XS_TEMPLATE_DIRECTORY advanced option. In the same way, the tpled.ini is primarily read from the folder defined by the XS_TPLED_INI advanced option.	• XS_TEMPLATE_DIRECTORY • XS_TEMPLATE_MARK_SUB_DIRECTORY

XS_FIRM or XS_PROJECT sub-folder	Further sub-folders and necessary files	See also
	These advanced options can point to any folder, not just the `\Template` sub-folder of a firm or project folder. This folder also contains the following sub-folders: • `\mark` Use this folder to store graphical templates used in drawing marks. Note that templates used in drawing marks are primarily read from the folder defined by the `XS_TEMPLATE_MARK_SUB_DIRECTORY` folder. This advanced option can point to any folder, not just the `\template\mark` sub-folder of a firm or project folder. • `\settings` Use this folder to store the `tpled.ini` file, which defines environment-specific template settings, and the user-defined attributes (UDAs) related to Template Editor in the `contentattributes_user-defined_YOUR_COMPANY.lst` file. Note that to read Template Editor files from the `template \settings` sub-folder within a firm or project folder, the `XS_TEMPLATE_DIRECTORY_SYSTEM` advanced option needs to point to the `\.ini` sub-folder in the firm or project folder.	

2.5 Tekla Structures installation for administrators

You can install Tekla Structures on users' workstations using the standard installation packages or by creating your own centralized installation using MSI packages. You can also run Tekla Structures in a virtual environment.

If you have legacy on-premises licenses, you must also install a license server on your own hardware.

Tekla Structures installation on workstations

You can install Tekla Structures on each workstation using the standard installation packages or by creating your own centralized installation using MSI packages.

You can download Tekla Structures software and environments from Tekla Downloads. To use the latest software, we recommend that you install the latest service pack of Tekla Structures. Service packs include improvements and fixes to the previous main version or service pack of Tekla Structures. Service packs are available for all users with a valid maintenance contract or subscription.

NOTE You must install Tekla Structures with administrator rights.

When you use centralized installation, the end users do not need administrator rights for the installation.

Installation files for Tekla Structures software and environments

The installers for the Tekla Structures software and environments are `.msi` installers. Environment installers include sets of `.tsep` installers that contain the environment files and settings.

When installing a new version of Tekla Structures, first install the software, then install one or more environments. The environment `.msi` installers are installed to your computer before opening Tekla Structures.

When you run the environment `.msi` installer, the installer creates the environment folder and copies the `.tsep` installers to the `..\Tekla Structures\<version>\Extensions\To be installed` folder. The installer also creates the `RemoveEnv.bat` and `ToBeRemoved.txt` files, and places them to the `..\Environments\<environment>` folder. These files are used when uninstalling an environment.

When running the environment `.msi` installer, you can select in the installation wizard that the `.tsep` installers are run immediately when running the environment installer. If you do not run the `.tsep` installers immediately, the `.tsep` installers are run when you open Tekla Structures for the first time

after the installation. In this case, Tekla Structures opens a dialog box that shows the installation progress of the `.tsep` installers.

You can cancel the installation of extension `.tsep` installers in the dialog box and postpone them to the next Tekla Structures start-up. The queued environment `.tsep` installers are not canceled, they are installed even if you cancel. The `.tsep` packages contain information about the product type: environment or extension, which is used to determine which installers can be canceled.

Running the `.tsep` installers does not require administrator rights. The `.tsep` installers install the environment files to the `..\Tekla Structures \<version>\Environments\<environment>` folder.

If you are installing several environments for the first time, we recommend that you do not run the `.tsep` installers with the `.msi` installer. Some of the `.tsep` packages are used in more than one environment and the same version of a `.tsep` package is only installed once. Starting Tekla Structures for the first time after installation can take a long time particularly if you have installed several environments, as all the `.tsep` installers are run.

Standard Tekla Structures installation

The Tekla Structures installation wizard has detailed instructions about the installation.

For more information, see Install and license Tekla Structures.

Centralized Tekla Structures installation

Installing Tekla Structures centrally across the company network saves time in a large company when there are many Tekla Structures users.

Centralized installation allows you to run the Tekla Structures installation silently in the background so that the users do not see the installation wizard dialog boxes. For detailed information about centralized installation, see Centralized distribution of Tekla Structures 2022.

Tekla Structures installation in a virtual environment

You can also run Tekla Structures in a virtual environment. Application and desktop virtualization allow users to run software from a server on the network without locally-installed Tekla Structures on their workstation. Using Tekla Structures from the server ensures that all users in a project are using the same project environment set-up. For detailed information about

installation in a virtual environment, see Use Tekla Structures with application and desktop virtualization (page 28).

2.6 Install .tsep packages

Tekla Structures extension packages (`.tsep` packages) are Tekla Structures extensions or additional environment content installers.

Extensions are not part of the Tekla Structures product release. `.tsep` packages are available for download in Tekla Warehouse.

You can install `.tsep` packages in these ways:

- Directly
- In Tekla Structures extension manager
- Centrally

Install .tsep packages directly

TIP If the `.tsep` installer is not set to open with **Tekla Structures extension manager** by default, you can set it manually. Right-click the `.tsep` installer and select **Properties**. In **Opens with**, select **Change** and browse to `TsepFileDispatcherLauncher`.

1. Double-click the `.tsep` installer that you have downloaded.

   The **Tekla Structures extension manager** dialog box opens with the name of the extension that is going to be installed.

   By default `.tsep` installers are opened with **Tekla Structures extension manager**. Some `.tsep` installers are run directly from Tekla Warehouse with the **Insert into model** option.

2. Select the Tekla Structures versions to which you want to import and click the **Import** button. The next time you start Tekla Structures, the extension is automatically installed, and it is shown in **Tekla Structures extension manager**.

Install .tsep packages in Tekla Structures extension manager

You can install a `.tsep` installer from **Tekla Structures extension manager** in Tekla Structures.

TIP In **Extension manager**, you can list the extensions by type: extension or environment. You can also search for content based on name, author, description, and type of extension.

1. In the **Applications & components** catalog, click  > **Manage extensions** --> **Extension manager** .
2. Click **Import** and browse to the `.tsep` installer that you want to install.
3. Click **Open**.

The imported `.tsep` is installed the next time you start Tekla Structures. It is shown in **Tekla Structures extension manager**, and is ready for use in the **Applications & components** catalog.

Uninstall .tsep packages in Tekla Structures extension manager

1. In **Tekla Structures extension manager**, select the `.tsep` packages that you want to uninstall.

   Use **Ctrl** or **Shift** to select more than one `.tsep` package.
2. Click **Remove**.

The `.tsep` packages are removed when you restart Tekla Structures.

Uninstall .tsep packages in Tekla Structures Extension Package (TSEP) builder and test runner

1. To open the **Tekla Structures Extension Package (TSEP) builder and test runner** dialog box, browse to `..\Program Files\Tekla Structures\<version\bin\` and double-click `TeklaExtensionPackage.Builder.exe`.
2. On the **Uninstall TSEP based extensions** tab, select the `.tsep` packages that you want to uninstall, then click **Uninstall selected**.

   Use **Ctrl** or **Shift** to select more than one `.tsep` package.

The selected `.tsep` are removed. You do not need to restart Tekla Structures.

Centralized installation of .tsep packages

You can centrally install a batch of `.tsep` installers across company workstations. This method is meant for system administrators.

By default, the .tsep installers waiting for installation are stored in \ProgramData\Trimble\Tekla Structures\<version>\Extensions\To be installed. To install centrally, copy the .tsep installers to the %XSDATADIR%\Extensions\To be installed folder. If the folder does not exist yet, create it.

When Tekla Structures starts, it checks the available .tsep installers from the \To be installed folder and installs them automatically. If there is an older version of the same extension package, it is uninstalled before installing the new version. Installation is canceled if the same or newer version has already been installed.

- The installed .tsep installers are stored in the %XSDATADIR%\Extensions \Installed folder.
- Invalid .tsep installers are uninstalled and moved to the %XSDATADIR% \Extensions\Invalid installations folder.
- Canceled .tsep installers are stored in %XSDATADIR%\Extensions \Cancelled installations.

Tools for copying .tsep installers

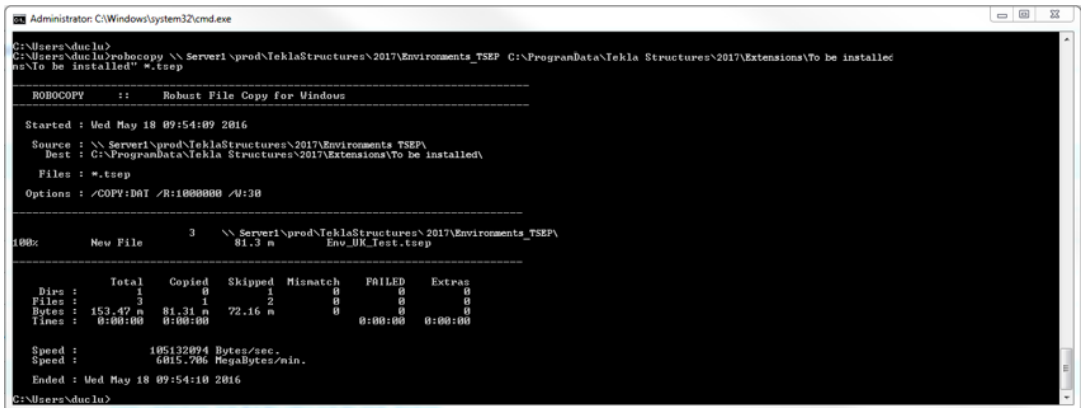
We recommend that you use ROBOCOPY from the command prompt (cmd.exe) to copy the .tsep installers. You can find more information about ROBOCOPY on the Microsoft website.

The basic syntax for ROBOCOPY is: robocopy <Source> <Destination> [<File>[...]] [<Options>]

For example, to copy .tsep installers in Tekla Structures 2023:

```
robocopy
"\\Server1\prod\TeklaStructures\2023.0\Environments_TSEP"
"C:\ProgramData\Trimble\Tekla Structures\2023.0\Extensions\To be
installed"
*.tsep
"C:\Program Files\Tekla Structures\2023.0\bin
\TeklaExtensionPackage.TepAutoInstaller.exe"
2023.0 "C:\ProgramData\Trimble\Tekla Structures\2023.0" "2023"
```

This command copies all .tsep installers from the \Server1 network directory to the local user's \To be installed folder. After copying, TepAutoInstaller.exe installs all .tsep installers from the local user's \To be installed folder. Installing the packages allows users to start Tekla Structures without first waiting for the installations to complete.



Centralized uninstallation of .tsep packages

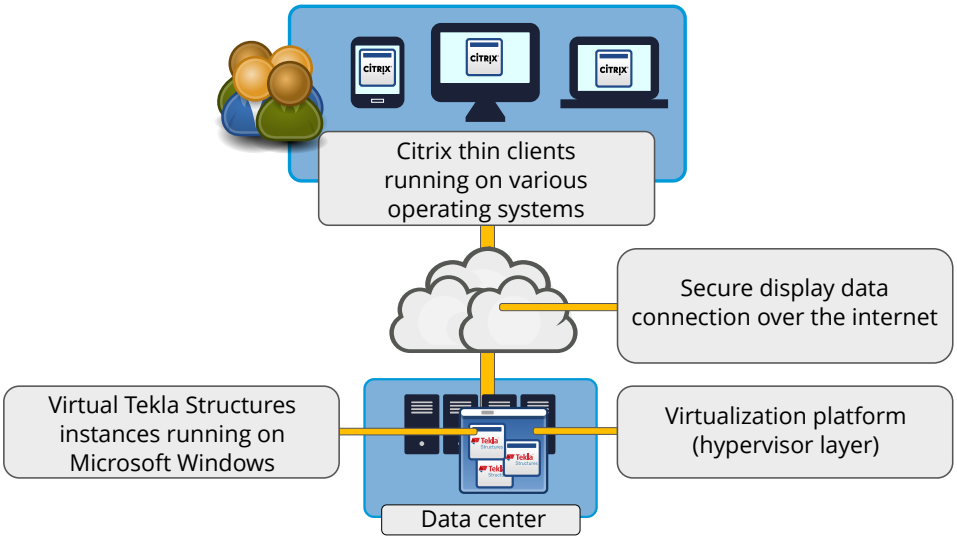
You can uninstall `.tsep` packages in batches by creating an empty file named `RemoveExtensionOnStartup` in the folder for each extension that you want to uninstall. For example, `\ProgramData\Trimble\Tekla Structures\<version>\Extensions\Installed\[Extension_To_Be_Uninstalled]`.

The extensions are removed the next time that Tekla Structures is started.

2.7 Use Tekla Structures with application and desktop virtualization

Using Tekla Structures together with Citrix Virtual Apps and Desktops with Azure is a flexible and safe way to quickly add users to Tekla Structures projects without locally installing Tekla Structures.

This image shows the main concepts in Tekla Structures virtualization.



Citrix application and desktop virtualization products are products of Citrix Systems, Inc.

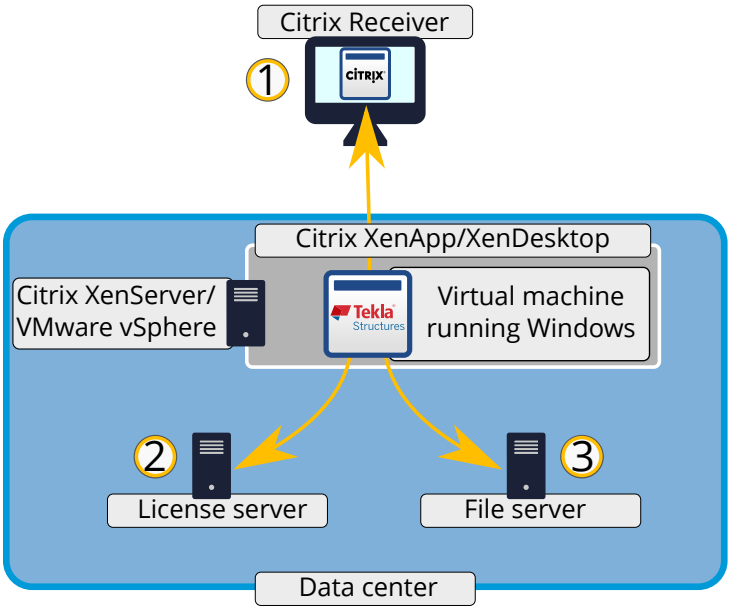
Streaming applications from the server makes it possible to use Tekla Structures on client computers, tablets, and smartphones that have different hardware and software configurations. Tekla Structures runs on Windows on the remote server and the virtualization solution allows client devices to be used for display and user input.

Users connect through a secure connection to the data center. The project data is stored only on the server. Using Tekla Structures from a centralized location ensures that all users in the project are using the same project environment.

Prerequisites for using Tekla Structures in a virtual environment

We recommend using Citrix Virtual Apps and Desktops with Azure for Tekla Structures virtualization. For more information, see Citrix Virtual Apps and Desktops with Azure. .

This image shows the main components in Tekla Structures virtualization.



1. Users can access Tekla Structures using a thin client application, such as Citrix Receiver. Users can use Citrix XenApp client or Citrix XenDesktop desktop viewer on any supported operating system and hardware. Multiple concurrent clients can share one virtual machine instance.
2. Each `TeklaStructures.exe` running in the virtual environment must have a valid subscription or license.

   If you use legacy on-premises licenses, you can use a local, enterprise, or cloud Tekla license server. The license server can be hosted in the data center or outside of the data center.
3. Read and write project files from network-attached storage (NAS). Fast disk access is required.

   Never store models on the local disk of the virtual server. Store project data, including environments, on another server in the data center or on a file system inside the company network.

   Because accessing files from the client's local file system can be slow, we recommend that you avoid accessing files from the client's local file system as much as possible.

Set up the virtual environment for Tekla Structures

Set up the server, define delivery groups, and install the Tekla Structures software and environments on the server. Ensure that Tekla Structures users install the Citrix Receiver on their computers.

After setting up the virtual environment, you can use Tekla Structures on the virtual desktop in the same way as if it was installed on your own computer.

When you use the virtual desktop for the first time, you can give read and write access to your local files in the file access dialog box. Giving access to your local files has the following limitations:

- Referencing local files from your computer directly in Tekla Structures is not recommended. If you need to access those files in Tekla Structures, copy them to a shared network location first.
- Model folders are not copied to the client computers.

The Citrix Receiver client is updated frequently. Always install the latest client when the web user interface prompts you to do so.

1. Set up the server.

   We recommend deploying Tekla Structures using Citrix Virtual Apps and Desktops with Azure.

   For more information, see Citrix Virtual Apps and Desktops with Azure.

2. Install Tekla Structures software and environments on the server.

   Never store models on the local disk of the virtual server. Store project data on another server in the data center or on a file system inside the company network. Select the correct network location for the model folder during the Tekla Structures installation.

   Tekla Structures environment settings are the same for all users that use the same virtual machine. As with normal desktop installations, you must still ensure that the environments on different virtual machines are the same.

   We strongly recommend that you use standard Tekla Structures environments and customize them with company or project-specific settings on the network file server.

3. Install Citrix Receiver on each Tekla Structures client computer.

   We recommend that you use the Citrix Receiver web user interface.

   a. In your web browser, open the Citrix Receiver web user interface.

      Use the `https` address provided by your company's administrators.

   b. To install Citrix Receiver, follow the steps in the installation wizard.

      In the installation wizard, do not create an account or sign in. Finish the installation, then return to the Citrix Receiver web user interface.

   c. After the installation, return to the Citrix Receiver web user interface and sign in with the credentials provided by your company's administrators.

   d. Select the virtual desktop. If the virtual desktop does not start automatically, run the downloaded Citrix (`.ica`) file.

3 Customize Tekla Structures for users

As the Tekla Structures administrator or BIM manager, you can customize Tekla Structures to use your company's standards. Customizing Tekla Structures for the company standards and projects needs allows end user to focus on the design process.

Each new version of Tekla Structures introduces new features and functionalities to improve the overall process used for completing a project. Tekla Structures has multiple environments to suit the needs and requirements of specific markets. Many features are localized in each Tekla Structures version. Most of the changes in versions are focused on making the default saved attributes more consistent, organized, simplified, and practical.

Before you start customizing Tekla Structures to suit the needs of your company and your projects, collect the needed information, such as drawing standards, used profiles, grades and materials, company logos, and naming conventions.

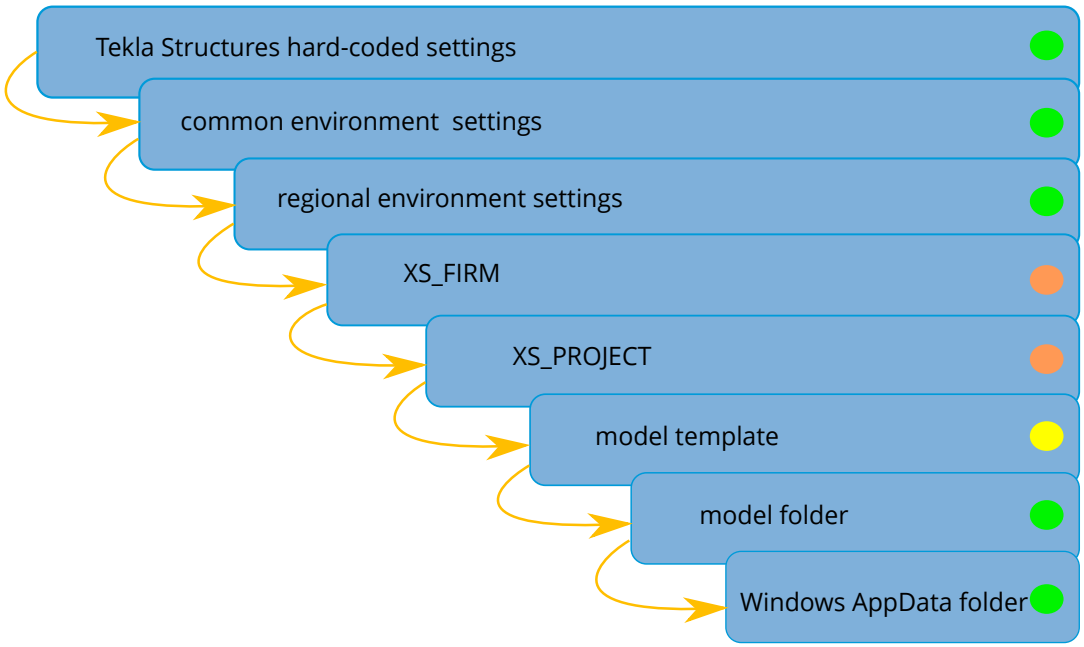
The overall localization of Tekla Structures can be divided into these layers:

- Tekla Structures environment
- Company-level settings
- Project-level settings

With the exception of the Tekla Structures environment, these settings are mainly managed by company administrators.

3.1 Hierarchy of Tekla Structures settings

Tekla Structures settings are managed on several layers. On the highest layer there are hard-coded default settings that you cannot change directly but that you can override on lower layers.



- These settings are constantly active
- Tekla Structures reads these settings when a model is opened
- Tekla Structures reads these settings when a model is created

1. Common environment settings that have preset values included in the installation. The common environment is always included in the installation.

   Do not modify or remove the common settings.
2. Regional environment settings with preset values that are suited for specific regional areas.
3. The advanced option `XS_FIRM` that defines a folder, typically on a network drive, that loads settings for all users within your company.

   This folder is the main container of files for the company.
4. The advanced option `XS_PROJECT` that defines a folder, typically on a network drive, that loads important settings for all users within a specific project (page 132).
5. The model template that is loaded from the environment, or from the network folders. The model template is loaded only once when you start creating a new model.
6. The model folder content that is saved locally when you add or edit settings.

   If you save content in the model folder, the saved settings in other locations override the same settings in the model folder.

7. The Windows AppData folder for user-specific settings related to the Tekla Structures user interface.

Environment settings for administrators

Environment settings include common settings that are the same in all environments, and country-specific or region-specific settings that are localized by your local Trimble office or reseller.

Common environment settings

NOTE Do not modify or remove the common settings.

All settings and files that are the same in all environments are located in the `\Tekla Structures\<version>\Environments\common` folder. Files and settings that are specific to an environment are located in separate environment folders.

The `env_global_default.ini` file is also located in the `\common` folder. This file determines the standard settings, and it is the first file that is read. Other initialization files (page 48) are read after this file, and if the other files contain the same settings, they override the previous settings.

Country-specific environment settings

Country-specific, or region-specific, settings are located in environments folders. The folder structure of the environments can vary, but the same kind of settings exist. For example, the settings that are localized include profile database, material database, reports, selection filters, view filters, components and custom components, macros, user-defined attributes, and drawings settings.

Company settings for administrators

Company-level settings are mainly settings that are used throughout the company for all projects. These settings are set using `XS_SYSTEM` and `XS_FIRM`.

For a larger company with subsidiaries, the settings could be used as follows:

- `XS_SYSTEM` might contain multiple paths, and it points to general settings inside the company. These can be company logo, reports, printer settings, drawing settings, templates, for example. These are settings that very seldom change, and are stored on a server available for all. For example, if the company logo is updated, it only has to be replaced in one place.

- `XS_FIRM` points to the firm folder set up by the company, or a subsidiary. The folder contains all the company settings used at the particular office. These can be logos, drawing settings, templates, reports, or printer settings, for example. The firm folder can also have user-defined sub-folders for storing property files.
- `XS_PROJECT` points to the project folder. The folder contains project settings, such as logos for contractors and fabricators, or drawing settings, for example. The project folder can also have user-defined sub-folders for storing project-specific property files.

For more information about the folder search order, see Folder search order (page 45).

You can also use company-specific collections in Tekla Warehouse online or offline in your own network. For more information, see Getting started with Tekla Warehouse.

Access to offline collections is managed with folder rights in your network, and on the collection level in the `collections.json` file on each user's computer.

```
 "collections"
"\\\\server-A\\company\\Tekla Structures collection"
```

The `collections.json` file can be shared with selected users by copying it to the `C:\Users\Public\Documents\Tekla\Tekla Warehouse\` folder.

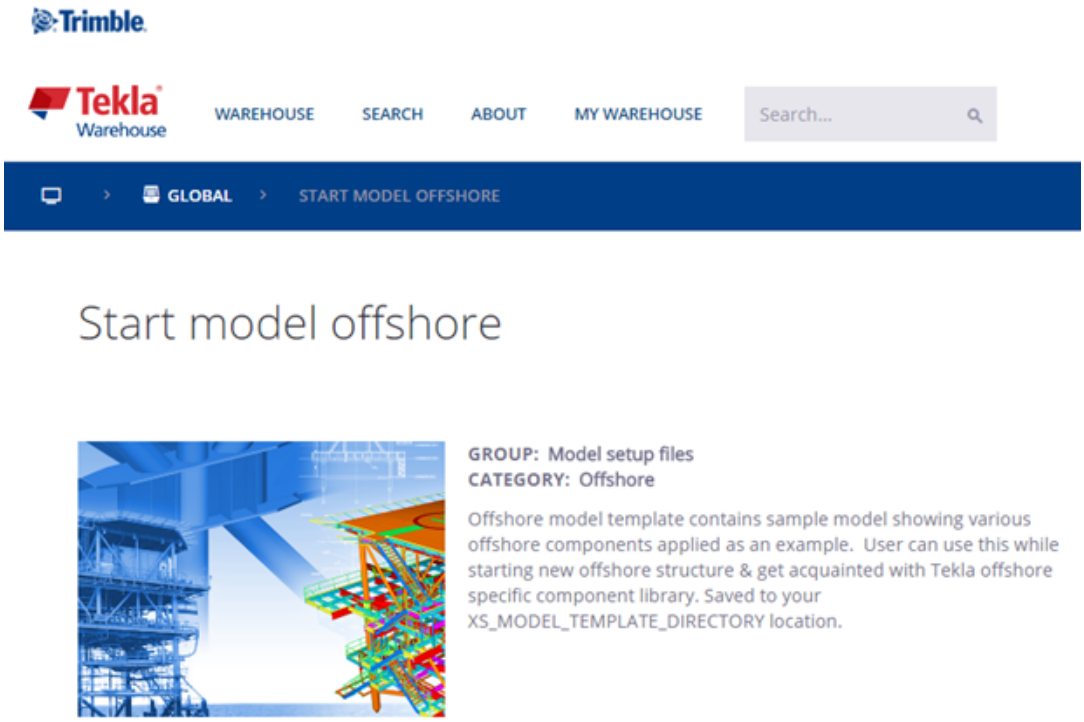
Customization of model templates

You can save a model with customized settings and use the model as a template when you create new models. Using model templates can be very useful if your company has different kinds of projects, such as, parking garages, office buildings, bridges, and industrial.

To create a model template, see .

By default, the model template folder is located in your environment folder, under `..ProgramData\Trimble\Tekla Structures\<version>\environments\<your environment>\`. The exact folder location might vary depending on your environment and role. Use the advanced option XS_MODEL_TEMPLATE_DIRECTORY to define a different location.

You can download, share, and store model templates in Tekla Warehouse. This image shows an example of a model template in Tekla Warehouse.



The **Insert into model** button in Tekla Warehouse installs the model template directly in the folder defined by `XS_MODEL_TEMPLATE_DIRECTORY`. You can immediately use the template when creating a new model.

Update model templates

When you upgrade Tekla Structures, we strongly recommend that you update your model templates.

1. Create a new model using an existing model template.
2. Give the model the same name as in the previous Tekla Structures version.
3. Open a 3D view.
4. On the **File** menu, click **Diagnose and repair** --> **Diagnose model**.
5. On the **View** tab, click **Screenshot** --> **Project thumbnail** to create a project thumbnail, or add a custom image named `thumbnail.png` in the model folder.

   The preferred size of the image is `120 x 74` pixels.
6. On the **File** menu, click **Save as** --> **Save**.

   If you do not do this, a message might appear warning about the model being created with a previous version.
7. On the **File** menu, click **Save as** --> **Save as model template**.
8. Update the content of the model template.

a. Select which catalogs, drawing templates, report templates, and model sub-folders you want to include in the model template.

b. Manually remove all `*.db` files (environment database, options database files) from the model folder.

   Do not remove the `db.idrm` and `xslib.idrm` files. They are part of the model.

c. Click **OK**.

The `*.bak`, `*.log` and `xs_user` files are automatically removed from the model folder.

The model template is saved in the location defined by `XS_MODEL_TEMPLATE_DIRECTORY`.

You now have a sample image for your model template. The **Applications & components** catalog is now also in order and easy to use.

Customization of reports and drawings

If your company already has graphical templates in the DXF, DWG, or DGN format, you can convert these templates to Tekla Structures templates.

For detailed instructions, see the information about AutoCAD and Microstation files in the Template Editor User's Guide.

For information about how to create your own templates and reports, see the Template Editor User's Guide, , and Templates (page 149).

Create cloning templates for drawings

Creating cloning templates for drawings allows you to use existing drawings as the basis for creating new drawings of similar parts, assemblies, or cast units. You only need to modify the parts of the cloned drawing that differ from the original drawing.

Consider cloning drawings when:

- There are several similar parts, assemblies, or cast units in the model.
- You need to produce single-part, assembly, or cast-unit drawings of similar parts, assemblies, or cast units.
- The drawings need a lot of manual editing.

For example, you can create a drawing for one truss, edit the drawing, then clone it for similar trusses. You only need to modify the cloned drawings where the trusses differ.

The cloned drawing might contain more parts than the original drawing. Part properties, marks, associative notes, and related text objects are cloned from a similar part in the original drawing.

You can clone drawings by using **Master Drawing Catalog** templates. A cloning template in the **Master Drawing Catalog** can also be used in other

models. You can use cloning templates in projects that have the same kind of drawings.

1. In the **Document manager**, select a drawing.
2. Right-click, select **Add to Master Drawing Catalog**, then fill in the required properties.

The cloning template can be found under **Cloning templates** in the **Master Drawing Catalog**. To use cloning templates in other models, open the **Master Drawing Catalog** in the model, click the  button on the toolbar, and add the model where the templates are saved.

For more information about the **Master Drawing Catalog** and cloning templates, see Create drawings in Master Drawing Catalog.

3.2 Distribute customized ribbons by using a firm or environment folder

Administrators can distribute the customized ribbon files to other users in the company by placing the ribbon files in a firm or environment folder.

For example, you can create company ribbons and save them in the firm folder. These ribbons are shown in the Tekla Structures user interface for all users who use the same firm folder.

Add ribbons to a firm or environment folder

1. In the Ribbon editor, create the modeling and drawing ribbons that you want to share.

   The ribbons are saved in the `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UI\Ribbons` folder.

   If you cannot find the folder, ensure that you are able to view the hidden files and folders on your computer.
2. Copy the entire `\Ribbons` folder either to your company's firm folder or to the system folder.
3. If the ribbon contains user-defined commands, create a sub-folder named `\Commands` on the same level as the `\Ribbons` folder, and copy the `UserDefined.xml` file from the `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UI\Commands` folder to the `\Commands` folder you just created.
4. Restart Tekla Structures.

Loading order of custom ribbons

Tekla Structures loads the ribbons in the following order:

1. Tekla Structures default ribbon
2. Company ribbons in the environment folders
3. Company ribbons in the firm folder
4. User-defined ribbons under `%localappdata%`

Ribbons that are loaded later override previously loaded ribbons that have the same combination of configuration and editing mode. For example, a ribbon defined in the firm folder overrides ribbons in the environment folders.

If you have a customized ribbon in the `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UI\Ribbons` folder, it overrides company ribbons. To use the ribbon in the environment or firm folder, open the Ribbon editor and click **Restore**. Alternatively, you can remove or rename your own customized ribbons.

Naming convention for ribbon files

The customization tool saves the custom ribbons as `.xml` files. The naming convention for these files is:

`<Tekla-Structures-configuration_identifier>--<Tekla-Structures-editing-mode>.xml`

The name consists of an internal configuration name, a separator of two dash characters (--), an internal editing mode name, and the file name extension `.xml`. For example, the **Full** license modeling ribbon is called `albl_up_Full--main_menu.xml`.

Configuration identifier	Configuration name
`albl_up_Diamond`	**Tekla Structures Diamond**
`albl_up_Graphite`	**Tekla Structures Graphite**
`albl_up_Carbon`	**Tekla Structures Carbon**
`albl_up_Construction_Modeling`	**Construction Modeling**
`albl_up_Developer`	**Developer**
`albl_up_Drafter`	**Drafter**
`albl_up_Educational`	**Educational**
`albl_up_Engineering`	**Engineering**
`albl_up_Full`	**Full**
`albl_up_PC_Detailing`	**Precast Concrete Detailing**
`albl_up_Rebar_Detailing`	**Rebar Detailing**
`albl_up_Steel_Detailing`	**Steel Detailing**

Configuration identifier	Configuration name
`albl_up_Tekla_Structures_Primary`	**Primary**
`albl_up_Viewer`	**Project Viewer**

Editing mode	Purpose
`main_menu`	Modeling ribbon
`edit_draw_menu`	Drawing ribbon
`plan_main_menu`	Importing ribbon

3.3 Distribute customized tabs by using a firm or environment folder

As an alternative to customized ribbon files, which override the existing ribbon, you can distribute customized tabs to other users in the company by placing the tab files in a firm or an environment folder.

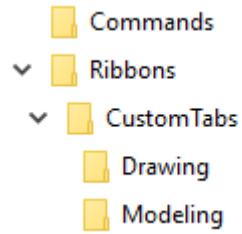
The customized tabs are automatically appended to the end of the ribbon for all users who use the same firm or environment folder. An administrator can distribute customizations to all users in the company while still allowing individual users to customize their ribbons.

These customized tabs do not appear in the Ribbon editor, so the users are not able to edit them. When an administrator updates the contents of a customized tab, the users receive the update when they restart Tekla Structures. Tabs are not configuration-specific. They are imported regardless of the user's Tekla Structures subscription configuration. If the tab contains commands that are not available in the user's configuration, the commands appear dimmed on the ribbon.

NOTE If you use a firm folder to distribute the custom tabs, set the firm folder path in an `.ini` file, such as `user.ini`, `teklastructures.ini`,`project.ini`, or `company.ini`. If you set the firm folder path in the advanced option **XS_FIRM,** the tab file does not work correctly because the **XS_FIRM** definition in the advanced options is made on the model level and the custom tab is not initialized.

---

1. Create the following folder structure in your company's firm folder or in the system folder.



2. In the Ribbon editor, create a customized tab and add commands to it.
3. Save the ribbon.
4. Go to the `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UI\Ribbons` folder.
5. In a text editor, open the ribbon `*.xml` file that contains the tab that you want to share with other users.
6. Remove all the other content from the ribbon file except the first row and the description of the tab that you want to share.

   Alternatively, you can copy the content to a new text file.

   For example:

```
<?xml version="1.0" encoding="utf-8" standalone="yes"?>
<Tab Header="My Tab" IsCollapsed="false" IsUserDefined="true">
  <SimpleButton X="0" Y="0" Width="3" Height="4"
Command="Common.Interrupt" Text="command:ShortText" Icon="myicon.png"
ShowText="true" ShowIcon="true" />
  <SimpleButton X="3" Y="0" Width="3" Height="4"
Command="RibbonEditor.Open" Text="command:ShortText" Icon="somefolder
\myicon2.png" ShowText="true" ShowIcon="true" />
</Tab>
```

   The button icons use relative paths. The icon path is relative to the `*.xml` file where tab is read from. For example `Icon="myicon.png"` refers to an icon in the same folder as the `*.xml` file, and the `Icon="somefolder\myicon2.png"` refers to an icon in a sub-folder.

   Alternatively, you can also create paths to folders at levels above the current folder: `Icon="..\myicon.png"`.

7. Save the `*.xml` file with a new name in the `..\CustomTabs\Modeling` or `..\CustomTabs\Drawing` folder.

   Tab files have the file name extension `*.xml`. We recommend that you use the same name as for the tab. For example, `MyTab.xml`. The file name is not case sensitive.

   The tab is added to either the modeling or drawing mode ribbons, depending on the folder that it is located in. There can be several custom tab files in the same folder. They are added to the ribbon one after the other. If the same tab file exists in both the environment and firm folders, the firm version overrides the environment version.

NOTE To avoid file name conflicts, we recommend that administrators prefix all custom tab files with the company name, and that extension developers prefix all custom tab files with the name of the extension (for example, `MyExtension_TabName.xml`).

8. If the tab contains user-defined commands, copy the `UserDefined.xml` file from the `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UI\Commands` folder to the `\Commands` folder that you created in the firm folder or the system folder.
9. Restart Tekla Structures.

   The customized tab now appears at the end of the ribbon.

3.4 Distribute customized property pane layouts by using a project, firm, or environment folder

Administrators can distribute the customized property pane layouts to other users in the company by placing the `PropertyTemplates.xml` property pane layout file in the `PropertyRepository\Templates` folder in a project, firm, or environment folder.

For example, you can create company property pane layouts and save them in the firm folder. These property panes are available in the Tekla Structures user interface for all users who use the same firm folder.

Add a property pane layout file in a project, firm, or environment folder

1. In the Property pane editor, create the property pane layouts that you want to share.

   The property pane layouts are saved in the `PropertyTemplates.xml` file, in the `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UI\PropertyTemplates` folder.

   If you cannot find the folder, ensure that you are able to view the hidden files and folders on your computer.
2. In your company's project folder or firm folder, or in the system folder, create a folder named `PropertyRepository\Templates`.
3. Copy the `PropertyTemplates.xml` file to the `PropertyRepository\Templates` folder.
4. Restart Tekla Structures.

Search order of customized property pane layout files

The `PropertyTemplates.xml` file contains all the property pane layouts for different object types. The property pane layouts for different object types are treated separately. For example, Tekla Structures can read the property pane layout for steel beam from a different location than the property pane layout for steel column.

If different object types are defined in different folder locations, the definitions are combined. If the same object type is defined differently in different folder locations, the definition that is higher in the search order is used.

The property pane layout in the `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UI\PropertyTemplates\` folder has the highest priority, and after that Tekla Structures uses the default search order.

3.5 Distribute customized property pane settings by using a project, firm, or environment folder

Administrators can distribute customized property pane settings to other users in the company.

Place the `PropertyPaneSettings.xml` file in a folder called `\PropertyPane` in a project, firm, or environment folder.

1. Customize the property pane settings that you want to share.

   The property pane settings are saved in the `PropertyPaneSettings.xml` file, in the `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UI\PropertyPane\` folder.

   If you cannot find the folder, ensure that you are able to view the hidden files and folders on your computer.

2. Create a folder called `\PropertyPane` either in your company's project folder, firm folder, or in the system folder.
3. Copy the `PropertyPaneSettings.xml` file to the `\PropertyPane` folder.
4. Restart Tekla Structures.

   The file in `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UI\PropertyPane\` has the highest priority in

the search order, and after that Tekla Structures uses the default search order.

If the `PropertyPaneSettings.xml` file is placed in several different folder locations, Tekla Structures reads the settings from different folders and merges them.

3.6 Distribute customized toolbars by using a project, firm, or environment folder

Company administrators can distribute customized **Selecting**, **Snapping**, and **Snap override** toolbars to other users in the company.

Place the toolbar `.json` files in a folder called `\Toolbars` in a project, firm, or environment folder. For example, you can create company toolbars and save them in the firm folder. These toolbars are available in the Tekla Structures user interface for all users who use the same firm folder.

1. Customize the toolbars that you want to share.

   The toolbars are saved in corresponding `.json` files, in the `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\Toolbars` folder.

   If you cannot find the folder, ensure that you are able to view the hidden files and folders on your computer.
2. In your company's project folder or firm folder, or in the system folder, create a folder called `\Toolbars`.
3. Copy the toolbar `.json` files to the `\Toolbars` folder.
4. Restart Tekla Structures.

   Files in `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\Toolbars` have the highest priority in the search order. After that, Tekla Structures uses the default search order.

3.7 Files for configuring Tekla Structures

Tekla Structures contains a large number of files that affect the way that the app works. It is important to know where Tekla Structures stores information, the types of files that Tekla Structures contains, where the files are located, and how to use the files.

See also

Folder search order (page 45)

Check and change Tekla Structures file and folder locations in Directory browser (page 48)

Initialization files for start-up parameters and default settings (page 48)

Input files (.inp files) for configuring Tekla Structures (page 58)

Data files (.dat files) for configuring Tekla Structures (page 64)

Customize user interface text in message files (page 65)

Customize object properties and settings in property files (page 66)

Standard files (page 66)

Files related to catalogs (page 69)

Font files for customizing Tekla Structures (page 71)

Symbol files for drawings (page 72)

Files related to templates, reports and drawings (page 73)

Supported image file formats in Tekla Structures (page 75)

Log files about the operation of Tekla Structures (page 76)

Files and file name extensions in the Tekla Structures model folder (page 84)

File storing options and advanced options (page 105)

Folder search order

When you open a model, Tekla Structures searches for the associated files in specific folders in a specific order.

When Tekla Structures finds the first associated file, it stops searching. Any files with the same file name that are located later in the search order are ignored. The error log lists the names of the ignored files.

WARNING Do not store your customized files in the `system` folder. Tekla Structures replaces files in the `system` folder when you install a new version.

Many settings files and attribute files must be located either at the root level of the folder or in specific subfolders inside the main folder. For example:

- `.tpl` and `.rpt` files must be located at the root level of the model folder.
- `.OrgObjGrp` files must be located at the root level of the firm folder.
- Other attribute files can be located in the `attributes` subfolder inside the main folder.

The folder search order is:

Order	Folder	Defined by
1	Current model	The open model
2	Project	Advanced option . If property files are stored in user-defined subfolders under the project folder, Tekla Structures searches the subfolders for files in alphabetical order.
3	Firm	Advanced option . If property files are stored in user-defined subfolders under the firm folder, Tekla Structures searches the subfolders in alphabetical order.
4	Environment	Tekla Structures searches in the `\ \Environments\common` subfolder first, then in the subfolders for the environment and role that the user selects when they start Tekla Structures.
5	Role	The role that the user selects when they start Tekla Structures.
6	System	Advanced option You can specify more than one system folder to define specific settings for each role. Use the role options defined in the `env_<environment>.ini` file to point to the roles when specifying the system folders in the advanced option. Separate the options pointing to the roles with semicolons. For example: `set XS_SYSTEM=%XS_STEEL %;%XS_ENGINEERING %;%XS_CONTRACTOR%; %XS_GENERAL%;%XSDATADIR% \environments\common \system\`

For some specific files and file types, Tekla Structures searches in a different order. The exceptions are:

File or file type	Search order
Catalogs	Profile, bolt (page 314), material, and rebar (page 328) catalogs: 1. Model folder 2. Project folder (XS_PROJECT) 3. Firm folder (XS_FIRM) 4. Folder defined by the advanced option Shape catalog (page 294): 1. Model folder 2. Project folder (XS_PROJECT) 3. Firm folder (XS_FIRM) 4. System folder (XS_SYSTEM) 5. Folder defined by the advanced option Printer catalog: 1. Model folder 2. Project folder (XS_PROJECT) 3. Firm folder (XS_FIRM) 4. Folder defined by the advanced option
.dat files (page 64)	System folder (XS_SYSTEM)
objects.inp	1. Model folder 2. Project folder (XS_PROJECT) 3. Firm folder (XS_FIRM) 4. System folder (XS_SYSTEM) 5. inp folder ()
privileges.inp	1. Model folder 2. Project folder (XS_PROJECT) 3. Firm folder (XS_FIRM) 4. System folder (XS_SYSTEM) 5. inp folder ()
Reports (.rpt files)	1. Model folder 2. System folder (XS_SYSTEM)
Templates (page 149) (.tpl files)	1. Folder that contains your templates defined by the advanced option 2. Model folder

File or file type	Search order
	3. Project folder (`XS_PROJECT`) 4. Firm folder (`XS_FIRM`) 5. Environment-specific system templates defined by the advanced option 6. System folder (`XS_SYSTEM`)

Check and change Tekla Structures file and folder locations in Directory browser

Directory browser is a tool that helps you to find and modify the location of the various Tekla Structures files and folders, and customize user settings.

NOTE Generally, only administrators should change these settings. If you change them yourself, and you are sharing the same model with other users, and your settings differ from those of the project, you will have problems. Also, adding or modifying files in some of these folders may require administrator rights.

To locate files and folders, and customize your Tekla Structures settings:

1. Click the **Applications & components** button  in the side pane to open the **Applications & components** catalog.
2. Click the arrow next to **Applications** to open the applications list.
3. Double-click **Directory browser**.

   The **Directory browser** dialog box opens. You can check the most common folder paths, and customize the settings in your `user.ini` file, or in the user-specific or model-specific `options.ini` file.
4. Check the folder paths and change them if necessary by clicking the buttons on the left of the **Basic** tab.

   If you click the **Project** or **Firm** button and you have not set your firm and project folder, Tekla Structures will prompt you to do so and add the folder path definition to your `user.ini` file.
5. Check the settings in the `user.ini` and `options.ini` files and change them if necessary by clicking the buttons on the right of the **Basic** tab.
6. Go to the **Advanced** tab and define the folder paths for additional folders that you may need to access, such as custom components and macros.

Initialization files for start-up parameters and default settings

Initialization files (.ini files) define Tekla Structures start-up parameters and default settings.

Initialization files contain advanced options that are used for configuring Tekla Structures for different standards, and for your or your company's style of working. Advanced options determine the appearance and the behavior of Tekla Structures, such as the language used, the behavior of part marks on drawings, and the location of your model folder.

Tekla Structures automatically creates the necessary initialization files during installation. The number of initialization files that it creates depends on how many Tekla Structures environments you have installed.

See also

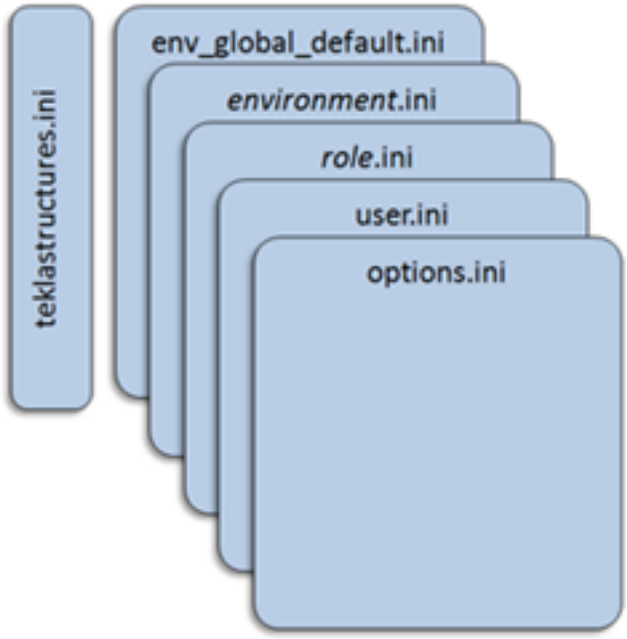
Create start-up shortcuts with customized initializations (page 346)

Typical initialization files (.ini files) and their reading order

Initialization files are read in a default order when Tekla Structures starts up. If different files contain the same settings, settings in files that are read later override settings in files that were read earlier.

To check which files were read when you started Tekla Structures and the order in which they were read, select **File menu** --> **Logs** --> **Session history log** .

This image shows the default reading order of the `.ini` files, excluding language-specific files and optional files:



This table lists the typical initialization files that are read when Tekla Structures starts up. The table lists the default location of each file. The exact location of the files might vary depending on the folder in which you install Tekla Structures.

Order	File	Description
1	`fonts_<lang>.ini`	**NOTE** Do not change these settings. These optional files contain fonts for languages that use special characters. These files are only needed if you use Tekla Structures in languages that use special characters. For example, the `fonts_jpn.ini` file is the fonts file for the Japanese language. These files are automatically installed to the `\bin` folder when Tekla Structures is installed. The default location is `..\Program Files\Tekla Structures\<version>\bin\`.
2	`teklastructures.ini`	**NOTE** Do not change these settings. This file in the contains basic system settings, such as the location of software and environment files, that are needed for Tekla Structures to run. This file is read when Tekla Structures starts up. This file is automatically installed to the `\bin` folder when Tekla Structures is installed. The default location is `..\Program Files\Tekla Structures\<version>\bin`
3	`lang_<lang>.ini`	**NOTE** Do not change these settings. This file contains the language settings for the Tekla Structures user interface. The language file that is read when Tekla Structures starts up depends on the language that you have selected in **File menu** --> **Settings** --> **Change language** in the previous Tekla Structures session. The languages that you have selected to install

Order	File	Description
		during the software installation determine which lang_<lang>.ini files are available. This file is automatically installed to the \bin folder when Tekla Structures is installed. The default location is ..\Program Files\Tekla Structures\<version>\bin\.
4	env_global_default.ini	**NOTE** Do not change these settings. This file contains the global default settings for all environments. You can use environment-specific env_<environment>.ini files to override the settings in this file. This file is automatically installed in the \Environments\common folder when you install the common environment installation package. The default location is ..\ProgramData\Trimble\Tekla Structures\<version>\Environments\common\
5	Any .ini files defined in the start-up shortcut or on the command line with -I <name>.ini	Usually none.
6	env_<environment>.ini	These files contain advanced options that have environment-specific settings. The settings in these files can override the settings in the env_global_default.ini file. The content of the env_<environment>.ini files is typically defined by your area office or reseller. The env_<environment>.ini file that is read depends on the environment that you select when Tekla Structures starts up. Each env_<environment>.ini file is installed in the \Environments\<environment> folder when you install an environment. The default location is ..\ProgramData\Trimble\Tekla

Order	File	Description
		Structures\<version>\Environments\<environment>. Which env_<environment>.ini files are installed on your computer depends on which environment packages you have installed. You can optionally define specific settings for roles in your environment and store these settings in role-specific folders under the ..\ProgramData\Trimble\Tekla Structures\<version>\Environments\<environment> folder. In the env_<environment>.ini file, each role has an option where you can add the paths that point to the folders in which you have stored the role settings. **NOTE** Do not change any other settings in the env_<environment>.ini file. For example, XS_STEEL (\Steel), XS_CONCRETE (\Concrete), XS_ENGINEERING (\Engineering) and XS_PRECAST (\Precast) each point to the folders that contain settings specific to that role. Example for the steel role: set XS_STEEL=%XSDATADIR%\environments\Steel\master_drawings\;%XSDATADIR%\environments\Steel\model_filters\;%XSDATADIR%\environments\Steel\model_settings\ For example, XS_GENERAL points to the \General folder that has content common for all roles and settings. When defining role settings in XS_SYSTEM, you use the role options defined in the env_<environment>.ini to point to the role-specific settings. You do not need to add the folder paths in XS_SYSTEM. They are defined in the env_<environment>.ini file.

Order	File	Description
7	role_<role>.ini	**NOTE** Do not change these settings. These files contain advanced options that have typical role-specific settings. The role_<role>.ini file that is read depends on the environment that you select when Tekla Structures starts up. These files are automatically installed when you install an environment. The default location is ..\ProgramData\Trimble\Tekla Structures\<version>\Environments\<environment>. Which role_<role>.ini files are installed on your computer depends on which environment packages you have installed. For example, the role_Engineer.ini file in the \Environments\uk folder contains all the settings for the Engineering role in the UK environment.
8	Any .ini files defined in the start-up shortcut or on the command line with -i <name>.ini	Usually none.
9	company.ini	This optional file is useful when you want to unify enterprise-level settings. This file is read only if the advanced option is set, from the folder specified with the advanced option. To use this file, you must create it. It is not automatically created by the installation.
10	user.ini	This file contains each user's personal settings. The user.ini file is created when you start Tekla Structures for the first time, and create and save a model using the current version. When you change settings in the **Advanced Options** dialog box, the settings are saved in the user.ini file. The default location for this file is C:\Users\<user_name>\AppData

Order	File	Description
		\Local\Trimble\Tekla Structures \<version>\UserSettings. Advanced options that are set in user.ini override advanced options that are set in other .ini files. For example, if the same advanced option is set in another .ini file, in a file in the environments sub-folder, and in the user.ini file, Tekla Structures uses the value in the user.ini file.
11	options.ini in the system folder	This file contains the system settings. The options.ini in the system folder is always read when Tekla Structures starts up. The folder for this file is specified with the advanced option .
12	options.ini in the firm folder	The options.ini files that contains firm-specific or project-specific model settings are saved in and read from user-defined locations specified with the advanced options and . They work in the specified way for the firm in question, or for the specified project if the model has been set up to read settings from these locations, and if the user has manually moved the options.ini file to these locations. An options.ini is created in the firm or project folder when you copy or move it there. Updating of model-specific and user-specific advanced options can only be done from the **Advanced Options** dialog box or options.ini located in model folder, not from the firm- or project-specific options.ini files. The options.ini in the firm or project folder is read when you start Tekla Structures or open the model.
13	options.ini in the project folder	
14	options.ini in the model folder	This file contains the model-specific settings. The options.ini file in the model folder is read when you open the model.

Order	File	Description
		NOTE Changing an advanced option value in an `.ini` file located outside the model folder does not affect existing models.

See also

Settings defined by advanced options (page 126)

Global default environment settings - env_global_default.ini

The `env_global_default.ini` file defines the global defaults for advanced options.

The file is read from `..\ProgramData\Trimble\Tekla Structures\<version>\environments\common\`.

WARNING Do not modify the `env_global_default.ini` file. If you need to modify some environment settings, copy the needed advanced options from this file to your user.ini (page 57) file and modify the settings there, or modify the settings in the **Advanced Options** dialog box.

For advanced options that are set according to your local standards, see the environment settings file env_<environment name>.ini (page 55) and the role settings file role_<role name>.ini (page 56). The local files override the advanced options set in `env_global_default.ini`.

If the advanced option in the `env_global_default.ini` file is preceded by `rem`, the software defaults are used and shown as the value. The outdated advanced options are listed at the end of the file.

Local environment settings - env_<environment>.ini

The `env_<environment>.ini` file contains advanced options that are set according to local standards and are different from the global defaults.

The file is read from the environment folder `..\ProgramData\Trimble\Tekla Structures\<version>\environments\`. The exact location might vary depending on your environment.

WARNING Do not modify the `env_<environment>.ini` file. If you need to modify some settings, copy the needed advanced options from this file to your

user.ini (page 57) file and modify the settings there, or modify the settings in the **Advanced Options** dialog box.

The global default environment settings file env_global_default.ini (page 55) contains a complete listing of advanced options. The local files override the advanced options set in `env_global_default.ini`.

Role settings - role_<role>.ini

The `role_<role>.ini` files contain all the advanced options that have typical role-specific settings.

The file is read from the environment folder `..\ProgramData\Trimble\Tekla Structures\<version>\environments\`. The exact location might vary depending on the environment.

WARNING Do not modify the `role_<role>.ini` file. If you need to modify some settings, copy the needed advanced options from this file to your user.ini (page 57) file and modify the settings there, or modify the settings in the **Advanced Options** dialog box.

The `role_<role>.ini` file contains advanced options that are set according to typical role requirements in your local area. These settings are different from your environment settings in env_<environment name>.ini (page 55). The global default environment settings file env_global_default.ini (page 55) contains a complete listing of advanced options. The advanced option settings in `role_<role>.ini` override the ones in `env_<environment>.ini`

Using roles for ribbon selection with subscription configurations

NOTE Ribbon selection with subscription configurations is primarily meant to be configured by Trimble and reseller localization personnel.

With subscriptions, roles can be used for controlling which ribbon is shown for a certain role. The role-specific .ini files in the environments (page 56), such as `role_Steel_Detailer.ini` or `role_Rebar_Detailer.ini`, contain the advanced options `XS_RIBBON_CONFIGURATION_DIAMOND`, `XS_RIBBON_CONFIGURATION_GRAPHITE`, and `XS_RIBBON_CONFIGURATION_CARBON`. These advanced options define the ribbons for the specific role.

The advanced options must point to the configuration identifiers (page 39) of the ribbon files, either to the configuration identifiers of the legacy on-premises license configurations, or to the configuration identifiers of the subscription configurations. It is not possible to make up new configuration identifiers.

If the advanced options are not set, Tekla Structures uses the default ribbons for each subscription configuration.

Example:

For the users who select the **Precast Concrete Detailing** role, you could have the following settings in the `role_Precast_Detailer.ini` file:

```
set XS_RIBBON_CONFIGURATION_CARBON=albl_up_Carbon
set XS_RIBBON_CONFIGURATION_GRAPHITE=albl_up_PC_Detailing
set XS_RIBBON_CONFIGURATION_DIAMOND=albl_up_PC_Detailing
```

For more examples, see your `role_<role>.ini` files used in your environment.

TIP Administrators who have their own environment and roles: for the role, such as timber detailer, you can create a folder for the ribbon files in `..\<environment>\Timber\Detailing\Ribbons`, for example. Place the customized ribbon files in the folder, and include the folder in the `XS_SYSTEM` path definition for that specific role.

Add an advanced option to the user.ini file

You can save your personal user settings in the `user.ini` file.

The `user.ini` file is located in the same location as the user-specific `options.bin` file, such as `..\Users\<user>\AppData\Local\Trimble \Tekla Structures\<version>\UserSettings`.

NOTE We recommend that you add only system-specific (page 126) advanced options to the `user.ini` file.

You can also add model-specific (page 126) advanced options, but the model-specific advanced options only affect new models that you create. This is because only the new advanced options that do not yet exist in `options_model.db` or `options_drawings.db` are taken into account. For more information, see Files storing options and advanced options.

Adding user-specific advanced options in `user.ini` might not work as desired as `options.bin` is loaded after `user.ini` and might override the value.

TIP When you are moving to a new version of Tekla Structures, you can use the Migration Wizard to automatically copy your `user.ini` file to the new version. The Migration Wizard appears once you start Tekla Structures for the first time after installation.

---

1. In Windows Explorer, right-click the `user.ini` file, select **Open with**, then select a text editor from the list of available programs.

2. On a new line, enter `set`, then a space, then the name of the advanced option followed by an equal sign, and then the value in a single line.

   Tekla Structures only reads lines in the initialization file that start with `set`.

   Example:

```
set %XS_DIR%=C:\TeklaStructures\2022
```

Possible values	Example
TRUE FALSE	set XS_DISABLE_WELD_PREP_SOLID=TRUE set XS_UNDERLINE_AFTER_POSITION_NUMBER_IN_HARDSTAMP=FALSE
1	set XS_SINGLE_CLOSE_DIMENSIONS=1
0	set XS_SINGLE_USE_WORKING_POINTS=0
string value	set XS_USER_DEFINED_BOLT_SYMBOL_TABLE=bolt_symbol_table.txt
switches	set XS_ASSEMBLY_FAMILY_POSITION_NUMBER_FORMAT_STRING=%%TPL:PROJECT.NUMBER%% Use two switches.

3. Save the changes to the `user.ini` file.
4. Restart Tekla Structures to apply the changes.

See also

Typical initialization files (.ini files) and their reading order (page 49)

Input files (`.inp` files) for configuring Tekla Structures

Tekla Structures uses input files (`.inp` files) for various purposes, such as to manage user-defined attributes and component dialog boxes, and to define how components work.

All input files have the extension `.inp`. You can use these input files for configuring Tekla Structures.

File	Description
analysis_design_config.inp	Contains settings for analysis and design.
fltprops.inp	Includes materials and dimensions of available flat bars (page 60).
mesh_database.inp	Contains definitions for reinforcement meshes.

File	Description
objects.inp	Used to manage user-defined attributes.
objects_rebar_set.inp	Used to manage user-defined attributes of rebar sets.
pop_mark_parts.inp	Contains settings for pop-marking.
privileges.inp	Used to control access rights.
profitab.inp	Contains available parametric profiles (page 247).
rebar_config.inp	Contains settings for reinforcement marks.
rebar_database.inp	Rebar catalog (page 328). Contains definitions for reinforcing bars and strands.
rebar_schedule_config.inp	Contains internal bending types of reinforcing bars and their mapping to area specific bending codes. **Rebar shape manager** is a more versatile way to define reinforcing bar bending shapes.

Tekla Structures also imports and exports rebar catalogs as .inp files.

See also

Properties of the objects.inp file (page 146)

Show plates as flat bars in drawings and reports

Tekla Structures can show plates as the equivalent flat bars for manufacturing. Tekla Structures shows the plates as flat bars in reports and drawings.

1. Set the advanced option XS_USE_FLAT_DESIGNATION to TRUE.
2. Indicate the prefix that you want to use for flat bars using the advanced option .

   For example, XS_FLAT_PREFIX=FLAT.

   TIP To prevent Tekla Structures from showing the profile in metric units in the US environment Imperial role, add the flat bar prefix to the profitab.inp (page 262) file as a parametric profile.

3. Set other advanced options related to plate work in the **Advanced options**dialog box as required:

XS_FLAT_TOLERANCE: Tekla Structures uses this value to check plate width to determine whether to convert it to a flat bar.

XS_FLAT_THICKNESS_TOLERANCE: Tekla Structures uses this value to check plate thickness to determine whether to convert it to a flat bar.

XS_CHECK_FLAT_LENGTH_ALSO: Tekla Structures checks plate length and plate width, and then compares those with the possible dimensions for flat bars in fltprops.inp.

4. Define materials, thickness, and width of available flat bars in the Fltprops.inp (page 60) file.

Define materials, thickness, and width of flat bars in the Fltprops.inp file

Use the `Fltprops.inp` file to define the materials, thickness, and width of the flat bars that are shown for plates in drawings and reports.

The `Fltprops.inp` file is located in the `\profil` folder in one of the folders under the environment folder `..\ProgramData\Trimble\Tekla Structures\<version>\Environments\`. The exact location might vary depending on your environment. In the default environment, `Fltprops.inp` is located in `..\ProgramData\Trimble\TeklaStructures\<version>\Environments\default\General\Shared`.

NOTE Copy the `Fltprops.inp` file to a model, project or firm folder, then modify the file in the new location.

The first row in the file contains flat bar material definitions enclosed in quotes " " and without spaces, followed by plate thicknesses. If you do not define a material, you can use all materials for all flat bars. The rows after that define the widths of available flat bars.

The units are millimeters.

Example

`Fltprops.inp` contains the following data:

```
5,6,"S235",8,10,"S275J0",10,15
40,45
50,55
60,65
70,75
100,110
200,220
```

With this data, Tekla Structures shows the following plates as flat bars in drawings and reports:

Plate	Material
5x40, 5x45, 6x50, 6x55	All materials

Plate	Material
8x60, 8x65, 10x70, 10x75	S235
10x100, 10x110, 15x200, 15x220	S275J0

Set advanced options related to plate work in the **Advanced options** dialog box as required:

XS_USE_FLAT_DESIGNATION: Tekla Structures uses flat bar designation, which means that it shows plates as the equivalent flat bars for manufacturing.

XS_FLAT_PREFIX: The flat bars get the prefix that is set as the value for this advanced option.

XS_FLAT_TOLERANCE: Tekla Structures uses this value to check plate width to determine whether to convert it to a flat bar.

XS_FLAT_THICKNESS_TOLERANCE: Tekla Structures uses this value to check plate thickness to determine whether to convert it to a flat bar.

XS_CHECK_FLAT_LENGTH_ALSO: When this advanced option is set to `TRUE`, Tekla Structures checks the plate length and plate width, and then compares those with the possible dimensions for flat bars in `fltprops.inp`.

Define unfolding parameters in the unfold_corner_ratios.inp file

The unfolding parameters define the location of the neutral axis when a profile is unfolded. The neutral axis is a line which runs along the length of a profile where stress and strain are equal to zero. Tekla Structures uses these parameters to create NC files and to display unfolded profiles in single-part drawings.

To define unfolding parameters, modify the `unfold_corner_ratios.inp` file, located in `..\ProgramData\Trimble\Tekla Structures\<version>\environments\common\system`, using a standard text editor. You can copy the `unfold_corner_ratios.inp` file to a model, project or firm folder and then modify the file in the new location as required. Tekla Structures searches for this file in the default search order.

After modifying the `unfold_corner_ratios.inp` file, restart Tekla Structures for the changes to take effect.

NOTE The settings in the `unfold_corner_ratios.inp` file have no effect in the following cases:

- If the advanced option XS_USE_OLD_POLYBEAM_LENGTH_CALCULATION is set to TRUE.
- If the advanced option XS_CALCULATE_POLYBEAM_LENGTH_ALONG_REFERENCE_LINE is set to TRUE. This only applies to polybeams with straight sections.

Unfold parameter properties

See below for an example of unfolding parameters in the `unfold_corner_ratios.inp` file and the descriptions of the parameters.

```
1 HE300A S235JR 0 180 2 0 1000 .7
```

Property	In the example	Description
Type	`1`	`1` is polybeams `2` is plates modeled as polybeams (for example, PLT) `3` is for parts which are not unfolded and follow the old polybeam calculation (for example, the line `3 L* *` disables unfolding of L profiles)
Profile	`HE300A`	You can also use wildcards with profile, for example, `HE300*`.
Material	`S235JR`	You can also use wildcards with material, for example, `S235*`.
Rotation / thickness min	`0`	For polybeams: the minimum angle when the profile is rotated around its longitudinal axis For plates: the minimum thickness of plate
Rotation / thickness max	`180`	For polybeams: the maximum angle when the profile is rotated around its longitudinal axis For plates: the maximum thickness of plate
Flag	`2`	This property defines what kind of parts are

Property	In the example	Description
		affected by the next two properties. `1` is sharp folds. Only polybeams with straight chamfers are affected. `2` is curved bends. Only polybeams with curved chamfers are affected.
Angle / radius min	`0`	For sharp folds: the minimum angle For curved bends: the minimum radius
Angle / radius max	`1000`	For sharp folds: the maximum angle For curved bends: the maximum radius Maximum radius is measured to the plane defined by the ratio, so it is not dependent on how the part is created (where the reference axis is located).
Ratio	`.7`	Defines how much the profile stretches or shrinks when unfolded. Ratio = (1 - the relative location of the neutral axis). If only the inner surface of the profile shrinks, the ratio is 1. If only the outer surface of the profile stretches, the ratio is 0. By default, the ratio is 0.5 for length calculation and 0.0 for bending radius calculation. Tekla Structures applies the unfolding ratio if the profile properties are within the range

Property	In the example	Description
		indicated by the minimum and maximum values.

Data files (`.dat` files) for configuring Tekla Structures

Data files (`.dat` files) contain information used by certain components and the **Rebar shape manager**.

Default data files are read from the environment's system folder. User-defined data files are stored in the model's `\attributes` folder.

WARNING These files affect the operation of components and the **Rebar shape manager**. Do not modify these files unless you are an administrator.

File	Description
`joints.dat`	Contains data used in **Handrailing (1024)** and **Stanchions (S76)** components. Used in the **Stanchion connection type** option.
`railings.dat`	Contains data used in **Handrailing (1024)**. Used in the **Stanchion connection type** option.
`steps.dat`	Contains the data for **Stairs (S82)** and **Stairs (S71)**. Used in the **Step profile** and **Catalogue step** options.
`std_flange_plates.dat`	Contains data for **Tapered column (S99)**. Used in the options: • **Outer flange profile** • **Inner flange profile** • **Top plate profile**
`std_stiffener_plates.dat`	Contains data used in **Tapered column (S99)**. Used in the **Horizontal stiffener profile** box.
`marketsize.dat`	Contains available market sizes for certain material grade. Can be used with `fMarketSize()` function in the custom component editor.
`import_macro_data_types.dat`	Contains the user-defined attributes that you can include in an input file in attribute import.
`RebarShapeManager.CustomProperties.dat`	Contains the custom properties, template attributes, and user-defined attributes that you can use in bending shape rules in the **Rebar shape manager**.

Customize user interface text in message files

Tekla Structures uses the information in the message files to show messages in the user interface.

Message files include texts in languages in which the Tekla Structures user interface is available. You can customize the texts in message files, such as the texts used in dialog boxes.

- Message files with the `.ail` extension are located in the folder `..\Tekla Structures\<version>\bin\messages`.
- Message files with the `.xml` extension are located in the folder `..\Tekla Structures\<version>\bin\messages\DotAppsStrings`.

Customize message files

You can customize the messages that Tekla Structures shows in the user interface.

1. Browse to the folder that contains the message file that you want to modify.
   - To modify an `.ail` message file, go to the `..\Tekla Structures\<version>\bin\messages` folder.
   - To modify an `.xml` message file, go to the `..\Tekla Structures\<version>\bin\messages\DotAppsStrings` folder.
2. Open the message file using a text editor, such as Microsoft Notepad.
3. Modify the messages as required.
4. Save the message file.

Example: customize a message file

This example shows how to modify a message that Tekla Structures uses for near side plates in drawings to show `(NS)` instead of `(N/S)`.

1. Go to the `..\Tekla Structures\<version>\messages` folder.
2. Open `by_number.ail` using a text editor.

   The `by_number.ail` file contains both prompts and default texts that Tekla Structures uses in drawings.
3. Browse to the following section:

```
string by_number_msg_no_675
 {
...
entry = ("enu", "(N/S)");
};
```

4. Change `(N/S)` to `(NS)` in the entry row.

5. Save and close the file.

Customize object properties and settings in property files

Property files contain the object properties and settings that are shown in the property pane or in the dialog boxes of model objects or drawing objects.

By default, Tekla Structures uses the standard property files when you apply commands. The default standard property files are read from the environment's system folder.

In addition to the default property files, you can define user-defined property files, and load these saved properties later when you create, for example, new model objects or drawing objects. Tekla Structures stores the saved, user-defined property files in the current model's `\attributes` folder.

Save a user-defined property file in the property pane

1. Enter a name for the property file in the field next to the  button.
2. Click  to save the property file.

Example

This example shows how to change the standard steel column properties so that you create a new type of column called `custom1`.

1. Open the steel column properties in the property pane.
2. Enter or modify the properties you want to save.
3. In the field next to the  button, enter a name for the new column properties. For example, `custom1`.
4. Click  .

   Tekla Structures saves the new `custom1.clm` property file in the current model's `\attributes` folder.

Save a user-defined property file in a dialog box

1. Enter a name for the property file in the field next to the **Save as** button.
2. Click **Save** or **Save as** to save the property file.

Standard files

Standard files are *property files* that Tekla Structures uses by default when you apply commands.

Standard properties are shown in the property pane of different model objects, such as beams, columns or plates, or in the dialog boxes of objects, such as drawing objects.

Standard files are named `standard.*`, where the symbol * is the file name extension. The file extension indicates the type of object that the properties in the standard file are used for. For example, the `standard.clm` file is used for the properties of steel columns.

User-defined attributes are saved with the `standard` files as `*.more` files. For example, the `standard.clm.more` file is used for user-defined attributes for steel columns.

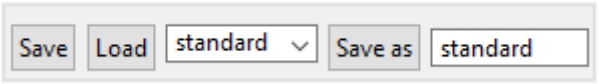
How properties are loaded from standard files

- In the property pane, the properties are loaded when you select the **standard** option in the upper part of the property pane. The properties are applied immediately.

  If the values that you loaded are different from the previous values, the property pane highlights the modified properties.

- In dialog boxes, the properties are loaded when you select the **standard** option in the list next to the **Load** button, and click the **Load** button.

Tekla Structures reads the default `standard` files from the environment's system folder.

If you want to load the default property settings from the `standard` files that are saved in the `attributes` folder, go to **Quick Launch** and use the **Load defaults** command.

Save a set of standard files

You can save a set of `standard` files in the `\attributes` folder for the current model.

After saving the `standard` files, you can copy them to the project folder or the firm folder to set up Tekla Structures to suit the way you work.

1. Go to **Quick Launch** and start typing `save defaults`.
2. Select **Save defaults** from the list.

Tekla Structures saves the following list of `standard` and `*.more` files in the `..\TeklaStructuresModels\<model_name>\attributes` folder:

File	Property
`standard.bpl` `standard.bpl.more`	Bent plate properties
`standard.clm` `standard.clm.more`	Steel column properties
`standard.cpl` `standard.cpl.more`	Contour plate properties
`standard.crs` `standard.crs.more`	Orthogonal beam properties
`standard.dia` `standard.dia.more`	Twin profile properties
`standard.fms` `standard.fms.more`	Plotting frames
`standard.fpl` `standard.fpl.more`	Folded plate properties
`standard.ipc` `standard.ipc.more`	Concrete item properties
`standard.ips` `standard.ips.more`	Item properties
`standard.ler` `standard.ler.more`	Layer properties
`standard.mvi` `standard.mvi.more`	Model view properties
`standard.num` `standard.num.more`	Numbering setup
`standard.prf` `standard.prf.more`	Project properties
`standard.prt` `standard.prt.more`	Steel beam properties
`standard.scr` `standard.scr.more`	Bolt properties

File	Property
standard.wld standard.wld.more	Weld properties

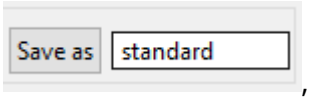
You can now copy the standard files to the project folder or the firm folder.

Create user-defined standard files

You can create your own standard files.

Tekla Structures saves the user-defined standard files in the \attributes folder for the current model.

1. Open the property pane or a dialog box for which you want to save the properties as a standard file.
2. Modify the properties.
3. Save the properties in one of these ways:
   - In the property pane: enter standard as the name 

, then click  .
   - In a dialog box: in the box next to the **Save as** button, enter standard as the name 

, then click **Save as**.

Tekla Structures saves the standard file and the related *.more file in the current model's \attributes folder. If a standard file with the same file name extension exists in the in the \attributes folder, Tekla Structures overwrites the previous file.

When you want to load the standard file, select it from the list of the property files in the property pane or in a dialog box.

Alternatively, to load the default property settings from the standard files that are saved in the attributes folder, go to **Quick Launch** and use the **Load defaults** command.

Files related to catalogs

Tekla Structures uses ASCII and binary files to manage profile, material, reinforcement, bolt, and bolt assembly catalogs.

Each environment has its own folder where the files related to different catalogs are stored. For example, ..\Environments\uk\general\profil\ contains the files for managing catalog files used in the United Kingdom. The

exact file location might vary depending on the folder structure of your environment files.

File type	File name	Used for	Default location
.inp	profitab.inp	Defines the names that you can use for parametric profiles.	..\ProgramData\Trimble\Tekla Structures\<version>\Environments\<environment>\profil
	rebar_database.inp	The rebar catalog.	..\ProgramData\Trimble\Tekla Structures\<version>\Environments\<environment>\profil
	mesh_database.inp	The reinforcement mesh catalog.	..\ProgramData\Trimble\Tekla Structures\<version>\Environments\<environment>\profil
	You can define the file name while exporting.	Created when you export rebar catalogs.	You can define the folder while exporting.
.cnv	matexp_<software>.cnv	Converting material names when transferring model information using links. For example, converts S235JR to FE360B for DSTV.	..\ProgramData\Trimble\Tekla Structures\<version>\Environments\<environment>\profil
	prfexp_<software>.cnv	Converting profile names when transferring model information using links. For example, converts HEA100 to HE100A for DSTV.	..\ProgramData\Trimble\Tekla Structures\<version>\Environments\<environment>\profil
.clb	For example, RU_CF.clb	Contains the definitions of parametric profiles used in profitab.inp.	..\ProgramData\Trimble\Tekla Structures\<version>

File type	File name	Used for	Default location
			\Environments \common\inp
.lis	You can define the file name while exporting.	Created when you export bolt, profile and material catalogs.	You can define the folder while exporting.
.db	assdb.db	The bolt assembly catalog.	..\ProgramData \Trimble\Tekla Structures \<version> \Environments \<environment> \profil
	screwdb.db	The bolt catalog.	..\ProgramData \Trimble\Tekla Structures \<version> \Environments \<environment> \profil
.bin	profdb.bin	The profile catalog.	..\ProgramData \Trimble\Tekla Structures \<version> \Environments \<environment> \profil
	matdb.bin	The material catalog.	..\ProgramData \Trimble\Tekla Structures \<version> \Environments \<environment> \profil

See also

Customize the profile catalog (page 234)

Customize the material catalog (page 226)

Customize the bolt catalog (page 314)

Customize the rebar catalog (page 328)

Font files for customizing Tekla Structures

You can define the location of font files with the advanced option `DXK_FONTPATH` in the `teklastructures.ini` or your environment initialization file.

For example, you can use fonts available in the folder `..\ProgramData\Trimble\Tekla Structures\<version>\Environments\common\fonts`.

This folder includes the following Tekla Structures system fonts:

- `fixfont.fon`
- `romco.fon`
- `romsim.fon`
- `romsim8.fon`

NOTE The Cyrillic fonts `GOST 2.304-81 type A.ttf` and `GOST 2.304-81 type B.ttf` are located in the `C:\Windows\Fonts` folder, not the `..\ProgramData\Trimble\Tekla Structures\<version>\Environments\common\fonts` folder.

Fonts are converted using font conversion files that are available in the same folder:

File	Used for
`template_fonts.cnv`	Converting Tekla Structures system fonts, such as Template Editor fonts, to Windows fonts in DWG/DXF export.
`dxf_fonts.cnv`	Converting True Type fonts to the SHX font format that is understood by AutoCAD in the old DWG/DXF export.

See also

Initialization files for start-up parameters and default settings (page 48)

Symbol files for drawings

Symbols are used in various places in drawings, for example, as separate objects, and in marks.

You can create symbols with the Symbol Editor. The file name extension is `.sym`. You can also use symbols in `.dwg` format.

By default, Tekla Structures stores symbol files in the folder `..\Environments\common\symbols`.

Files related to templates, reports and drawings

Tekla Structures has several files that relate to templates, reports, drawings and printing.

File or file type	Description	Location
`.rpt`	Report templates (page 149) created with the Template Editor	System folders defined for the advanced option `XS_SYSTEM`
`.tpl`	Drawing templates (page 149) created with the Template Editor	Template folders defined for the advanced option `XS_TEMPLATE_DIRECTORY`
`.lay`	Layout definitions created with the **Drawings & reports** --> **Drawing properties** --> **Drawing layout editor** command.	The `\attributes` sub-folder in the model folder
`plotdev.bin`	Printer device definitions created with the **Printer Catalog** printer instances.	System folders defined with the advanced option `XS_SYSTEM`
`xdproc`	**Master Drawing Catalog** rule set	System folders defined with the advanced option `XS_SYSTEM`
`xdproc.master`	**Master Drawing Catalog** master drawing file	System folders defined with the advanced option `XS_SYSTEM`
`xdproc.master.png`	**Master Drawing Catalog** sample (preview) image files	System folders defined with the advanced option `XS_SYSTEM`
`xdproc.png`	**Master Drawing Catalog** thumbnail image files	System folders defined with the advanced option `XS_SYSTEM`

For more information about the folder search order, see Folder search order (page 45).

The default drawing, report, and template files are read from the system folders defined with the `XS_SYSTEM` advanced option or from the `XS_TEMPLATE_DIRECTORY` folders, but user-defined files are stored in the `\attributes` sub-folder in the model folder.

DWG reference model plug-in configuration settings

The settings in the DWG reference model plug-in configuration file `dwgplugin.config` are described below.

NOTE The advanced settings in `dwgplugin.config` do not normally need to be changed, but in some scenarios, things like very large radius arcs can end up with the generated straight line segments not small enough for the user's needs, and adjusting these settings can help. The `dwgplugin.config` file is located in the `..\bin\plugins\referenceplugins\dwg\` folder, and you might need administrator rights to access the file.

Example of the configuration file:

```
<?xml version="1.0" encoding="UTF-8"?>
<tsplugin version="1" inproc="false" extensions=".dwg|.dxf">
  <hostenv>
  </hostenv>
  <configuration>
  </configuration>
  <settings>
    <acistesselation>15</acistesselation> <!-- degrees -->
    <largecircledelimiter>10000</largecircledelimiter> <!-- in dwg units
-->
    <linesinlargecircle>256</linesinlargecircle>
    <linesinsmallcircle>32</linesinsmallcircle>
    <externalGUID>spatialHash</externalGUID>
    <!-- Single shapes larger than this will be excluded. Units are in
model units. Set to 0 to disable. -->
    <maximumsize>1000000</maximumsize>
  </settings>
</tsplugin>
```

The settings used in the configuration file are described below:

Setting	Description
`acistessellation`	This setting may or may not do anything depending on the plug-in version - in earlier versions it configures the tessellation density of the solids.
`largecircledelimiter`	Defines the radius of a circle that is then considered to be a large circle w.r.t. the parameters LinesInSmallCircle and LinesInLargeCircle. A circle radius that is equal to or greater than this value will be treated as a large circle. This value is in dwg units.
`LinesInSmallCircle`	Sets the number of tessellation lines in the circle (with a 'small' radius) that an arc represents. This is then used when tessellating the arc into straight line segments. Valid range is 3 to 10000.

Setting	Description
LinesInLargeCircle	Sets the number of tessellation lines in the circle (with a 'large' radius) that an arc represents. This is then used when tessellating the arc into straight line segments. Valid range is 3 to 10000.
externalGUID	Configures the style of the id attached to parts. This parameter should not be changed.
maximumsize	Single shapes larger than the value you specify will be excluded. Units are in model units. Set to 0 to disable.

Supported image file formats in Tekla Structures

You can use image files in many places in Tekla Structures.

You can use image files in:

- Templates in drawings
- Drawing snapshots
- Component dialog boxes and thumbnails
- Drawing line types
- The surface treatment dialog box
- The **Master Drawing Catalog** for thumbnails and sample images
- Profile properties dialog boxes

These image file formats are supported in Tekla Structures:

Used in	Supported image formats
Templates	• bmp • gif • grd • jpg • ppm • pgm • rle • tiff • xkrl

Used in	Supported image formats
Drawing snapshots	`png`
Thumbnail and sample images for the **Master Drawing Catalog**	`png`
Other uses	`bmp`

See also

Add images in a template (page 165)

Log files about the operation of Tekla Structures

Tekla Structures writes information about the operation of Tekla Structures to log files when you perform some actions, such as numbering a model or saving a model.

File	Description
`analysis.log`	Tekla Structures stores information in this file when you run the analysis. The file also contains information about the errors that occurred during load distribution. This log file is saved in the current model folder.
`check_database.log`	Tekla Structures stores information in this file when you run the **Repair** command in **File menu** --> **Diagnose & repair** --> **Model** . This log file is saved in the current model folder.
`ClashCheck.log`	Contains clashes found in the most recent clash check. This log file is saved in the current model folder.
`ClientLog_cat.txt` `ClientLog_dog.txt`	The client log files contain diagnostic information and error messages about the Tekla Model Sharing sharing service, such as connecting to the sharing service or the status of the sharing service. The client log files are saved in the `\Users\<user>\AppData\Local\Tekla DataSharing` folder by default. There are two client log files with a maximum size of 1 megabyte each, so that the information does not use too much disk space. When the maximum file size is reached in one file, log writing changes to the other file. Each time that the active client log file changes, any information previously saved in the current log file is cleared before any new log information is written to the log file.

File	Description
ComponentCatalog_<user>.log	Contains troubleshooting information related to the **Applications & components** catalog and any errors that have occurred in the **Applications & components** catalog. For example, errors in catalog definition files are stored in the ComponentCatalog_<user>.log file. This log file is saved in the \logs folder under the current model folder. A limited number of older log messages related to the **Applications & components** catalog are archived and saved in the ComponentCatalog_<user>.bak.log file. This file contains approximately 1024 KB of data.
conflict.log	Contains conflicts that have occurred when more than a one user has modified an object in multi-user mode. This log file is saved in the current model folder.
DocumentManager_<user>.log	Contains troubleshooting information related to the **Document manager**, and any errors that have occurred in the **Document manager**. This log file is saved in the \logs folder under the current model folder. A limited number of older log messages related to the **Document manager** are archived and saved in the DocumentManager_<user>.bak.log file. This file contains approximately 256 KB of data.
DPMPrinter_<user>.log	Contains troubleshooting information related to printing, and any errors that have occurred in printing drawings or reports to a printer, a plot file, or a PDF file. This log file is saved in the \logs folder under the current model folder. A limited number of older log messages related to printing are archived and saved in the DPMPrinter2_ <user>.log file. This file contains approximately 1024 KB of data.
drawing_cloning.log	Contains information about cloned drawings. This log file is saved in the current model folder.
drawing_history.log	Contains information about drawing history. Use the advanced option to define the contents of the file. This log file is saved in the current model folder.
dstv_nc.log	Each time you create NC files, Tekla Structures stores information in this file about the processed

File	Description
	assemblies. This log file is saved in the current model folder.
error_<user>_<YYYYMMDD>_<HHMMSS>.log	Each time an error occurs in Tekla Structures, the error is saved in an error log file. Error log files contain the description of errors that have occurred at a particular time. For example, if an error has occurred on April 1, 2019 at 9:15:30 AM, the name of the related error log file is error_<user>_20190401_091530.log. This log file is saved in the \logs folder under the current model folder.
filetranerror.log	Used only for cold rolled components, such as Albion, Ayrshire, and Hispan. If the **File Transfer** components do not work as expected, Tekla Structures stores error messages in this file. This log file is saved in the current model folder.
modelsharing.log	Contains the sharing operations that have been performed in Tekla Model Sharing. For example, opening a shared model and reading in the changes made by other users are stored in the modelsharing.log file. This log file is saved in the \logs folder under the current model folder.
numberinghistory.txt	Contains full details of each numbering session carried out on the model. Each session is in a different block of the file. This log file is saved in the current model folder.
PublishToTrimbleConnect.log	Contains upload information and the errors that have occurred when uploading the Tekla Structures model to a linked Trimble Connect project as a .tekla file. This log file is saved in the \logs folder under the current model folder.
save_history.log	Tekla Structures stores information in this file each time you save a model. This log file is saved in the current model folder.
sharingfacade.log	Contains the essential information from the client log files when an error has occurred in the Tekla Model Sharing sharing service. This log file is saved in the \logs folder under the current model folder.
TeklaStructures_<user>.log	Contains information about the entire Tekla Structures session from opening the model to closing it. The file contains, for example, errors and information about which catalogs were used. This temporary log file is saved in the

File	Description
	`\TeklaStructuresModels` folder, and is removed when you close Tekla Structures.
`UserFeedbackLog.txt`	Contains usage data about how you use Tekla Structures. This log file is saved in the `\TeklaStructuresModels` folder. The `UserFeedbackLog.txt` log file is always opened with the default text editor, unlike other log files which can be opened through the Tekla Structures log viewer. The option to change between the viewers does not work for the `UserFeedbackLog.txt` file.
`wizard.log`	Tekla Structures stores information in this file when you run a drawing rule set (wizard) file. The file contains, for example, errors and the number of drawings created. This log file is saved in the current model folder.

View a log file

You can view most log files in the Tekla Structures log viewer, or in the application that has been associated with the file type, such as Microsoft Notepad.

If the log file contains information about parts or assemblies, you can check the parts or assemblies in the model. In the log file, select a row that contains a part or an assembly.

Parts and assemblies have the prefix `guid`.

Tekla Structures highlights the part in the model. If there are several parts or assemblies on a row and you select that row, Tekla Structures highlights all the parts in the model. You can also select parts on different rows.

TIP You can open the right-click menu for a part or an assembly from the log file by right-clicking a row that contains a part or an assembly. Tekla Structures shows the same menu as when you right-click a part or an assembly in the model.

---

1. Open the model for which you want view the log history.
2. On the **File** menu, click **Logs**, then select a log file.
   - **Clash Check history log** (`ClashCheck.log`)
   - **Session history log** (`TeklaStructures_<user>.log`)
   - **Numbering history log** (`numberinghistory.txt`)
   - **Saving history log** (`save_history.log`)

- **Drawing history log** (`drawing_history.log`)
- **Analysis history log** (`analysis.log`)
- **Usage data log** (`UserFeedbackLog.txt`)

3. View the log file in one of the following ways:
   - To view the log file in the log viewer, in **File** --> **Logs** select **View with Tekla Structures log viewer**.

     NOTE You cannot view the `UserFeedbackLog.txt` log file in the Tekla Structures log viewer.

   - To view the log file in the application associated with the file type, **File** --> **Logs** select **View with default application**.

Change the name and location of session history log file

You can change the name and location of the session history log file (`TeklaStructures_<user>.log`).

If someone else manages your installation of Tekla Structures, do not change these settings unless you are instructed to do so.

Windows username and the `.log` file extension are always added after the customizable part of the name.

1. Open a suitable initialization file (page 49) for editing.

   For example, `user.ini` or `company.ini`.

2. To change the **name** of the session history log file, add the following line to the initialization file:

   ```
   set XS_LOG_FILE_NAME=<name of the file>
   ```

   For example:

   ```
   set XS_LOG_FILE_NAME=sessionhistory
   ```

   If the Windows user name is "achilles", this example would result in a log file named `sessionhistory_achilles.log`.

   The default name is `TeklaStructures_<user>.log`.

3. To change the **location** of the session history log file, add the following line to the initialization file:

   ```
   set XS_LOGPATH=<location of the file>
   ```

   If there is no other location set, the file is stored in the parent folder for model folders (by default `c:\TeklaStructuresModels`).

4. Save the initialization file.
5. Restart Tekla Structures for the changes to take effect.

See also

- XS_LOG_FILE_NAME
- XS_LOGPATH

Numbering history log file

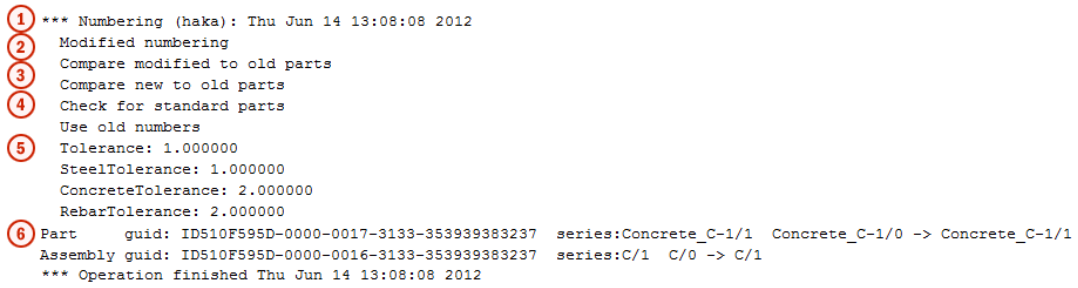
The `numberinghistory.txt` log file contains full details of each numbering session carried out on the model. Each numbering session is in a different block of the file.

If one numbering series overlaps another, the errors are written to the log file.

NOTE If you remove or delete the `numberinghistory.txt` log file, Tekla Structures generates a new file with the same name the next time you run numbering. The new file does not contain a history of previous numbering sessions.

Example

This example shows the contents of a `numberinghistory.txt` log file.



1	User name, date and time of the numbering.
2	Numbering method. • `Modified numbering` is displayed when you run the **Number modified objects** command. • `Modified numbering for selected series` is displayed when you run the **Number series of selected objects** command. • `Diagnose & Repair Numbering: All` is displayed when you run the **Diagnose & repair numbering: All** command. • `Diagnose & Repair Numbering: Series of selected objects` is displayed when you run the **Diagnose & repair numbering: Series of selected objects** command. • `Renumber all` is displayed when you select the **Renumber all** option in the **Numbering Setup** dialog box.
3	Some **Compare** options set in the **Numbering Setup** dialog box are displayed in the `numbering.history` log file only if they are set differently than the default value: • `Compare modified to old parts`

	• `Compare new to old part` • `No holes comparing` • `No part name comparing` • `Beam orientation` • `Column orientation` Some **Compare** options are not displayed at all: • **Reinforcing bars** • **Embedded objects** • **Surface treatment**
4	Numbering options. • `Use old numbers` is displayed only when you have selected the **Re-use old numbers** option in the **Numbering Setup** dialog box. • `Check for standard parts` is displayed only when you have selected the **Check for standard parts** option in the **Numbering Setup** dialog box.
5	Tolerances are set in the **Numbering Setup** dialog box.
6	Changes in the position numbers and in the numbering series during one numbering session.

See also

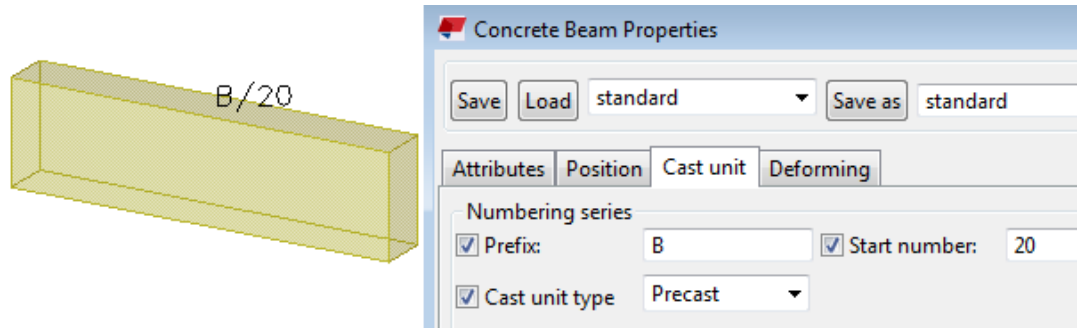
•

Numbering series in the numbering history log file

Tekla Structures lists information about the numbered parts and assemblies in the `numberinghistory.txt` log file.

Example 1

The `numberinghistory.txt` log after one concrete beam **B/20** has been created and numbered:

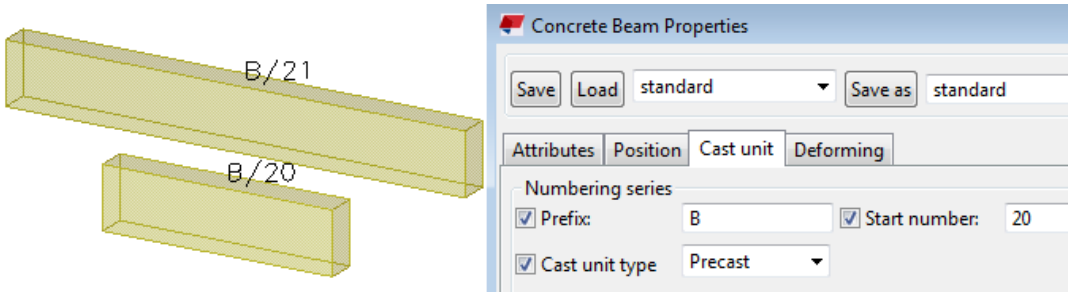



```
1 Part     guid: ID510F595D-0000-0030-3133-353939383335  series:Concrete_B-20/1  Concrete_B-20/0 -> Concrete_B-20/1
2 Assembly guid: ID510F595D-0000-002F-3133-353939383335  series:B/20  B/0 -> B/20
```

1	Part position number. • The part with the GUID `ID510F595D-0000-0030-3133-353939383335` is a part of the numbering series `Concrete_B-20/1`. • The part becomes the first part in the numbering series: `Concrete_B-20/0 -> Concrete_B-20/1`.
2	Assembly position number. • The assembly ID of the part is `ID510F595D-0000-002F-3133-353939383335`. • The part belongs to the `B/20` assembly numbering series, which is also the cast unit numbering series. • The part gets the assembly position number: `B/20: B/0 -> B/20`.

Example 2

The `numberinghistory.txt` log after another concrete beam **B/21** has been created and numbered:




```
1 Part     guid: ID510F595D-0000-0030-3133-353939383335  series:Concrete_B-20/1  Concrete_B-20/0 -> Concrete_B-20/2
2 Assembly guid: ID510F595D-0000-002F-3133-353939383335  series:B/20  B/0 -> B/21
```

1	Part position number of the new part. • The part with the ID `ID510F595D-0000-0030-3133-353939383335` is part of the numbering series `Concrete_B-20/1`. • The part becomes the second part in the numbering series: `Concrete_B-20/0 -> Concrete_B-20/2`.
2	Assembly position number. • The assembly ID of the part is `ID510F595D-0000-002F-3133-353939383335`. • The part belongs to the `B/20` assembly numbering series, which is also the cast unit numbering series.

	• The part gets the assembly position number: `B/20 B/0 -> B/21`.

Files and file name extensions in the Tekla Structures model folder

These tables list the folders, files and file name extensions of files located in a Tekla Structures model folder.

Files in the Tekla Structures model folder

File or file name extension	Description
`.db1`	Model database
`.db2`	Numbering database
`environment.db`	Database for user-defined attribute definitions
`xslib.db1`	Contains information about user-defined connections and details, and default component descriptions.
`.idrm`	Mapping file, which handles IDs. **NOTE** Do not modify this file.
`xslib.db2`	Contains numbering information.
`options_model.db` and `options_drawings.db`	Contain values for model-specific options from the **Options** dialog box and values for model-specific advanced options from the **Advanced Options** dialog box. When a model is created, Tekla Structures reads model-specific options and advanced options values from the `standard.opt` file and `.ini` files in the environment folders and saves them in these two databases.
`history.db`	Model history database.
`xsdb.xs`	This file is used to show the name of the model in the **Open** dialog box.
`xs_user.<username>`	Contains interface settings specified by the user. This file contains settings for many of the options in the **Options** dialog box and the settings for the icons on the **Selecting** and **Snapping** toolbars.

File or file name extension	Description
	Each time a model is saved, an `xs_user.<username>` file is created or updated. These settings are user-specific. If the `xs_user.<username>` file is not found in the model folder when you open the model, Tekla Structures searches for the `xs_user.default` file in the following folder search order: 1. Model folder 2. `model\attributes` 3. Project folder 4. `XS_FIRM\attributes` 5. System folder If this file is not found, the default settings for Tekla Structures default settings are used.
`drawing_user.<username>`	Contains information about which snap switches are switched on or off in the drawing mode. This file is user-specific. **NOTE** Do not modify this file.
`save_history.log`	Each time the model is saved, Tekla Structures stores the information in this file. The file includes the time and date that the file was saved, and information about any conflicts during saving.
`notification_report.xsr`	This file is used to show a notification report of assignments when you open a model.
`TeklaStructuresModel.xml`	Contains a copy of basic details about the Tekla Structures model, such as the model name, the version it was last saved with, and the Tekla Structures environment that was used. Tekla Structures overwrites the details in this file each time the model is saved. The model details that you see when you select a model on the startup screen are read from this file. The file can also be used as an information source for external tools, such as scripts.
`dotlog.txt`	A log file that contains information about Tekla Open API application use.
`.locked`	A temporary file that locks the files in the model folder to prevent modifications while the model is in use.

File or file name extension	Description
.bak	A backup copy of a file with a corresponding name. For example, the <modelname>.db1.bak file is the backup copy of the model database file <modelname>.db1.
assert.txt	A log file that contains information about assertion errors.
ClashCheck.txt	A log file that contains information about clashes found in the most recent clash check, and the date and time of the clash check.
ClashCheck.history	A file that contains information about clashes found in all past clash checks, and the dates and times of the clash checks.
wizard.txt	Tekla Structures stores information in this file when you run a drawing rule set (wizard) file. The file contains information such as errors, the number of drawings created, and information about which commands were used.
.lis	Export files for catalogs. You can export catalogs and import them to different Tekla Structures models as .lis files. These catalogs include profile, material, and bolt catalogs.
.tsc	Export files for shapes. You can export shapes and import them to different Tekla Structures models as .tsc files.
.This_is_multiuser_model	Contains information about the PC that is running the Tekla Structures multi-user server. **NOTE** In normal circumstances, do not alter or delete this file. If you move the model to a different server, you should delete this file. Tekla Structures generates a new file for the new server.
ComponentCatalog.xml	Contains the model level catalog definitions of the **Applications & components** catalog.
<user>_ComponentCatalogUserSettings.xml	Lists the recently used applications and components, and their location in the **Applications & components** catalog structure.
Worktypes.xml	Lists available task types. This file is created when you start the **Task Manager**.

File or file name extension	Description
`WorkTypeProperties.xml`	Lists allowed property types and their units.
`.tmp`	Stores temporary data.
`.cnv`	Maps Tekla Structures profile and material names with names used in other software.
`.colorset`	This file is created when you export a color set from the **Organizer**.

Files in the \Analysis folder

File or file name extension	Description
`.ifc`	The analysis model exported in IFC format.
`.stp`	The analysis model exported in CIS/2 format.
`.map`	A file used for debugging analysis models.
`analysis_results.db5`	Database that contains saved analysis results for all load combinations.
`.db6`	Analysis model database.

Files in the \attributes folder

File or file name extension	Description
`.rmcs`	Comparison set files used in reference model change detection.
`.rmct`	Property set comparison tolerance setting files used in reference model change detection.
`.rop`	Reference object properties
`.rop.more`	Reference object user-defined attribute properties
`.m10000017`	FabTrol XML import properties
`.m10000015`	Import attribute properties
`.ncf`	NC file properties
`.ExportIFC.MainDialog`	IFC export properties
`.m440000004`	3D DWG/DXF export properties
`.m440000003`	3D DGN export properties
`.m1000004`	FEM export properties
`.m10000011`	CIS analysis model export properties

File or file name extension	Description
.m10000026	CIS manufacturing model export properties
.m1000007	CAD export properties
.m10000016	Cover sheet export properties
.SObjGrp	Model selection filter properties
.VObjGrp	Model view filter properties
.OrgObjGrp	Organizer filter properties
.PObjGrp	Object group filter properties
.grd	Rectangular grid properties
.grd.more	Rectangular grid user-defined attribute properties
.rgrd	Radial grid properties
.rgrd.more	Radial grid user-defined attribute properties
.grdp	Grid line properties
.grdp.more	Grid line user-defined attribute properties
.cnl	Construction line properties
.cncrl	Construction circle properties
.cnarc	Construction arc properties
.cnplycrv	Construction polycurve properties
.mvi	Model view properties that you have saved for the model. The default 3D, part, component, custom component, assembly, and cast unit view settings files must be saved with the names used in common environment: 3D view: basic_view 3D part view: part_basic_view Part front view: part_front_view Part top view: part_top_view Part end view: part_end_view Part perspective view: part_persp_view 3D component view: component_basic_view Component front view: component_front_view Component top view: component_top_view Component end view: component_end_view Component perspective view: component_persp_view

File or file name extension	Description
	Custom component front view: custom_object_editor_front_view Custom component top view: custom_object_editor_top_view Custom component end view: custom_object_editor_end_view Custom component perspective view: custom_object_editor_perspective_view 3D assembly or cast unit view: assembly_basic_view Assembly or cast unit front view: assembly_front_view Assembly or cast unit top view: assembly_top_view Assembly or cast unit end view: assembly_end_view Assembly or cast unit back view: assembly_back_view Assembly or cast unit bottom view: assembly_bottom_view Assembly or cast unit perspective view: assembly_persp_view
.gvi	Saved properties for creating views along grid lines
.rep	Object representation properties
.clm	Steel column properties
.clm.more	Steel column user-defined attribute properties
.prt	Steel beam properties
.prt.more	Steel beam user-defined attribute properties
.sb	Steel spiral beam properties
.sb.more	Steel spiral beam user-defined attribute properties
.crs	Orthogonal beam properties
.crs.more	Orthogonal beam user-defined attribute properties
.dia	Twin profile properties
.dia.more	Twin profile user-defined attribute properties
.cpl	Contour plate properties
.cpl.more	Contour plate user-defined attribute properties
.blp	Bent plate properties
.blp.more	Bent plate user-defined attribute properties

File or file name extension	Description
.lpl	Lofted plate properties
.lpl.more	Lofted plate user-defined attribute properties
.ips	Item properties
.ips.more	Item user-defined attribute properties
.cpf	Pad footing properties
.cpf.more	Pad footing user-defined attribute properties
.csf	Strip footing properties
.csf.more	Strip footing user-defined attribute properties
.ccl	Concrete column properties
.ccl.more	Concrete column user-defined attribute properties
.cbm	Concrete beam or concrete polybeam properties
.cbm.more	Concrete beam or concrete polybeam user-defined attribute properties
.csb	Concrete spiral beam properties
.csb.more	Concrete spiral beam user-defined attribute properties
.csl	Concrete slab properties
.csl.more	Concrete slab user-defined attribute properties
.cpn	Concrete panel properties
.cpn.more	Concrete panel user-defined attribute properties
.lsl	Concrete lofted slab properties
.lsl	Concrete lofted slab user-defined attribute properties
.ipc	Concrete item properties
.ipc.more	Concrete item user-defined attribute properties
.rbr	Reinforcing bar properties
.rbr.more	Reinforcing bar user-defined attribute properties
.rbg	Reinforcing bar group properties
.rbg.more	Reinforcing bar group user-defined attribute properties
.rcu .rcu.more	Curved reinforcing bar group properties and user-defined attributes
.rci .rci.more	Circular reinforcing bar group properties and user-defined attributes
.rbm	Reinforcement mesh properties

File or file name extension	Description
.rbm.more	Reinforcement mesh user-defined attribute properties
.rbs	Reinforcement strand pattern properties
.rbs.more	Reinforcement strand pattern user-defined attribute properties
.rsp	Reinforcement splice properties
.rsp.more	Reinforcement splice user-defined attribute properties
.rst	Rebar set properties
.rst.more	Rebar set user-defined attribute properties
.rst_ls	Rebar set leg surface properties
.rst_pm	Rebar set property modifier properties
.rst_pm.more	Rebar set property modifier user-defined attribute properties
.rst_edm	Rebar set end detail modifier properties
.rst_edm.more	Rebar set end detail modifier user-defined attribute properties
.rst_sm	Rebar set splitter properties
.admodel	Analysis model properties
.admodel.more	Analysis model user-defined attribute properties
.lm1	Point load properties
.lm2	Line load properties
.lm3	Area load properties
.lm4	Uniform load properties
.m10000028	Wind load properties
.lm6	Temperature load properties
.lco	Load combination properties
.adnode	Analysis node properties
.adnode.more	Analysis node user-defined attribute properties
.prt_ad, .prt_design	File types associated with steel beam analysis property settings. .prt_ad contains information associated with the analysis part properties and .prt_design contains information associated with the actual steel beam design.
.crs_ad, .crs_design	File types associated with orthogonal steel beam analysis property settings. .crs_ad contains information associated with the analysis part

File or file name extension	Description
	properties and .crs_design contains information associated with orthogonal steel beam design.
.clm_ad, .clm_design	File types associated with steel column analysis property settings. .clm_ad contains information associated with the analysis part properties and .clm_design contains information associated with the actual steel column design.
.dia_ad, .dia_design	File types associated with steel twin profile analysis property settings. .dia_ad contains information associated with the analysis part properties and .dia_design contains information associated with actual twin profile design.
.cpl_ad, .cpl_design	File types associated with contour plate analysis property settings. .cpl_ad contains information associated with the analysis part properties and .cpl_design contains information associated with actual contour plate design.
.cpf_ad, .cpf_design	File types associated with pad footing analysis property settings. .cpf_ad contains information associated with the analysis part properties and .cpf_design contains information associated with the actual pad footing design.
.csf_ad, .csf_design	File types associated with strip footing analysis property settings. .csf_ad contains information associated with the analysis part properties and .csf_design contains information associated with the actual strip footing design.
.ccl_ad, .ccl_design	File types associated with concrete column analysis property settings. .ccl_ad contains information associated with the analysis part properties and .ccl_design contains information associated with the actual concrete column design.
.cbm_ad, .cbm_design	File types associated with concrete beam analysis property settings. .cbm_ad contains information associated with the analysis part properties and .cbm_design contains information associated with the actual concrete beam design.
.csl_ad, .csl_design	File types associated with concrete slab analysis property settings. .csl_ad contains information associated with the analysis part properties and .csl_design contains information associated with the actual slab design.

File or file name extension	Description
.cpn_ad, .cpn_design	File types associated with concrete panel analysis property settings. .cpl_ad contains information associated with the analysis part properties and .cpl_design contains information associated with the actual concrete panel design.
.srf	Surface treatment properties
.srf.more	User-defined surface treatment attribute properties
.srfo	Surface properties
.srfo.more	User-defined surface attribute properties
.cha	Edge chamfer properties
.cha.more	User-defined edge chamfer attribute properties
.scr	Bolt properties
.scr.more	User-defined bolt attribute properties
.wld	Weld properties
.wld.more	User-defined weld attribute properties
*.udwcs	User-defined weld cross sections (UserDefinedWeldCrossSections.udwcs)
.m1000009	Control number properties
.m1000010	Control number locking properties
.num	Numbering setup properties
.rpr	Report properties
.4d	Project status visualization properties
.sas	Assembly properties
.pas	Precast cast unit properties
.ias	Cast-in-place cast unit properties
.ras	Rebar assembly properties
.punit .punit.more	Pour unit properties and user-defined attributes
.pour .pour.more	Pour object properties and user-defined attributes
.pbreak	Pour break properties

File or file name extension	Description
standard.opt	Settings are saved in standard.opt in the \attributes folder only when you save your own settings in the **Options** dialog box using **Save**. There is a standard.opt file in the environment folder that gives the initial values to be loaded when a model is created.

Tekla PowerFab export settings in the \attributes folder

The standard Tekla PowerFab export settings file is saved with the name standard.TeklaPowerFabPluginSettings.xml in the \attributes folder under the model folder. If you save the settings with another name, the settings file is saved as <name>.TeklaPowerFabPluginSettings.xml.

Component properties files in the \attributes folder

Properties files for components in the **Applications & components** catalog, such as .j310000063 for **2L Splice (63)** component properties. These files are stored in the attributes folder under the model folder.

Object-level drawing settings saved in the \attributes folder

File or file name extension	Description
.dprt	Object-level part properties
.dim	Object-level dimension properties
.dimension_mark	Object-level dimension tag properties
.rdim	Object-level rebar dimension mark properties
.pm	Object-level part mark properties
.jm	Object-level connection mark properties
.sm	Object-level bolt mark properties
.rm	Object-level reinforcement mark properties
.mrms	Object-level merged reinforcement mark properties
.pom	Pour object mark properties
.surfm	Object-level surface treatment mark properties
.note	Object-level associative note properties
.wls	Object-level weld mark properties
.lev	Object-level level mark properties

File or file name extension	Description
.rev	Object-level revision mark properties
.drmsh	Object-level reinforcement mesh properties
.drbr	Object-level reinforcement properties
.po	Object-level pour object properties
.sc	Object-level bolt properties
.dsrf	Object-level surface treatment properties
.dgr	Object-level grid properties
.sbl	Object-level symbol properties
.wls	Object-level weld mark properties
.drtxt	Object-level text properties
.gln	Object-level line properties
.grt	Object-level rectangle properties
.gci	Object-level circle properties
.gar	Object-level arc properties
.gpl	Object-level polyline properties
.gpg	Object-level polygon and cloud properties

View-level drawing settings saved in the \attributes folder

File or file name extension	Description
.vi .vi.copt	View-level view properties
.vclassif .vclassif.copt	View-level detailed object-level settings
.vpm	View-level part mark properties
.vsm	View-level bolt mark properties
.vnpm	View-level neighbor part mark properties
.vsurfm	View-level surface treatment mark properties
.vjm	View-level connection mark properties
.vrm	View-level reinforcement mark properties
.vnrm	View-level neighbor reinforcement mark properties
.vpom	View-level pour object mark properties
.vp	View-level part properties
.vs	View-level bolt properties
.vnp	View-level neighbor part properties

File or file name extension	Description
.vsurf	View-level surface treatment properties
.vw	View-level welding properties
.vr	View-level reinforcement properties
.vnr	View-level neighbor reinforcement properties
.vrmp	View-level reference object properties
.vpo	View-level pour object properties
.vg	View-level grid properties
.vf	View-level filter properties
.vnf	View-level neighbor part filter properties

Files related to drawing level properties for single-part drawings saved in \attributes folder

File or file name extension	Description
.wd .wd.copt	Single-part drawing properties
.wd.more	Single-part drawing user-defined attributes
.wdf	Single-part drawing filter properties
.wdnf	Single-part drawing neighbor part filter properties
.wdl	Single-part drawing layout properties
.wdl.more	Single-part drawing user-defined layout attributes
.wdv	Single-part drawing view properties
.wdv.more	Single-part drawing user-defined view attributes
.wdc	Single-part drawing section view properties
.wdc.more	Single-part drawing user-defined section view attributes
.wdd	Single-part drawing dimension properties
.wdd.more	Single-part drawing user-defined dimension attributes
.wdcd	Single-part drawing dimensioning properties
.wdcd more	Single-part drawing user-defined dimensioning attributes
.wpm	Single-part drawing part mark properties
.wsm	Single-part drawing bolt mark properties

File or file name extension	Description
.wnpm	Single-part drawing neighbor part mark properties
.wdsurfm	Single-part drawing surface treatment mark properties
.wdsurfm.more	Single-part drawing user-defined surface treatment mark attributes
.wjm	Single-part drawing connection mark properties
.wdp	Single-part drawing part properties
.wds	Single-part drawing bolt properties
.wds.more	Single-part drawing user-defined bolt attributes
.wdnp	Single-part drawing neighbor part properties
.wdnp.more	Single-part drawing user-defined neighbor part attributes
.wdsrf	Single-part drawing surface treatment properties
.wdsrf.more	Single-part drawing user-defined surface treatment attributes
.wdgr	Single-part drawing grid properties
.wdgr.more	Single-part drawing user-defined grid attributes
.wdr	Single-part drawing protection properties
.wdr.more	Single-part drawing user-defined protection attributes

Files related to drawing level properties for assembly drawings saved in the \attributes folder

File or file name extension	Description
.ad	Assembly drawing properties
.ad.more	Assembly drawing user-defined attributes
.adf	Assembly drawing filter properties
.adnf	Assembly drawing neighbor part filter properties
.adl	Assembly drawing layout properties
.adl.more	Assembly drawing user-defined layout attributes
.adv	Assembly drawing view properties

File or file name extension	Description
.adc	Assembly drawing section view properties
.add	Assembly drawing dimension properties
.add.more	Assembly drawing user-defined dimension attributes
.adcd	Assembly drawing dimensioning properties
.adcd.more	Assembly drawing user-defined dimensioning attributes
.apm	Assembly drawing part mark properties
.asm	Assembly drawing bolt mark properties
.anpm	Assembly drawing neighbor part mark properties
.adsurfm	Assembly drawing surface treatment mark properties
.adsurfm.more	Assembly drawing user-defined surface treatment mark attributes
.ajm	Assembly drawing connection mark properties
.adp	Assembly drawing part properties
.adp.more	Assembly drawing user-defined part attributes
.ads	Assembly drawing bolt properties
.adnp	Assembly drawing neighbor part properties
.adnp.more	Assembly drawing user-defined neighbor part attributes
.adsrf	Assembly drawing surface treatment properties
.adsrf.more	Assembly drawing user-defined surface treatment attributes
.adw	Assembly drawing welding properties
.adw.more	Assembly drawing user-defined welding attributes
.adgr	Assembly drawing grid properties
.adgr.more	Assembly drawing user-defined grid attributes
.adr	Assembly drawing protection properties

Files related to drawing level properties for cast unit drawings saved in the \attributes folder

File or file name extension	Description
.cud .cud.copt	Cast unit drawing properties
.cud.more	Cast unit drawing user-defined attributes
.cudl	Cast unit drawing layout properties
.cudl.more	Cast unit drawing user-defined layout attributes
.cudv	Cast unit drawing view properties
.cudv.more	Cast unit drawing user-defined view attributes
.cudc	Cast unit drawing section view properties
.cudc.more	Cast unit drawing user-defined section view attributes
.cudd	Cast unit drawing dimension properties
.cudd.more	Cast unit drawing user-defined dimension attributes
.cudcd	Cast unit drawing dimensioning properties
.cudcd.more	Cast unit drawing user-defined dimensioning properties
.cupm	Cast unit drawing part mark properties
.cusm	Cast unit drawing bolt mark properties
.cunpm	Cast unit drawing neighbor part mark properties
.cudsurfm	Cast unit drawing surface treatment mark properties
.cudsurfm.more	Cast unit drawing user-defined surface treatment mark attributes
.cudrm	Cast unit drawing reinforcement mark properties
.cudrm.more	Cast unit drawing user-defined reinforcement mark attributes
.cudp	Cast unit drawing part properties
.cudp.more	Cast unit drawing user-defined part attributes
.cuds	Cast unit drawing bolt properties
.cuds.more	Cast unit drawing user-defined bolt attributes
.cudnp	Cast unit drawing neighbor part properties
.cudnp.more	Cast unit drawing user-defined neighbor part attributes

File or file name extension	Description
.cudsrf	Cast unit drawing surface treatment properties
.cudsrf.more	Cast unit drawing user-defined surface treatment attributes
.cudr	Cast unit drawing reinforcement properties
.cudr.more	Cast unit drawing user-defined reinforcement attributes
.cudw	Cast unit drawing welding properties
.cudw.more	Cast unit drawing user-defined welding attributes
.cudgr	Cast unit drawing grid properties
.cudgr.more	Cast unit drawing user-defined grid attributes
.cudrp	Cast unit drawing protection properties
.cudrp.more	Cast unit drawing user-defined protection attributes
.cuf	Cast unit drawing filter properties
.cunf	Cast unit drawing neighbor part filter properties

Files related to drawing level properties for general arrangement drawings saved in the \attributes folder

File or file name extension	Description
.gd .gd.copt	General arrangement drawing properties
.gclassif .gclassif.copt	General arrangement drawing detailed object-level settings
.gd.more	General arrangement drawing user-defined properties
.gdl	General arrangement drawing layout properties
.gdl.more	General arrangement drawing user-defined layout attributes
.gdv	General arrangement drawing view properties
.gdv.more	General arrangement drawing user-defined view attributes
.gdd	General arrangement drawing dimension properties

File or file name extension	Description
.gdd.more	General arrangement drawing user-defined dimension attributes
.gdcd	General arrangement drawing dimensioning properties
.gdcd.more	General arrangement drawing user-defined dimensioning attributes
.gpm	General arrangement drawing part mark properties
.gsm	General arrangement drawing bolt mark properties
.gnpm	General arrangement drawing neighbor part mark properties
.gdsurfm	General arrangement drawing surface treatment mark properties
.gdsurfm.more	General arrangement drawing user-defined surface treatment mark attributes
.gjm	General arrangement drawing connection mark properties
.gdrm	General arrangement drawing reinforcement mark properties
.gdrm.more	General arrangement drawing user-defined reinforcement mark attributes
.gnrm	General arrangement drawing neighbor reinforcement mark properties
.gpom	General arrangement drawing pour object mark properties
.gdp	General arrangement drawing part properties
.gdp.more	General arrangement drawing user-defined part attributes
.gds	General arrangement drawing bolt properties
.gds.more	General arrangement drawing user-defined bolt attributes
.gdnp	General arrangement drawing neighbor part properties
.gdnp.more	General arrangement drawing user-defined neighbor part attributes
.gdsrf	General arrangement drawing surface treatment properties
.gdw	General arrangement drawing welding properties

File or file name extension	Description
.gdw.more	General arrangement drawing user-defined welding attributes
.gdr	General arrangement drawing reinforcement properties
.gdr.more	General arrangement drawing user-defined reinforcement attributes
.gnr	General arrangement drawing neighbor reinforcement properties
.gpo	General arrangement drawing pour object properties
.gpbr	General arrangement drawing pour break properties
.gdrmp	General arrangement drawing reference object properties
.gdrmp.more	General arrangement drawing user-defined reference model attributes
.gdgr	General arrangement drawing grid properties
.gdgr.more	General arrangement drawing user-defined grid attributes
.gdrp	General arrangement drawing protection properties
.gdrp.more	General arrangement drawing user-defined protection attributes
.gdf	General arrangement drawing filter properties
.gdnf	General arrangement drawing neighbor part filter properties

Files related to drawing level properties for multidrawings saved in the \attributes folder

File or file name extension	Description
.md	Multidrawing properties
.md.more	Multidrawing user-defined attributes
.mdl	Multidrawing layout properties
.mdl.more	Multidrawing user-defined layout attributes
.mdr	Multidrawing protection properties
.mdr.more	Multidrawing user-defined protection attributes

Files common to all drawings and files in the \drawings folder

File or file name extension	Description
.dg	Drawing files
.ldb	Drawing export layer properties
.ldr	Drawing link properties
.cs	Section symbol properties
.detail	Detail symbol properties
.fas	Text file properties
.fhl	Hyperlink properties
.dsf	Drawing selection filter properties. This file is saved when you select the **Drawing** --> **Selection filter** check box in the **Filter** or **Selection Filter** properties.
.GridsDimXml .ShapeDimXml .HolesDimXml .FilterDimXml .OverallDimXml .RecessesDimXml .SecPartsDimXml	Dimensioning rules
.dg.DPM	Drawing snapshot files in the\<model> \drawings\snapshots sub-folder. The files are created either automatically or based on a user request. To create a snapshot of a drawing automatically at the same time that you create the drawing, set the advanced option XS_DRAWING_CREATE_SNAPSHOT_ON_DRAWING_CREATION to TRUE. For more information about creating snapshots, see Snapshots in drawings.

Files related to IFC export in the \IFC folder

File or file name extension	Description
.ifc	Exported IFC files

Files related to NC (numerical control) in the \DSTV_Profiles folder

File or file name extension	Description
`.nc1`	NC (numerical control) files

Files in the \ModelSharing folder

File or file name extension	Description
`ModelSharingService.key`	Key file that is needed to share models in Tekla Model Sharing.
`FileSharing.ini`	File sharing settings in Tekla Model Sharing.
`FileSharing.xml`	File needed for file sharing in Tekla Model Sharing.

Files in the \ProjectOrganizer folder

File or file name extension	Description
`.db`	Created when the **Organizer** is opened for the first time. Contains all property template and category information used in the model. The database name shows the version of the database, such as `ProjOrg000020.db`.
`.propertytemplate`	Created when you export a property template from the **Organizer**.
`.category`	Created when you export a category from the **Organizer**.

Files related to reports in the \Reports folder

File or file name extension	Description
`.xsr`	Tekla Structures reports

Files in the \SessionFileRepository folder

File or file name extension	Description
Files in the `SessionFileRepository` folder	Backup copies of the files that are updated or deleted during a Tekla Model Sharing read in.
`SessionFile.db`	Database for managing model folder files in Tekla Model Sharing.
`.storage`	Configuration file for `SessionFile.db`.

Files related to shapes in the \ShapeGeometries and \Shapes folders

File or file name extension	Description
`.tez` `.xml`	Shape geometry descriptions in the `\ShapeGeometries` folder.
`.xml`	Shape descriptions in the `Shapes` folder.

Files in the \screenshots folder

File or file name extension	Description
`.png`	Screenshot taken in Tekla Structures.

Files related to Unitechnik export in the \UT_files folder

File or file name extension	Description
`.uni`	Exported Unitechnik files

File storing options and advanced options

WARNING Changing an advanced option value in `.ini` files located outside of the model folder does not affect existing models.

You can only change advanced options in the **Advanced Options** dialog box or in the `options.ini` file located in the model folder. You cannot change advanced options in an `options.ini` file located in folders defined for the advanced options or .

The `.ini` files are read when you open an existing model, but only new advanced options that do not exist in `options_model.db` or `options_drawings.db`, such as options that are not yet in the **Advanced Options** dialog box but have been added in the software are inserted.

What happens at model creation

When a new model is created, Tekla Structures reads the values of model-specific options and advanced options from the `standard.opt` file, and from the `.ini` files in a certain reading order (page 49). Tekla Structures creates the databases `options_model.db` and `options_drawings.db`, and the `options.ini` file under the model folder.

What happens when you change model-specific options or advanced options

- When you change a model-specific (page 126) option or advanced option in the **Options** or **Advanced Options** dialog box, the settings are applied when you press **OK** or **Apply**.
- The updated model-specific option or advanced option settings are saved in `options_model.db` and `options_drawings.db` under the model folder when the model is saved.
- There are also some special model-specific advanced options that can be updated from the `options.ini` file located in the model folder, such as new advanced options that are not yet in the **Advanced Options** dialog box.
- You can change model-specific advanced options only in the **Advanced Options** dialog box or in the `options.ini` file that is located in the model folder.
- You can change model-specific options only in the **Options** dialog box manually or by loading `standard.opt` file values in the dialog box.

What happens when you change user-specific options or advanced options

- When you change a user-specific (page 126) option or advanced option in the **Options** or **Advanced Options** dialog box, the settings are saved when you press **OK** or **Apply**.

  The settings are saved in the `options.bin` file in the `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UserSettings` folder.
- You can change user-specific advanced options only in the **Advanced Options** dialog box.
- You can change user-specific options only in the **Options** dialog box manually or by loading `standard.opt` file values in the dialog box.

What happens when you save customized settings in the Options dialog box

When you save your own model-specific settings in the Options dialog box (page 107) by pressing **Save**, the `standard.opt` file is saved in the `\attributes` folder under the model folder.

Create a list of advanced options and their values

- To create a complete list of advanced options in a text file, click **Write to file** in the **Advanced Options** dialog box.

The list shows the name of the advanced option, current value and type.

For more information about the `standard.opt` file, see Standard.opt settings

Settings in the Options dialog box

The **Options** dialog box (**File menu** > **Settings** > **Options**) contains the current values for a number of Tekla Structures settings.

Check the settings before you start modeling and change them, if necessary.

The model-specific (page 126) settings in this dialog box are saved in the `options_model.db` and `options_drawings.db` databases in the model folder, and the user-specific (page 126) settings in `options.bin` in your local `<user>` folder. Changing user- or model-specific options in the **Options** dialog box does not require Tekla Structures restart.

You can also save your own settings by using the **Save** button. Then the `standard.opt` file is saved in the `\attributes` folder under model folder. You might want to copy this file to your firm folder. When you create a model, the `standard.opt` is read from the firm folder.

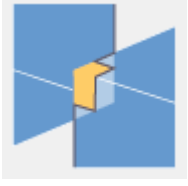
The options in the **Options** dialog box are described below.

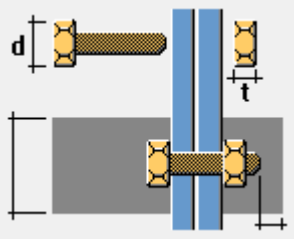
Clash check settings

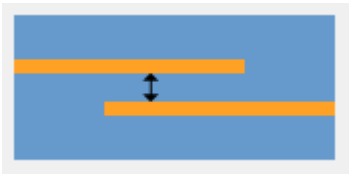
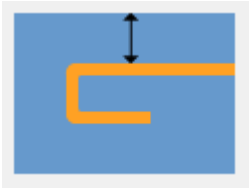
NOTE: Settings on this page are model specific. Changing the settings does not require Tekla Structures restart.

Depending on how the objects selected for clash checking have been modeled, different clash check settings are used. For example, if you have modeled embeds as studs, steel parts, or reinforcing bars, respectively either bolt settings, part settings, or reinforcement settings are relevant.

NOTE Tekla Structures uses a hard-coded tolerance when checking clashes between native parts. If native parts overlap less than 0.25 mm, clashes are not reported.

Option	Description
Allowed penetration volume 	Defines the allowed clash check tolerance if small collisions are acceptable and can be ignored. If the clashing volume is smaller than the given value, for example 1 mm^3, then the clash is not reported. Enter the value in the current volume units.

Option	Description
Clash check between bolt and bolted part	Defines whether the model is checked for clashes that occur between bolts and the related bolted parts. If you select **Yes**, Tekla Structures will check the bolts against the real geometry of the bolted part profiles including roundings, and using the real bolt dimensions.
Define the clash check clearance area for bolts 	Use to check if bolts collide with parts and if there is enough space to fix the bolts. Enter the clearance dimensions in relation to the bolt head or nut diameter **d** (the larger value), and the nut thickness **t**. The clearance in front of the bolted parts is the same as the bolt length. If you do not enter a value, Tekla Structures uses the default value. If you clear the check boxes, the clearance will be zero. If Tekla Structures cannot find the bolt head or nut diameter in the bolt catalog, it uses the shank diameter instead.
Exact solid weld clash check	Defines whether the model is checked for duplicate and overlapping welds and for clashes that occur between welds and other objects (such as parts and bolts). If you select **Yes**, Tekla Structures will check the welds against other welds, against bolts, and against the real geometry of the part profiles including roundings, and using the weld solid dimensions with normal accuracy.
Reinforcing bar vs steel part clearance (negative value to allow overlap)	Defines the minimum clearance or the allowed overlap for reinforcing bars when they are checked against steel parts. To allow reinforcing bars to overlap steel parts and to ignore the ribs of

Option	Description
	bars, enter a negative value. The maximum overlap is the actual bar radius. Tekla Structures only checks the distance from bar side to part. Tekla Structures does not check the distance from bar end to part. If you clear the check box, Tekla Structures will not check the clearance.
Reinforcing bar clearance (negative value to allow overlap) 	Defines the minimum clearance or the allowed overlap for reinforcing bars when they are checked against other reinforcing bars. To allow reinforcing bars to overlap, enter a negative value. If you clear the check box, Tekla Structures will not check the clearance.
Reinforcing bar cover thickness 	Defines the reinforcing bar cover thickness. Tekla Structures checks the cover thickness against the part that the reinforcing bar belongs to. Tekla Structures only checks the distance from bar side to part surface. Tekla Structures does not check the distance from bar end to part surface. If the bar penetrates a part surface, a clash is reported, even if the bar is completely inside a cast unit or pour. If you clear the check box, Tekla Structures will not check the cover thickness.

Components settings

Tekla Structures uses the information about the **Components** tab when it creates parts using system components.

Component properties defined in component dialog boxes override these settings. Tekla Structures only uses these settings if the corresponding boxes in the component dialog boxes are empty.

If you change settings here, Tekla Structures only applies the new settings to components you subsequently create. Components you created prior to changing the preferences are not affected.

NOTE: Settings on this page are model specific. Changing the settings does not require Tekla Structures restart.

Option	Description
Profile names	Defines parametric profile prefixes for plates. It is important that profile names are set up correctly so that you can use filters and wizards effectively. Profile names must exist in the profile catalog. If you want to use a parametric profile that does not have a name in the catalog, first add it to the **Profile Catalog**, then enter it here. Tekla Structures uses the **Folded plate** prefix when you use the folded plates in components.
Bolts	In components, Tekla Structures uses **Factor of bolt edge distance** and **Compare edge distance to** to check that the bolts it creates are not too close to the edge of a part, and warns you if they are. Check that **Factor of bolt edge distance** is set according to the standard you are using. The default edge distance setting depends on your environment. **Compare edge distance** defines whether the edge distance checks are based on bolt or hole diameter. To define the default bolt properties to use in connections, select a **Bolt standard** and **Bolt size**.
Parts	**Part material** defines the default part material grade. Part start numbers defines start numbers for parts that are **Welded to primary** and **Welded to secondary**, **Loose parts**, and **Assembly loose parts**. Cross-check these settings against the numbering series you define to make sure they do not overlap. If they overlap, Tekla Structures might create two non-identical parts with the same part number. This generates an error in the Numbering history log file.

Drawing dimensions settings

NOTE: Settings on this page are model specific. Changing the settings does not require Tekla Structures restart.

Option	Description
Exaggeration	This setting defines the default values for **Exaggeration limit** and **Exaggeration scaling**. When you enable the exaggeration of the dimensions, a drawing dimension that is narrower than the defined limit is expanded. **Exaggeration limit** defines the default value for this limit. **Exaggeration scaling** defines whether you are using **Paper** or **Model** as the exaggeration scaling method: • If you select **Paper**, the exaggeration limit is multiplied by the view scale. • If you select **Model**, and the scale is 1:10, all the dimensions smaller than 10 mm are exaggerated regardless of the drawing scale.
Absolute dimensions	**Show zero in absolute dimensions** --> **Yes** shows zero at the zero points in absolute dimensions. **Draw absolute dimension values parallel to dimension line** --> **Yes** shows dimensions parallel to dimension lines in absolute dimensions.
Dimensions in tags	**Units**, **Format** and **Precision** define the default unit, format and precision used in dimension tags. Available units: mm, cm, m, foot - inch, cm / m, inch, feet. Available formats: ###, ###[.#], ###.#, ###[.##], ###.##, ###[.###], ###.###, ### #/# and ##$^{\#}$/##.##$^{\#}$. Available precision: 0.00, 0.50, 0.33, 0.25, 1/8, 1/16, 1/32, 1/10, 1/100, 1/1000
Show dimension in middle tag of automatic dimension	Defines whether you want to create dual dimension tags in assembly, single-part, cast unit, or general arrangement drawings. When Tekla Structures creates the drawing, it adds the lower dimension tag in the selected unit, format and precision.

Option	Description
Dimension line	**Dimension line extension length for line arrow** defines the length of the line extension for dimensions that have line arrows. Note that line extensions are not applied to dimensions that have different arrows from line arrows, and certain knock-off dimension types.

Drawing objects settings

NOTE: Settings on this page are model specific. Changing the settings does not require Tekla Structures restart.

Option	Description
Edge chamfer	**Line color** defines the default line color of the edge chamfers in drawings. **Line type** defines the default line type of the edge chamfers in drawings. These values are overridden by the values set in the **Edge Chamfer Properties** dialog box.

General settings

NOTE: On this page, **Autosave** settings are user specific. All other settings are model specific. Changing the settings does not require Tekla Structures restart.

Option	Description
Autosave	**Autosave interval: Autosave after every xx modeling or editing commands** defines how often Tekla Structures automatically saves a model and a drawing. This number represents the number of commands you have given. For example, if you create many objects without interrupting (**Esc**), it counts as one command. **Autosave after creating every xx drawings** defines the number of drawings after which Tekla Structures automatically saves your work. For more information, see: Save a model Autosaving in multi-user mode

Option	Description
Default adaptivity	**Off** means that adaptivity is not defined. **Relative** defines that handles retain their relative distances to the nearest part faces in relation to the part's overall size. **Fixed** defines that handles retain their absolute distances to the nearest part faces. You can also modify the adaptivity settings for each part separately. These modifications override the default settings in the **Options** dialog box. For more information about adaptivity, see Modify the adaptivity of reinforcement, surface treatment, or edge chamfers in parts.

Load modeling settings

Use the settings on the **Arrow length** tab to scale loads in model views.

Use the settings on the other tabs of this page to define the building code and safety factors Tekla Structures uses in load combination.

NOTES:

- Settings on this page are model specific. Changing the settings does not require Tekla Structures restart.
- You should not need to change the building code or safety factors during the project. If you change these settings, you will also need to change the load group types and check the load combinations.

Numbering settings

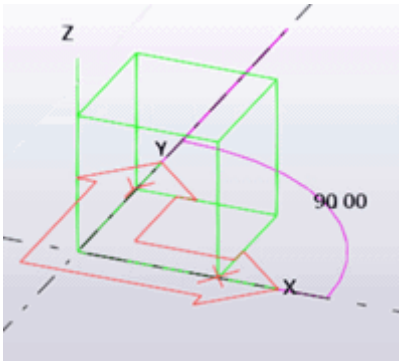
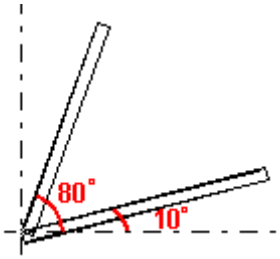
NOTE: Settings on this page are model specific. Changing the settings does not require Tekla Structures restart.

Option	Description
Position number separator	Defines the default position number separator. The options are dot (.), comma (,), slash (/), and hyphen (-).
Rebar position number separator	Defines the default reinforcing bar position number separator. The options are dot (.), comma (,), slash (/), and hyphen (-).
Part number type	Defines the default part number type. The options are **Part number** and **Combined assembly / part number**.

Orientation mark settings

NOTE: Settings on this page are model specific. Changing the settings does not require Tekla Structures restart.

For details of what affects the part orientation and how, see Indicate part orientation.

Option	Description
North direction	**Project north (degrees counter clockwise from global x)** defines which direction is north in the model. Enter the value in degrees counter-clockwise from the global x axis. 
Part viewing direction	Defines which direction parts are viewed from in drawings.
Beam skew limit **Column skew limit**	Tekla Structures uses limit angles to determine whether a part is a beam or a column when creating orientation marks. Tekla Structures treats parts outside these limits as braces.  Parts skewed more than 80° are columns. Parts skewed less than 10° are beams.
Preferred location for mark	Defines the location of part marks in drawings, to the left or right end of the part.
Mark always to center of column	This setting only affects columns. **Yes** places part marks in the center of columns in plan views. To indicate part orientation, include

Option	Description
	compass direction (**Face direction**) in the part mark instead. **No** places part marks on the same flange in general arrangement and assembly drawings.

Rebar set settings

NOTE: Settings on this page are model specific and only apply to rebar sets, not to single reinforcing bars, reinforcing bar groups, or reinforcement meshes. Changing the settings does not require Tekla Structures restart, but you need to update the existing rebar sets in the model. To do this, go to the **Rebar** tab on the ribbon and click **More** --> **Regenerate**.

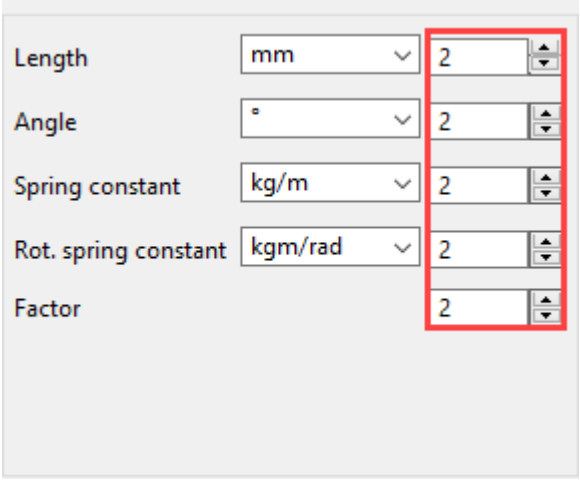
Option	Description
Covers and locations tab	
Concrete cover	Under **Part global coordinate system**, define the default concrete cover thickness between the rebar set bars and the following faces of concrete parts: • **Top** • **Bottom** • **Sides** To use the parts' local coordinate system, under **Part local coordinate system**, define the default concrete cover thickness at the following faces of concrete parts: • **Top** • **Bottom** • **Front** • **Back** • **Start** • **End** You can also define concrete cover settings for each concrete part separately. These modifications override the default settings in the **Options** dialog box.
Layer prefix	Under **Part global coordinate system** and/or **Part local coordinate system**, define the default bar layer prefixes at different faces of concrete parts. You can also define bar layer settings for individual rebar sets or leg faces, or for individual bars using

Option	Description
	the user-defined attributes of property modifiers. These modifications override the default settings in the **Options** dialog box.
Links	Define the bar layer prefix for rebar set bars that have four or more legs, for example closed stirrups.
General tab	
Minimum lengths to be created	Define **Minimum bar length** to prevent Tekla Structures from creating reinforcing bars that are too short. This setting is primarily for straight bars. Enter the minimum bar length as **Distance** or as **Coefficient of bar diameter**. Define **Minimum straight start/end leg length** for bent reinforcing bars. Enter the minimum leg length as **Distance** or as **Coefficient of bar diameter**. These settings are also available in the **Rebar set** properties and in the **Rebar property modifier** properties.
Rounding and step tapering tab	
Rounding	Define whether the lengths of straight bars, first and last legs, and intermediate legs are rounded in the model, and whether the bar lengths are rounded up, down, or to the nearest suitable number according to the rounding accuracy. At splitter locations, define how much the bar lengths can be rounded up. Rounding settings are also available in the **Rebar set** properties and in the **Rebar property modifier** properties.
Step tapering	Define the tapering step values for straight bars, first and last legs, and intermediate legs. Step tapering settings are also available in the **Rebar set** properties and in the **Rebar property modifier** properties.

Units and decimals settings

NOTE: Settings on this page are model specific. Changing the settings does not require Tekla Structures restart.

The number located to the right of each option indicates the number of decimals. The number of decimals affects the input and storage accuracy. Always use a sufficient number of decimals.



For more information about unit and decimal settings, see Change units and decimals.

Option	Units
Modeling tab	
Length	mm cm m in (decimal) ft (decimal) ft-in
Angle	° rad
Spring constant	kg/m kg/cm kg/mm T/m T/cm T/mm N/m N/cm N/mm daN/m daN/cm daN/mm

Option	Units
	kN/m kN/cm kN/mm lbf/in lbf/ft kip/in kip/ft
Rot. spring constant	kgm/rad kgm/° Tm/rad TM/° Nm/rad Nm/° daNm/rad daNm/° kNm/rad kNm/° lbf-in/rad lbf-in/° lbf-ft/rad lbf-ft/° kip-in/rad kip-in/° kip-ft/rad kip-ft/°
Factor	(no units)
Force	kg T N daN kN lbf kip

Option	Units
Distributed load	kg/m T/m N/m daN/m kN/m lbf/in lbf/ft kip/in kip/ft
Surface load	kg/m^2 T/m^2 N/m^2 daN/m^2 kN/m^2 psi psf ksi ksf
Moment	kgm Tm Nm daNm kNm lbf-in lbf-ft kip-in kip-ft
Distributed moment	kgm/m Tm/m Nm/m daNm/m kNm/m

Option	Units
	lbf-ft/ft kip-ft/ft
Temperature	°C °F °K
Deformation	mm cm m in (decimal) ft (decimal) ft-in
Catalogs tab	
Section dimension	mm cm m in (decimal) ft (decimal) in ft-in
Angle	° rad
Area	mm^2 cm^2 m^2 in^2 ft^2
Section modulus	mm^3 cm^3 m^3 in^3 ft^3

Option	Units
Moment of inertia	mm^4 cm^4 in^4
Radius of inertia	mm cm m in (decimal) ft (decimal) ft-in
Torsion constant	mm^4 cm^4 in^4
Warping constant	mm^6 cm^6 in^6
Cover area	m^2/m mm^2/m cm^2/m ft^2/ft in^2/ft in^2/in
Strength	kg/m^2 kg/cm^2 kg/mm^2 T/m^2 T/cm^2 T/mm^2 N/m^2 N/cm^2 N/mm^2 daN/m^2

Option	Units
	daN/cm^2 daN/mm^2 kN/m^2 kN/cm^2 kn/mm^2 psi psf ksi ksf
Modulus	kg/m^2 kg/cm^2 kg/mm^2 T/m^2 T/cm^2 T/mm^2 N/m^2 N/cm^2 N/mm^2 daN/m^2 daN/cm^2 daN/mm^2 kN/m^2 kN/cm^2 kN/mm^2 psi psf ksi ksf
Density	kg/m^3 T/m^3 N/m^3

Option	Units
	kN/m^3 lbf/ft^3
Weight	kg T N lbf kip
Strain	o/oo % (No units)
Thermal dilat. coeff.	1/°C 1/°F 1/°K
Ratio	o/oo % (No units)
Volume	mm^3 cm^3 m^3 in^3 ft^3
Analysis results tab	
Length	mm cm m in (decimal) ft (decimal) ft-in
Angle	° rad
Reinforcement area	mm^2 cm^2 m^2

Option	Units
	in^2 ft^2
Transverse reinforc.	m^2/m mm^2/m cm^2/m ft^2/ft in^2/ft in^2/in
Weight	kg T N lbf kip
Mass/Length	kg/m T/m N/m daN/m kN/m lbf/ft
Volume	mm^3 cm^3 m^3 in^3 ft^3
Force	kg T N daN kN lbf kip

Option	Units
Distributed load	kg/m T/m N/m daN/m kN/m lbf/in lbf/ft kip/in kip/ft
Surface load	kg/m^2 T/m^2 N/m^2 daN/m^2 kN/m^2 psi psf ksi ksf
Moment	kgm Tm Nm daNm kNm lbf-in lbf-ft kip-in kip-ft
Temperature	°C °F °K
Stress	kg/m^2 kg/cm^2

Option	Units
	kg/mm^2 T/m^2 T/cm^2 T/mm^2 N/m^2 N/cm^2 N/mm^2 daN/m^2 daN/cm^2 daN/mm^2 kN/m^2 kN/cm^2 kn/mm^2 psi psf ksi ksf
Deformation	mm cm m in (decimal) ft (decimal) ft-in

Settings defined by advanced options

Advanced options can be specific to the user, model, system, or role.

User-specific advanced options

User-specific advanced options work in the specified way in all of your models and are saved in your local `options.bin` file. By default, this file is located in `C:\Users\<user>\AppData\Local\Trimble\Tekla Structures`

\<version>\UserSettings. The folder can be changed using the advanced option .

In the **Advanced Options** dialog box, the type is **USER**. Some user-specific advanced options require you to restart Tekla Structures after changing the value.

Model-specific advanced options

Model-specific advanced options work in the specified way only in the current model. They are saved to options_model.db and options_drawings.db files in the model folder.

In the **Advanced Options** dialog box, the type is **MODEL** or **DRAWING**.

Some special model-specific options that are not visible in the **Advanced Options** dialog box can be changed in the options.ini file in the model folder.

System-specific advanced options

System-specific advanced options are general to all sessions of Tekla Structures, and work in the specified way for all users and in all models.

In the **Advanced Options** dialog box, the type is **SYSTEM**. A system-specific advanced option can be stored to options database by clicking **SYSTEM** next to the option and changing it to **MODEL(SYSTEM)**. Note that the changed value only works for the current model. A **MODEL(SYSTEM)** advanced option can be changed back to **SYSTEM** by changing it to **SYSTEM**, and in this case it will be removed from the options database. Some system-specific advanced options require restarting of Tekla Structures after changing the value.

The system-specific advanced options are read from environment .ini files:

- **Global system settings** are read from common env_global_default.ini (page 55) in ..\ProgramData\Trimble\Tekla Structures\<version>\environments\common\. These settings are used in all environments.
- **Environment-specific system settings** are read from env_<environment>.ini (page 55) in your environment folder. They override any settings that are defined on a global level in env_global_default.ini.
- **Role-specific system settings** are read from role_<role>.ini (page 56) in environment folder. They override any settings that are defined on a global and environment level in env_global_default.ini and env_<environment>.ini.
- **Company level system-specific system settings** override all other system-specific advanced options. You can save them in the firm or project folders by setting the folders for the advanced options XS_FIRM and XS_PROJECT.

For more information about how the environment .ini files are read, see Typical initialization files (.ini files) and their reading order (page 49).

SYSTEM(ROLE) advanced options

SYSTEM(ROLE) options are typically role specific. The settings are read from `.ini` files and are not saved to the databases. When a setting or the type is changed, the option becomes model-specific and is saved to the databases.

MODEL(ROLE) and **DRAWING(ROLE)** options are SYSTEM(ROLE) options for which the type or settings have been changed. The change would be used when you want the **SYSTEM(ROLE)** option to be saved with the model to `options_model.db` and `options_drawings.db` under model folder. These settings can be set back to **SYSTEM(ROLE)**, which will then take into use the default value.

See also

Typical initialization files (.ini files) and their reading order (page 49)

Change advanced option values in Advanced options dialog box

Use advanced options to configure Tekla Structures to suit the way you work, or to comply with specific project requirements or industry standards.

NOTE The settings in the **Advanced options** dialog box override the settings in any other initialization files. We recommend that you change advanced options in the **Advanced options** dialog box in most cases.

In some cases, you might need to change the advanced option in an `.ini` file, such as when the advanced option does not exist in the **Advanced options** dialog box, or when you want to use the same value in all new models.

For example, you can add the advanced option to an environment `.ini` file. For more information about other `.ini` files, see Typical initialization files (.ini files) and their reading order (page 49).

1. On the **File** menu, click **Settings** --> **Advanced options** to open the **Advanced Options** dialog box.
2. Browse the categories or search to find the advanced option that you want to set.

   To search for advanced options, enter a search term in the **Search** field. To search for the search term in all categories, select **In all categories**.

   You can also use wildcards in searches. For example, to find all advanced options that have the words `anchor` and `filter`, with any characters between these two words, enter `anchor*filter`.
3. Select the type of the advanced options from the list next to the option type.
   - You can change the type of role-specific advanced option between **SYSTEM (ROLE)**, **MODEL (ROLE)**, and **DRAWING(ROLE)**.

    - When you change the option type to **SYSTEM(ROLE)**, the value automatically changes to the default value.
    - When you enter a value for a **SYSTEM (ROLE)** option, it changes to **MODEL (ROLE)** or **DRAWING(ROLE)**.
  - You can change the type of system-specific advanced options from **SYSTEM** to **MODEL(SYSTEM)**. When you change the option type to **MODEL(SYSTEM)**, the value is saved in the options database. If you change the advanced option back to **SYSTEM**, the value is removed from the options database and the value specified in initialization files is used.
4. Enter the value for the advanced option or select the value from the list.
   - You can use switches with some advanced options, for example, to define the contents of marks: `%TPL:PROJECT.NUMBER%`.

     If you are defining a switch for an advanced option in the **Advanced Options** dialog box, use single percent signs %xxx% around the switch.

     If you are defining the switch in an `.ini` file, use double percent signs %%xxx%% around the switch.

     For example, add `%%BOLT_NUMBER%%*D%%HOLE.DIAMETER%%` to define the advanced option `XS_BOLT_MARK_STRING_FOR_SIZE` in an `.ini` file.
   - If you need to enter a folder path, you can type a backslash at the end of the folder path or leave it out.
5. Click **Apply** or **OK**.

TIP To create a complete list of advanced options in a text file, click **Write to file**. The list shows the name of the advanced option together with its current value and type. Note that writing to a file is only an export of the current settings, it is not another way of changing the advanced options.

Tekla Structures settings in the Windows registry

The Windows registry stores configuration settings and options in Microsoft Windows operating systems. Registry settings are used during Tekla Structures sessions and during Tekla Structures installation.

WARNING Do not change the registry settings. Changing the settings can cause the operating system to fail. It is possible to view the registry settings using the Registry Editor in Windows.

User settings in the Windows registry

Some of the Tekla Structures user settings, such as general options, and dialog box locations and sizes are stored in the registry.

The settings are saved in a registry key named after the Tekla Structures version number in the registry branch `HKEY_CURRENT_USER\Software\Trimble\Tekla Structures\<VERSION>`.

When you start Tekla Structures for the first time after the installation, Tekla Structures uses the hardcoded default settings. If you change a setting during a Tekla Structures session, Tekla Structures saves the change during the session, or when you exit Tekla Structures. When you open the same version of Tekla Structures again, the changed setting is used.

When upgrading to a newer Tekla Structures version, you can use the Migration Wizard tool to copy the settings that you have changed.

Installation settings in the Windows registry

The Tekla Structures installation saves information to the `HKEY_LOCAL_MACHINE\SOFTWARE\Trimble\Tekla Structures\<VERSION>` registry key.

3.8 Develop applications using Tekla Open API

You can develop your own applications and additional features for Tekla Structures through the Tekla Open API (application programming interface). The Tekla Open API is implemented using Microsoft .NET technology.

Applications that are developed using the Tekla Open API to work with Tekla Structures are called *extensions*. To develop your own extensions, you must write program code outside Tekla Structures. Alternatively, you can download extensions created by others from Tekla Warehouse.

With Tekla Open API you can:

- Record and run user interface actions

  By recording and running user interface actions, you can automate routine tasks, such as creating daily reports.

- Create automation tools

  You can create automation tools for frequently needed objects. For example, with automation tools you can create basic structures or add typical details to drawings.

- Integrate Tekla Structures with other software

  You can use the Tekla Open API and .NET to transfer information between Tekla Structures and other software, such as Analysis & Design software.

- Create new functionality.

For more information about the Tekla Open API and extensions, visit the Tekla Developer Center. Tekla Open API documentation in the Tekla Developer Center includes:

- API reference
- Release notes
- Programming guides
- Exercises
- Code examples
- Best practices

4 Start new projects as a Tekla Structures administrator

Check and customize settings when you start new projects.

4.1 Start the first project

Before you start the first project, plan the project needs and collect the needed resources for the project.

- Set up the project and firm folders (page 16) to store your customized settings.
  - Use the project folder to store all project-specific files, such as drawing title block content, or specific custom tools and settings that should not be used for the entire company. Define the location of the folder using the advanced option in the settings for all users.
  - Use the firm folder and its sub-folders to store all general company-specific files. Define the location of the folder using the advanced option in the settings for all users.
- Plan your company's modeling guidelines.
  - Plan the numbering guidelines.
  - Set up and import a reference model.
- Define the project properties so that reports and drawings show the correct information.
- Set up templates (page 149).
- Plan how users will share models and data (page 181).
- Check the material, profile, shape, bolt, and rebar needs for your project. Plan how you will customize catalogs and databases (page 225) to suit your project needs.

If necessary, you can add new content to the catalogs from other environments, from Tekla Warehouse, or you can import content created in other software solutions.

You can optionally also set up a component (page 339) folder in the **Applications & components** catalog to ensure that everyone in the project uses the same components and finds the components faster.

4.2 Start new projects

When you start new projects, check the project settings that you have previously defined and update them if necessary.

- Set up a new project folder and update the location of the folder for users using the advanced option.
- Reuse files and settings from previous projects (page 133).

  Settings stored in the project and firm folders (page 16) are used automatically when you start a new project. You can optionally transfer other files and settings to the new project manually.
- Check and update the project properties.
- Update your company's modeling guidelines document if your company has started to use any new practices after the previous project.
- Check the material, profile, shape, bolt, and rebar needs for your project. Clean up the catalogs and databases (page 225) so that they contain the relevant content for your project.

4.3 Define project properties

Project information is needed many times during a project. Define the project information at the beginning of a project so that reports and drawings show the correct information automatically.

You can also update the project properties during the project.

1. On the **File** menu, click **Project properties**.
2. Edit the project properties.

   When you edit the properties, Tekla Structures highlights the modified properties in yellow.
3. Click **Modify** to apply the changes.

4.4 Reuse files and settings from previous projects or Tekla Structures versions

You can transfer customized files and settings from a previous project or Tekla Structures version to reuse them in a new project or Tekla Structures version.

If you use project and firm folders (page 16) to store customized settings, the settings are used automatically when you start a new project or upgrade to a new Tekla Structures version.

If you do not use project and firm folders, you must manually transfer the customized settings to the new project or the new Tekla Structures version.

Check advanced options for the project and firm folders

If you use project and firm folders to store customized files for a model, check that advanced options point to the folders where the customized files are located.

1. On the **File menu**, select **Settings** --> **Advanced Options**.
2. Check that the `XS_FIRM`, `XS_PROJECT` and `XS_COMPANY_SETTINGS_DIRECTORY` point to the correct folders.

Manually transfer files and settings to a new project

You can copy many types of files using a local or private online Tekla Warehouse collection. See the Tekla Warehouse instructions for more information.

You can also copy some information automatically to the new version using the Migration Wizard tool.

1. Check at least the following files and settings:
   - Advanced options (page 105)
   - Files (page 44) related to templates, reports and drawings
   - Catalog files (page 69): profile catalog, material catalog, bolt catalog, bolt assembly catalog, rebar shape catalog
   - Conversion files (page 192)
   - NC export settings
   - Printer catalog settings
   - User-defined attributes
   - Saved model object properties
2. Re-install extensions for the new Tekla Structures version.

Import Tekla Structures model and drawings into another model

You can use the **Import model** command to import a Tekla Structures model and drawings to another model. If the imported model is later updated, you can re-import the updated model.

You can use the **Import model** command if you want to:

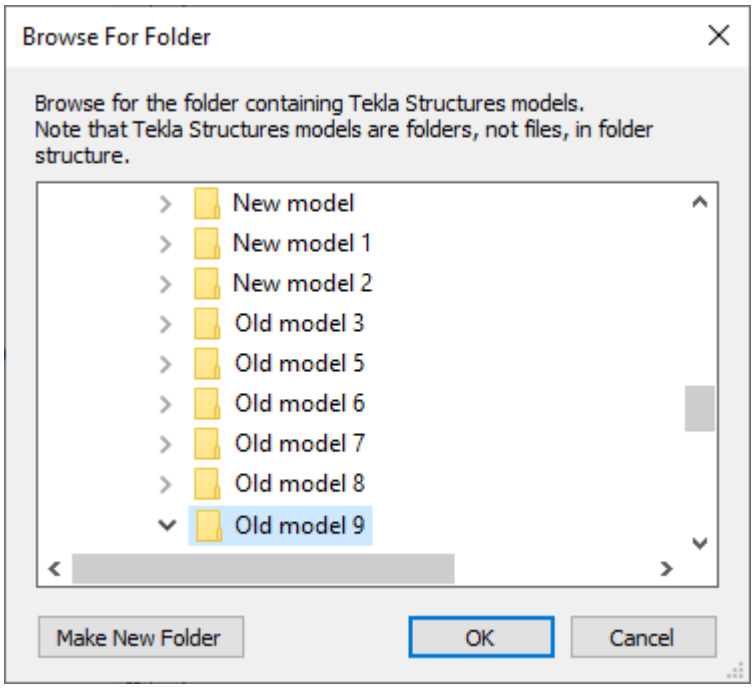
- Import the model into a new blank model due to some issues in the model, such as when:
  - The model is corrupt.
  - There are corrupt parts in the model.
  - The model will not open.
  - A specific function causes an application error, such as numbering or creating a drawing.
- Merge models.
- Bring an older project into a new Tekla Structures version.

Some things to consider before importing:

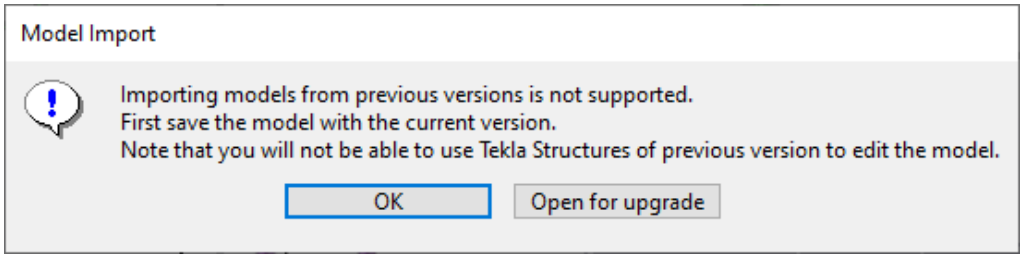
- The import only works in one direction. It cannot be used for two-directional data exchange. For that we recommend using Tekla Model Sharing.
- If you import into an existing model, fix the possible numbering conflicts by adding prefixes in the numbering series.
- You cannot import models from older versions of Tekla Structures directly into a newer version. You must open the model for upgrade.
- You can use the **Import model** command as a replacement for the old model dump import. Import the model into an empty Tekla Structures model created without a model template.
- It is not possible to import a model or parts of it directly into the same model (for example, if the model folder has been copied in the file system and then worked on separately). You can work around this, for example, by first importing the model into a new empty model or by using the **Save as** command to create a copy of the model.
- The **Import model** command only imports the model and the drawings. It does not import attribute files, or database files, because those files might be the cause for the problems in the model.

1. Open the Tekla Structures model into which you want to import the other model.
2. Go to **Quick Launch**, start typing `import model`, then select the **Import model** command from the list that appears.

3. Select a model folder to import, then click **OK**.

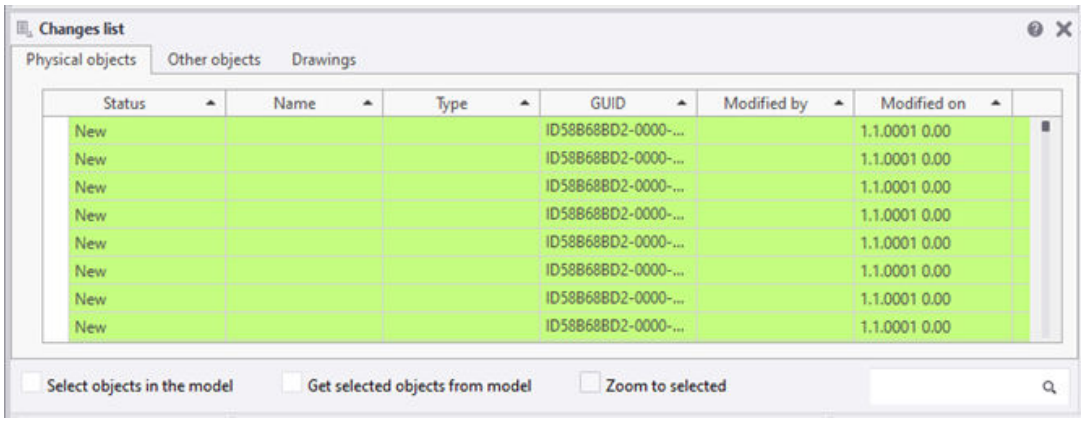


If you open a model from a previous Tekla Structures version, the following message is shown:



To open and save the model in the new version, click **Open for upgrade**.

The model objects and drawings are imported, and the changes are shown using the same listing as is used in Tekla Model Sharing.



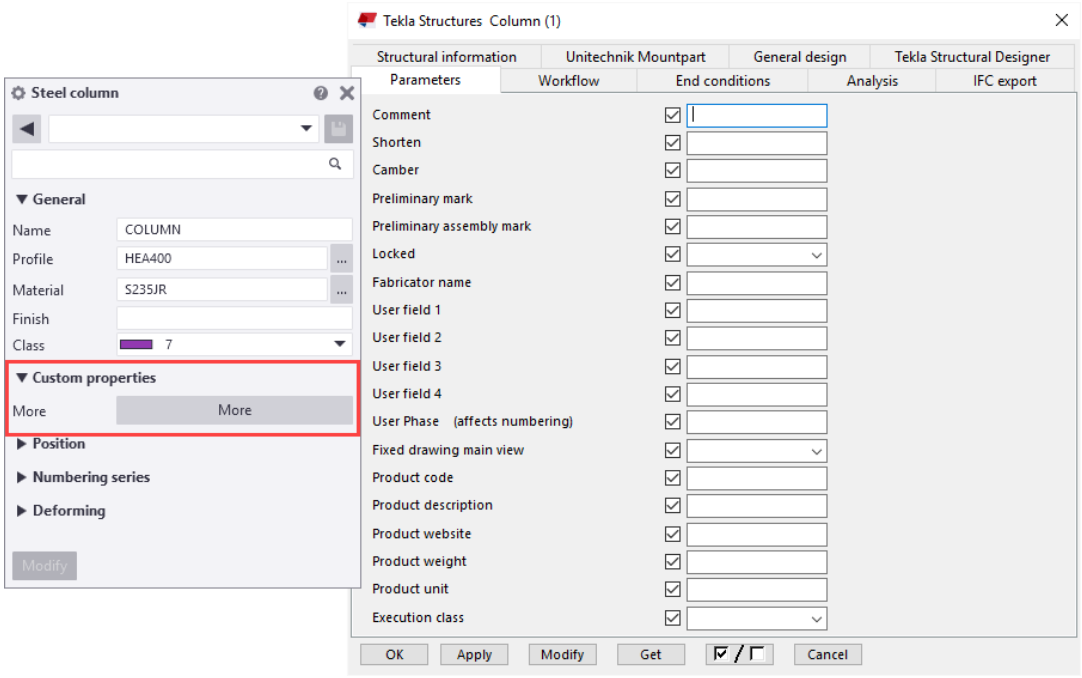
With default settings, the **Locked** attribute is set to **Yes** in the imported objects. Locking is controlled by the advanced option `XS_MODEL_IMPORT_LOCK_OBJECTS` in the **Import** category of the **Advanced options** dialog box.

4.5 Define and update user-defined attributes (UDAs)

User-defined attributes (UDAs) are attributes that you can set for an object in a model or a drawing. You can use UDAs for many purposes, such as in filters, drawings, reports, export, import, fabrication, erection, and revision handling.

The property pane and many dialog boxes contain UDAs for various objects, including beams, columns, bolts and drawings. Tekla Structures shows these

fields when you click the **More** button in the property pane or the **User-defined attributes** button in a dialog box.



When you define new user-defined attributes

You can create your own user-defined attributes that you need in your company, or for a specific project.

The user-defined attributes can be numbers, text, lists, or dates. They can be set to be unique for an object or allowed to be copied. They can also be ignored by numbering or can affect numbering.

- The user-defined attributes are managed in the objects.inp (page 146) file.

  To define new user-defined attributes, create your own `objects.inp` file in the model, project or firm folder.

- When you define a new user-defined attribute, the maximum length for a user-defined attribute name is 19 characters. Tekla Structures only looks for the first 19 characters. For example, Tekla Structures does not consider TEST_ATTRIBUTE_OBJECT and TEST_ATTRIBUTE_OBJECX to be different.

  The attribute name is case-sensitive. Do not use spaces or reserved characters in attribute names.

- Make the definition of the user-defined attribute unique. A user-defined attribute cannot have different definitions for different object types, such as beams and columns.

- After adding your own user-defined attributes, run the **Diagnose and change attribute definitions** command to update the definitions in the model.
- The `object.inp` files are merged so that if there are user-defined attributes in any of the files, they are shown in the user interface. Tekla Structures merges the files in a way that eliminates duplicate attributes. If Tekla Structures encounters the same attribute name in different `objects.inp` files, the attribute from the first read `objects.inp` file is used.
- If you need to have several `objects.inp` files in the same folder, you can use a suffix in the file name to use all the files. This way you can have several `objects_<suffix>.inp` files in the same folder. The file name could be `objects_precast.inp`, for example.

WARNING Do not copy the `objects.inp` file in the `..\environments\common \inp\` folder. Copying the file creates unnecessary duplicates and later `objects.inp` updates by Tekla Structures can be lost.

Search order of objects.inp files

User-defined attributes are defined in `objects.inp` files. These files are located in different folders following the Tekla Structures folder setup, and they are merged together during startup.

The `objects.inp` file reads the user-defined attributes in order from the folders listed below, starting from the model folder:

Folder defined by advanced option	Advanced option
Model	Current model folder
Project	`XS_PROJECT` (your defined project folder)
Firm	`XS_FIRM` (your defined firm folder)
System	`XS_SYSTEM` (your defined system folder)
inp	`XS_INP` (your defined inp folder)

The files are merged so that if there are user-defined attributes in any of the files, they are shown in the user interface. Tekla Structures merges the files so that duplicate attributes are removed. If Tekla Structures encounters the same attribute name in different `objects.inp` files, the attribute from the first read `objects.inp` file is used.

If you need to have several `objects.inp` files in the same folder, you can use a suffix in the file name to use all the files. This enables having several `objects_<suffix>.inp` files in the same folder. The file name could be `objects_precast.inp`, for example.

If you need to change existing user-defined attribute definitions

If you need to change the existing user-defined attributes, such as changing the `value_type`, create a new user-defined attribute instead of modifying the current one in the `objects.inp` file. For example, if you change the `value_type` from `string` to `option`, the value cannot be changed for parts that have the property specified with the old value type, and the value is shown incorrectly in reports or when you inquire objects.

When the advanced option XS_DIAGNOZE_AND_REPAIR_WRONG_UDA_TYPE is set to `TRUE`, you can use **Diagnose & repair** --> **Diagnose and change attribute definitions** to detect and repair the incorrect UDA value types by reverting the value types to the default values. The command checks that the UDA value types, such as `string` or `option`, defined in the `objects.inp` file match their values defined in `environment.db`. A mismatch can happen if you change the value types after the UDA values have been assigned.

Update definitions of user-defined attributes (UDAs) in a model

When you have changed definitions of a user-defined attribute by modifying the `objects.inp` file, update the definitions in the model.

1. Open the model.
2. On the **File** menu, click **Diagnose & repair**.
3. In the **Utilities** section, click **Diagnose and change attribute definitions**.

   The **Diagnose & Change Attribute Definitions** dialog box opens.
4. Select an attribute from the list on left side to see the comparison of current definitions and `objects.inp` definitions.
5. In the **Object classes with Objects.inp differences compared to current settings** list, select the definitions that you want to update.
6. Click **Change current settings to selected Objects.inp settings**.

Environment database file

To ensure consistent model behavior when a model is used with different roles, the environment database file (`environment.db`) contains the definitions of the user-defined attributes (UDAs) used in the model.

When you create a new model, Tekla Structures merges the definitions from your objects.inp (page 146) files to the `environment.db` file. Later, when you

add new user-defined attributes to the `objects.inp` file, the definitions are saved in `environment.db` when you open the model.

You can modify your user-defined attributes in an `objects.inp` file but the changed definitions are not automatically applied. If there are conflicts between definitions in an `objects.inp` file and definitions the `environment.db` file, the definitions in `environment.db` are used. To see the conflicts, run the **Diagnose and change attribute definitions** command, then select the attribute definitions that you want to update in the `objects.inp` file.

NOTE Do not directly edit the `environment.db` file.

Example: Create and update a user-defined attribute (UDA)

This example shows how to create your own user-defined attribute (UDA) and update the model to use the changed attribute definition.

Example: Create a user-defined attribute

1. Create a new model and save it.

   The user-defined attributes in the model are merged from `objects.inp` files and Tekla Structures saves the attribute definitions in the `environment.db` file in the model folder.
2. Close the model.
3. Create an input file called `objects.inp` in the model folder by using a standard text editor.
4. Enter the following information in the `objects.inp` file:

```
/
**********************************************************************
*/
/* Part attributes */
/
**********************************************************************
*/
part(0,"Part")
{
 /* User defined tab page */
 tab_page("My UDA tab")
 {
 /* User defined attribute */
 attribute("MY UDA", "My UDA", string,"%s", no, none, "0,0", "0,0")
 {
 value("", 0)
 }
 }
 tab_page("My UDA tab", "My UDA tab", 19)
 modify (1)
 }
 /
**********************************************************************
*/
```

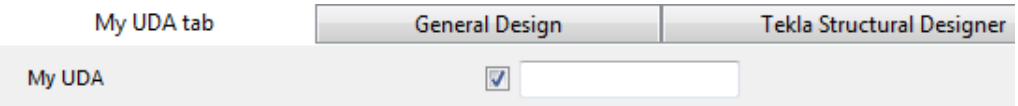
```
 /* Column attributes */
 /
*******************************************************************************
*/
 column(0,"j_column")
 {
 /* Reference to the user defined tab page that is defined above in */
 /* the part() section: */
 tab_page("My UDA tab", "My UDA tab", 19)
 modify (1)
```

NOTE If you want to create a user-defined attribute that also affects numbering, set the special_flag (page 146) property of the attribute to `yes` (it is `no` in the example above). Also, just like in the example above, the definition of the `tab_page` must be in the `part` section, and the `column` (`beam`, etc.) section must have only a reference to it.

5. Save the file.

Example: Test the user-defined attribute

1. Open the model.
2. Create a steel column.
3. Double-click the steel column to open its properties in the property pane.
4. Click the **More** button.
5. Go to the **My UDA tab**.



6. Enter a value in the **My UDA** field.
7. Click **Modify**.
8. Copy the steel column.
9. Select the **My UDA** check box for the new steel column.

   The attribute value is also copied.
10. Close the model.

Example: Modify the user-defined attribute to make it unique

1. Open the `objects.inp` file in the model folder by using a standard text editor.
2. Enter `unique_` before the user-defined attribute.

```
/
*******************************************************************************
*/
/* User-defined attributes */
/
```

```
*****************************************************************************
*/
part(0,"Part")
{
 /* Common tab pages for part attributes */
 tab_page("My UDA tab")
 {
 unique_attribute("MY UDA", "My UDA", string,"%s", no, none, "0,0", "0,0")
 {
 value("", 0)
 }
 }
 tab_page("My UDA tab", "My UDA tab", 19)
 modify (1)
 }
 /
*****************************************************************************
*/
 /* Column attributes */
 /
*****************************************************************************
*/
 column(0,"j_column")
 {
 tab_page("My UDA tab", "My UDA tab", 19)
 modify (1)
 }
```

   Adding `unique_` before the user-defined attribute makes the user-defined attribute unique. The value of the user-defined attribute is not copied to another part.

3. Save the file.

Example: Test the unique user-defined attribute

1. Open the model.
2. Enter a value in the **My UDA** field for a steel column and click **Modify**.
3. Copy the steel column.
4. Select the **My UDA** check box for the new column.
5. The value was copied, so the user-defined attribute in the model is not unique. There is a conflict between the `environment.db` and `objects.inp` definitions.

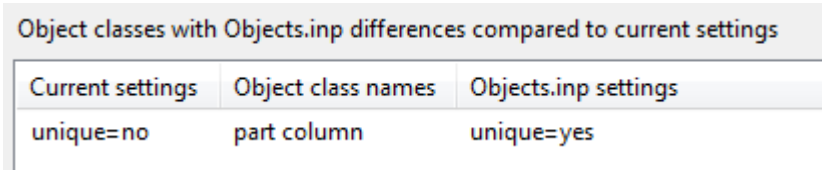
Example: Update the definitions of user-defined attributes

1. On the **File** menu, click **Diagnose & repair** and
2. In the **Utilities** section, click **Diagnose and change attribute definitions**.

   The **Diagnose & Change Attribute Definitions** dialog box opens.

3. Select **My UDA** in the **Attribute** area on the left.

   You can see that **My UDA** is not unique in the current setting, but it is set to unique in `objects.inp`.



4. Select the definition in the area on the right.
5. Click **Change current settings to selected Objects.inp settings**.

   Now the definition of the user-defined attribute is updated in the model.

   If you now copy a steel column that has a value for **My UDA**, the value is not copied to the new column.

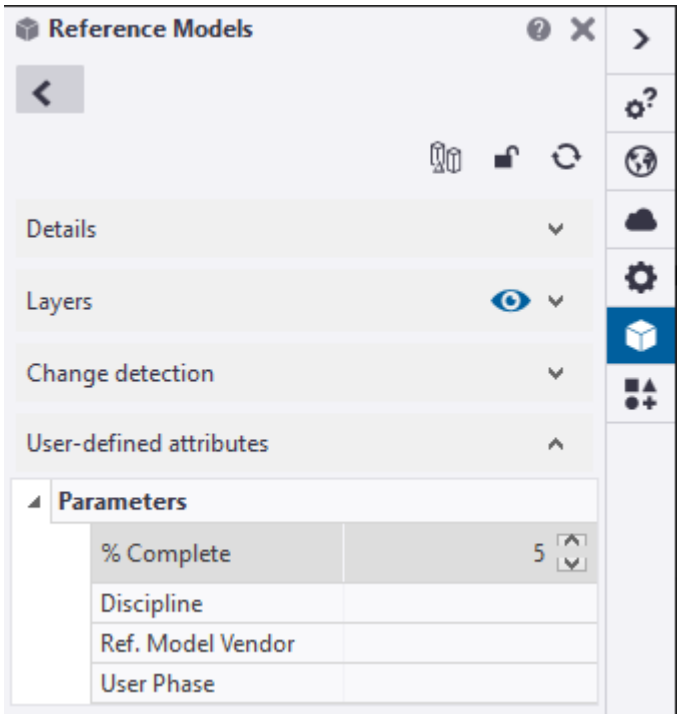
Add UDAs in reference models

To use user-defined attributes in your reference models, you must add the UDAs to the `objects.inp` file if your environment does not contain the necessary reference model UDAs.

NOTE Do not edit the original `objects.inp` file under the environments folder.

To define new user-defined attributes, create your own `objects.inp` file in the model, project or firm folder.

This example shows the text you must add to an `objects.inp` file to create the UDAs that is shown in the image of the side pane.




```
/
*******************************************************************************
*/
/* Reference attributes */
/
*******************************************************************************
*/
reference(0,"j_Reference_model")
 {
 tab_page("","jd_Parameters",10)
 {
   attribute("VENDOR", "Ref. Model Vendor", string, "%s", no, none,
"0.0", "0.0")
   {
     value("", 0)
   }
   attribute("DISCIPLINE", "Discipline", string, "%s", no, none, "0.0",
"0.0")
   {
     value("", 0)
   }
   attribute("PERCENT_COMPLETE", "% Complete", integer, "%s", no, none,
"0.0", "0.0")
   {
     value("", 0)
   }
   unique_attribute("USER_PHASE", "User Phase", string, "%s", yes, none,
"0.0", "0.0")
   {
     value("", 0)
   }
}
modify(1)
}
```

Properties of the objects.inp file

User-defined attribute definitions in the `objects.inp` file follow this structure.

For general information about modifying the definitions, such as file locations and reading order, see Define and update user-defined attributes (UDAs) (page 137).

This example shows the main properties of `objects.inp`:

```
attribute("MY_INFO_1", "My Info 1", string, "%s", no, none, "0.0", "0.0")
{
    value ("", 0)
}
picture("image_name", 8, 2, 260, 25)
```

General properties

Property	In the example	Description
`attribute` or `unique_attribute`	`attribute`	Specifies whether the attribute is a regular attribute or a non-copyable attribute. `attribute` is a regular attribute, which is copied with other part properties. `unique_attribute` is a non-copyable attribute. The value of the attribute is never copied to another part. For example, part checking status attributes usually cannot be copied.
attribute_name	`MY_INFO_1`	The attribute name is used to find the attribute value. Ensure that Tekla Structures does not already use the attribute name that you use. Consider using a prefix that ensures the name is unique, such as your initials, or an abbreviation of your company name. The attribute name is case-sensitive. Do not use spaces or reserved characters in attribute names. The maximum length of the name can be 19 characters. To include the attribute in a report or template, add the name of the attribute to your layout in the

Property	In the example	Description
		Template Editor. When you run a report or create a drawing, Tekla Structures shows the current value of the attribute.
label_text	`My Info 1`	A label that Tekla Structures shows in the dialog box. Some default attributes have prompts like `j_comment`, meaning that the prompt comes from the `joints.ail` message file.
value_type	`string`	The type of value that the field can contain: • `integer`: whole numbers • `float`: numbers that include a decimal point • `string`: text The maximum string length is 79 characters. • `string_not_modifiable`: Text whose modification is prevented. A field with the `string_not_modifiable` property is always shown as dimmed and it cannot be switched on or off. The value in the field is not saved when clicking the **Apply** button or modified when clicking the **Modify** button. • `option`: lists • `date`: date with a small calendar • `date_time_min`: date and time in hours and minutes [12:00] with a small calendar • `date_time_sec`: date and time in hours, minutes, and seconds [12:00:00] with a small calendar If you need to change the `value_type`, create a new user-defined attribute instead of modifying the current one in the `objects.inp` file. For example, if you change the

Property	In the example	Description
		`value_type` from `string` to `option`, the value cannot be changed for parts that have the property specified with the old value type, and the value is shown incorrectly in reports or when you inquire objects. When the advanced option XS_DIAGNOZE_AND_REPAIR_WRONG_UDA_TYPE is set to `TRUE`, you can use **Diagnose & repair** --> **Diagnose and change attribute definitions** to detect and repair the incorrect UDA value types by reverting the value types to the default values. The command checks that the UDA value types, such as `string` or `option`, defined in the `objects.inp` file match their values defined in `environment.db`. A mismatch can happen if you change the value types after the UDA values have been assigned.
field_format	`%s`	Definition of the field format in the dialog box • `%s` for strings • `%d` for numbers
special_flag	`no`	`no` or `yes` For parts: consider in numbering For drawings: show the attribute value in **Document manager** For other elements: no effect
check_switch	`none`	`none` This option is not used.
attribute_value_max	`0.0`	`0.0` This option is not used.
attribute_value_min	`0.0`	`0.0` This option is not used.

Picture properties

Property	In the example	Description
`picture`	`picture`	`picture` is used for adding images in user-defined attributes dialog boxes.
image name	`image_name`	The name of the image
width	`2`	The width reserved for the image
height	`8`	The height reserved for the image
horizontal offset	`260`	The horizontal distance of the left edge of the image from the left edge of the dialog box
vertical offset	`25`	The vertical distance of the top edge of the image from the top edge of the dialog box counted from the lower edge of the tab section

You can also hide or dim user-defined attributes. For more information, see How to hide and grey out user-defined attributes.

4.6 Templates

Templates are descriptions of forms and tables that can be included in Tekla Structures. The contents of the template fields are filled in by Tekla Structures at run time.

Templates are either graphical or textual. Graphical templates are inserted in drawing layouts as tables, text blocks, and drawing headers, for example. Textual templates are used for creating reports.

Tekla Structures includes a large number of standard templates you can use. Use the Template Editor to modify existing templates, or create new ones to suit your needs.

Graphical template definitions have the file name extension `.tpl`. Textual template definitions have the file name extension `.rpt`.

The ready-made textual and graphical templates are located under the environment folders, in `...\ProgramData\Trimble\Tekla Structures\<version>\environments\`. The exact file location may vary depending on the folder structure of your environment files. Textual and graphical templates, except mark templates, can also be read from `XS_FIRM` or `XS_PROJECT` folders. For more information on where the templates are searched for, see Folder search order (page 45).

Examples

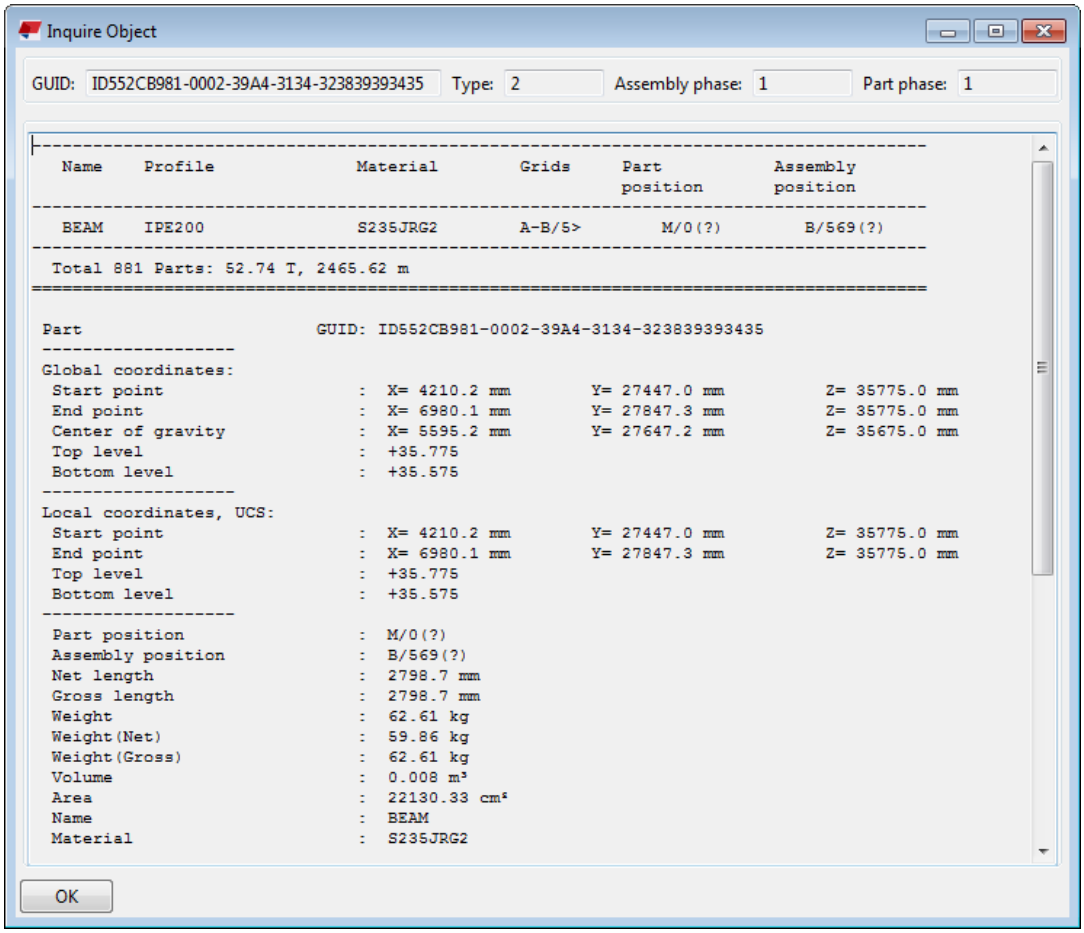
Example of a title block:

No	REV MARK	REVISION DESCRIPTION	CREATED	APPROVED	REV. DATE

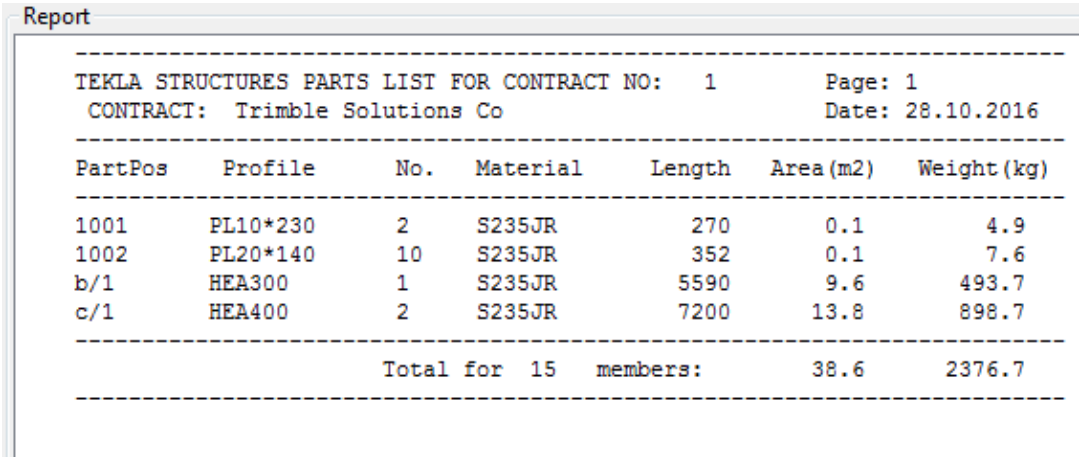
Tekla Structures

DRAWING TITLE	STANDARD		
CONTRACT	Trimble Solutions Corporation		
MODELLED BY	Dean Designer	ISSUED	
CONTRACT NO	1	SCALE 1:10	A2
DRAWING No	[C.1]	REVISION No. 2	

Example of an inquiry report:



Example of a part list report:


Report

TEKLA STRUCTURES PARTS LIST FOR CONTRACT NO: 1 Page: 1
CONTRACT: Trimble Solutions Co Date: 28.10.2016

PartPos	Profile	No.	Material	Length	Area(m2)	Weight(kg)
1001	PL10*230	2	S235JR	270	0.1	4.9
1002	PL20*140	10	S235JR	352	0.1	7.6
b/1	HEA300	1	S235JR	5590	9.6	493.7
c/1	HEA400	2	S235JR	7200	13.8	898.7
	Total for 15 members:				38.6	2376.7

For more information on using templates, see Template Editor User's Guide (page 151) or open the Template Editor Help in the Template Editor by clicking **Help** --> **Contents** .

See also

Create a template (page 151)

Template Editor User's Guide

This guide describes how you can use Template Editor to create, modify and manage template definitions for both reports and drawings.

With Template Editor, you can produce labels, reports and legends allowing you to gather and produce accurate and targeted information. Tekla Structures has a number of ready-made templates, and you can use the Template Editor to modify the existing templates, or create new ones to suit your needs.

Template Editor is also used in other products than Tekla Structures. For this reason, the term *product* is used frequently in the content instead of the name of specific software products. For exact instructions about how to use Template Editor together with Tekla Structures to create and modify templates, see the other articles under Templates (page 149).

The Template Editor User's Guide is currently available in English only. The content is the same as in the Template Editor help. You can find the guide in the PDF format here: Tekla Structures PDF documentation.

Create a template

1. On the **File** menu, click **Editors** --> **Template Editor**.
2. In the Template Editor, click **File** > **New**.

3. Select the template type and click **OK**.

   A new empty template is created.

4. Add new rows in the template.

   a. To add a new row, click **Insert** --> **Component** --> **Row** .

   b. Select a content type for the row, then click **OK**.

5. Add value fields to get the required data from your Tekla Structures database.

   a. Click **Insert** --> **Value field** .

   b. Click a point to define the location of the field within the row.

      The **Select Attribute** dialog box open and prompts you to select an attribute for the value field.

   c. Select an attribute, then click **OK**.

6. Save the template.

   a. Click **File** --> **Save as.**

   b. Browse to the template folder defined for the advanced option `XS_TEMPLATE_DIRECTORY`.

   c. In the **File name** field, enter a name for the template.

   d. Click **OK**.

Create a template in HTML format

Templates in HTML format give you more possibilities for different layout, fonts, and images. Templates that generate output in HTML format are graphical and have the file name extension `*.html.rpt`.

NOTE If you add images to your HTML template (page 165), the images must be in the `..\Program Files\Tekla Structures\<version>\bin\applications\Tekla\Tools\TplEd\bitmaps` folder. Images in other folders are not shown in the HTML output.

---

1. On the **File** menu, click **Editors** --> **Template Editor**.
2. In the Template Editor, click **File** > **New**.
3. Select **Graphical template**, then click **OK**.
4. Add new rows in the template.

   a. To add a new row, click **Insert** --> **Component** --> **Row** .

   b. Select a content type for the row, then click **OK**.

5. Add value fields to get the required data from your Tekla Structures database.

a. Click **Insert** --> **Value field** .

b. Click a point to define the location of the field within the row.

   The **Select Attribute** dialog box open and prompts you to select an attribute for the value field.

c. Select an attribute, then click **OK**.

6. Add a header for each value field.

   a. Click **Insert** --> **Component** --> **Header...**

   b. Click **Insert** --> **Text...**

   c. Enter a heading for the template, and then click **OK**.

   d. Click a point to define the location of the heading in the header row.

7. Save the template:

   a. Click **File** --> **Save as**

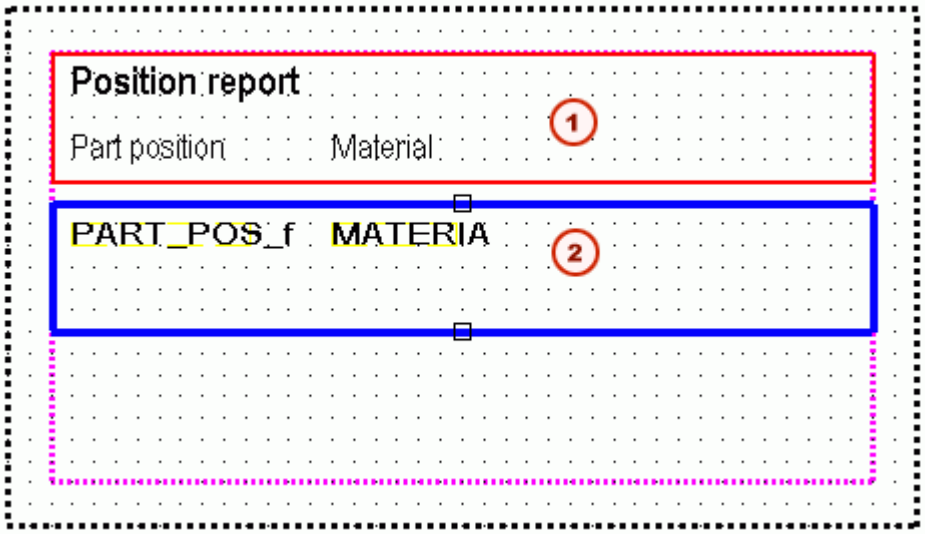
   b. Browse to the template folder defined for the advanced option `XS_TEMPLATE_DIRECTORY`.

   c. In the **File name** field, enter a name for the template.

      Include the extension `*.html.rpt` in the file name. For example, `Part_list.html.rpt`.

   d. Click **OK**.

Example

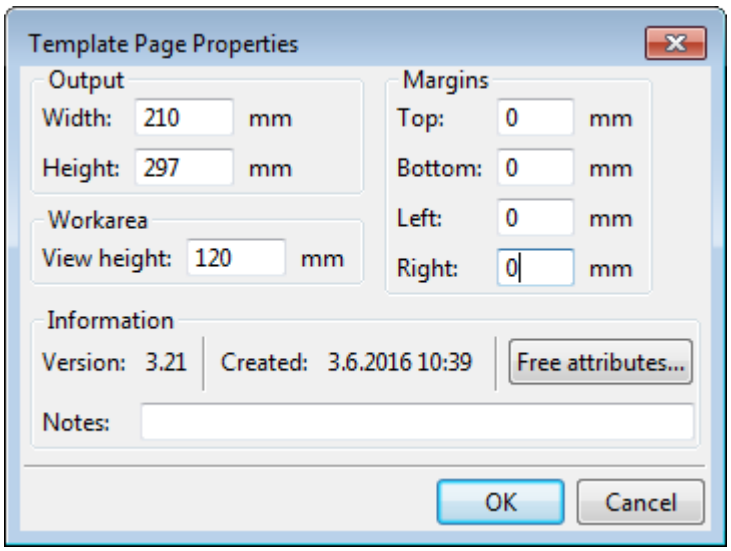


1. Header that contains text fields
2. Row that contains two value fields

Create a .pdf report template

You can create graphical templates to be used for `.pdf` reports.

1. On the **File** menu, select **Editors** --> **Template editor**.
2. Select **File** --> **New** --> **Graphical template**.
3. Click **Edit** --> **Properties**.
4. In **Template page properties** dialog box, set the page size to match the target page size (for example A4):



   The size must match one of the sizes defined in the PaperSizesForDrawings.dat configuration file.

```
A0,                     1189,    841
A1,                     841,     594
A2,                     594,     420
A3,                     420,     297
A4,                     297,     210
A5,                     210,     148
```

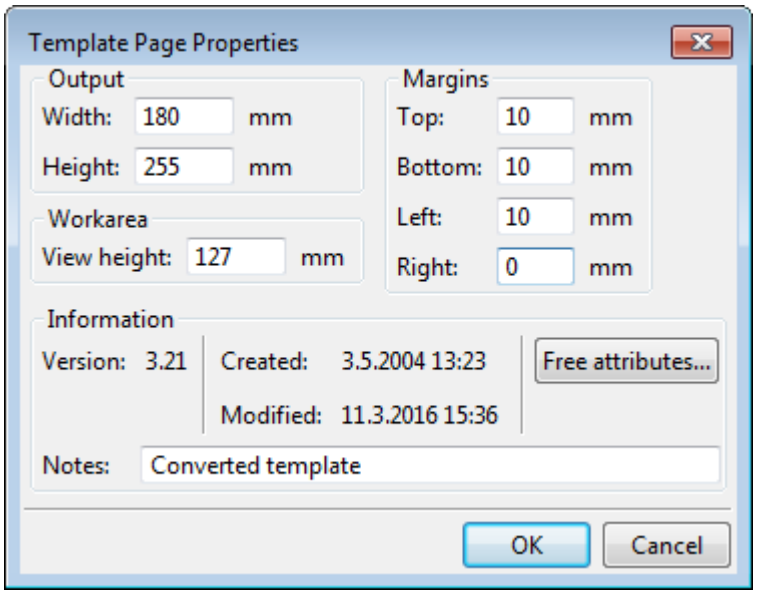
5. Add new rows and value fields to get the required data from your Tekla Structures database. For more information about adding new rows and value fields, see Create a template (page 151).
6. Click **File** --> **Save as**, and save the report with the file name extension `.pdf.rpt`.

7. Copy the new template to your template folder, such as model or your company settings folder (XS_FIRM).

You can now create a `.pdf` report using the new `.pdf` report template. For more information, see Create a report.

Example .pdf report

In this report example, the following page size is used:



Below is an example of a report that has been created using this particular report template.

REBAR BENDING SCHEDULE

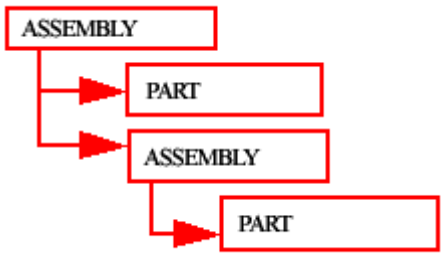
Project: **Rebar fabrication 1**

Pos	Diameter	Number	Grade	Length	Kg/p	Weight	Bending shape	Belongs to
WR/1	10	16	Undefined	800	0.49	7.9	800	W/4
WR/3	16	8	Undefined	7130	11.25	90.0	7130	
WR/4	12	8	Undefined	3490	3.10	24.8	3492	
WR/6	16	4	Undefined	7690	12.14	48.5	7690	
WR/7	12	4	Undefined	4090	3.63	14.5	4092	
WR/11	10	8	Undefined	950	0.59	4.7	950	W/3
WR/12	10	12	Undefined	2080	1.28	15.4	2089	
WR/13	10	12	Undefined	2880	1.78	21.3	2889	
WR/2	8	42	Undefined	830	0.33	13.8	379 / 110	W/3
WR/2	8	96	Undefined	830	0.33	31.5	379 / 110	W/4
WR/5	12	24	Undefined	980	0.87	20.9	507 / 507	
WR/8	6	14	Undefined	830	0.18	2.6	380 / 110	W/3
WR/9	6	22	Undefined	810	0.18	4.0	90 / 380	W/3
WR/10	8	78	Undefined	810	0.32	25.0	90 / 379	W/3
WR/10	8	184	Undefined	810	0.32	58.9	90 / 379	W/4
	Total:	532.0			Total:	383.7		

Example: Create a template for nested assemblies

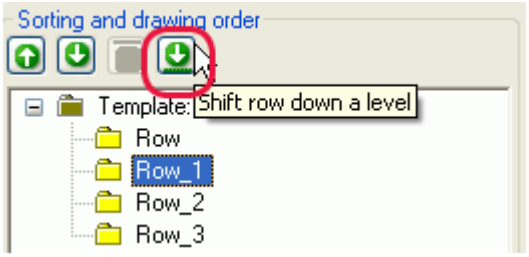
This example shows how to produce a template that shows the hierarchical structure of nested assemblies.

These steps show how to create a nested assembly structure in a textual template similar to the one in this picture:

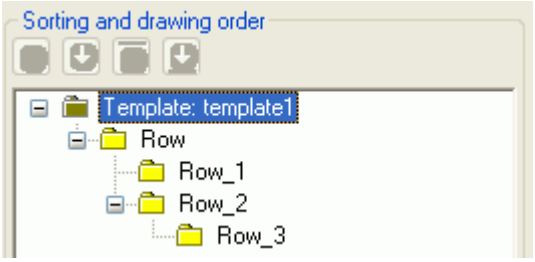


1. On the **File** menu, click **Editors** --> **Template Editor**.
2. In the Template Editor, click **File** > **New**.
3. Select **Textual template**, then click **OK**.
4. Add four new rows in the template.
   a. To add a new row, click **Insert** --> **Component** --> **Row** .
   b. Select a content type for the row, then click **OK**.

      For the first and third row, select the **ASSEMBLY** content type. For the second and fourth row, select the **PART** content type.
5. Use the arrow buttons under **Sorting and drawing order** to create a nested assembly structure for the template.
   a. Move the second and third row down one level.
   b. Move the fourth row down two levels.



The structure should now look like this:



6. Add value fields to get the required data from your Tekla Structures database.

   In this example, the added value fields are assembly or part position, number, and weight.

   a. Click **Insert** --> **Value field** .

   b. Click a point to define the location of the field within the row.

      The **Select Attribute** dialog box open and prompts you to select an attribute for the value field.

   c. Select an attribute, then click **OK**.

7. Modify the layout of the template. For example:

   a. Move objects to show the nested assembly structure in the printed report.

      Select the object that you want to move and drag it to the new position.

   b. Align objects.

      Select the objects that you want to align, right-click, then select an alignment option. For example, select **Align** --> **Right** .

   c. Add a header and a footer.

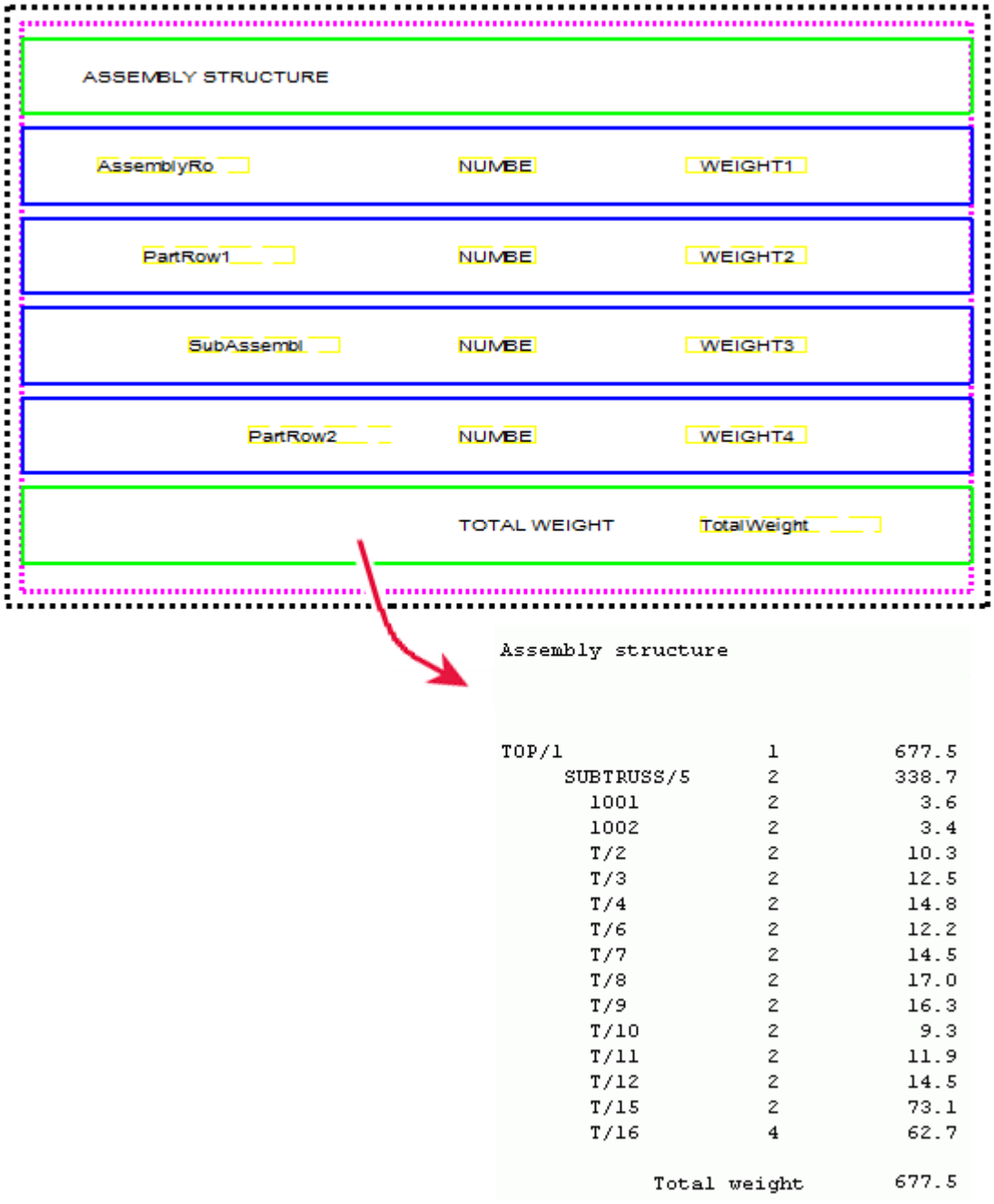
      Click **Insert** --> **Component** --> **Page header** and **Insert** --> **Component** --> **Page footer**.

      Add the required information to the header and footer.

8. Save the template.

Example

This example shows a textual template and a report that has been created using the template:



NOTE You can create graphical templates for nested assemblies in the same manner as textual templates. The difference between graphical and textual templates is that in a graphical template you can show project and company information and graphics, such as table outlines, pictures, or symbols.

Create a template for bending schedules or pull-out pictures

You can use the Template Editor to create bending schedules or pull-outs pictures for reinforcement bars and bent meshes, and control the type of information that is shown in the bending schedules.

1. On the **File** menu, click **Editors** --> **Template Editor**.
2. Click **File** --> **New** .
3. Select **Graphical template**, then click **OK**.
4. To add a new row, click **Insert** --> **Component** --> **Row** .
5. Select **REBAR** or **MESH** as the content type for the row.
6. Add value fields to get the required data from your Tekla Structures database.
   a. Click **Insert** --> **Value field** .
   b. Click a point to define the location of the field within the row.

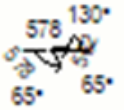
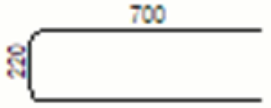
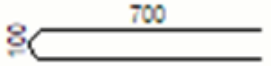
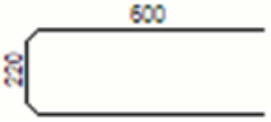
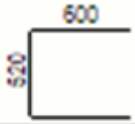
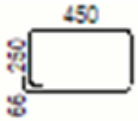
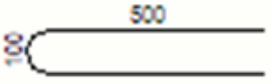
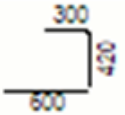
      The **Select Attribute** dialog box open and prompts you to select an attribute for the value field.
   c. Select an attribute, then click **OK**.
7. Insert a graphical field in your **REBAR** or **MESH** content type row.
   a. Click **Insert** --> **Graphical Field...**
   b. Click and drag with the mouse to draw a frame.
8. Double-click the graphical field to open the **Graphical Field Properties** dialog box.
9. Click **Free attributes** and go to the **Application** tab.
10. Select the required bending diagram attributes.

    You can also define the bending diagram attributes on the **User** tab. Note that if the same attribute is set both as **User** attribute and **Application** attribute, the **Application** attribute takes precedence.

    For a list of attributes and values that can be used for bending schedules in templates, see Bending schedule attributes.
11. Save the template.

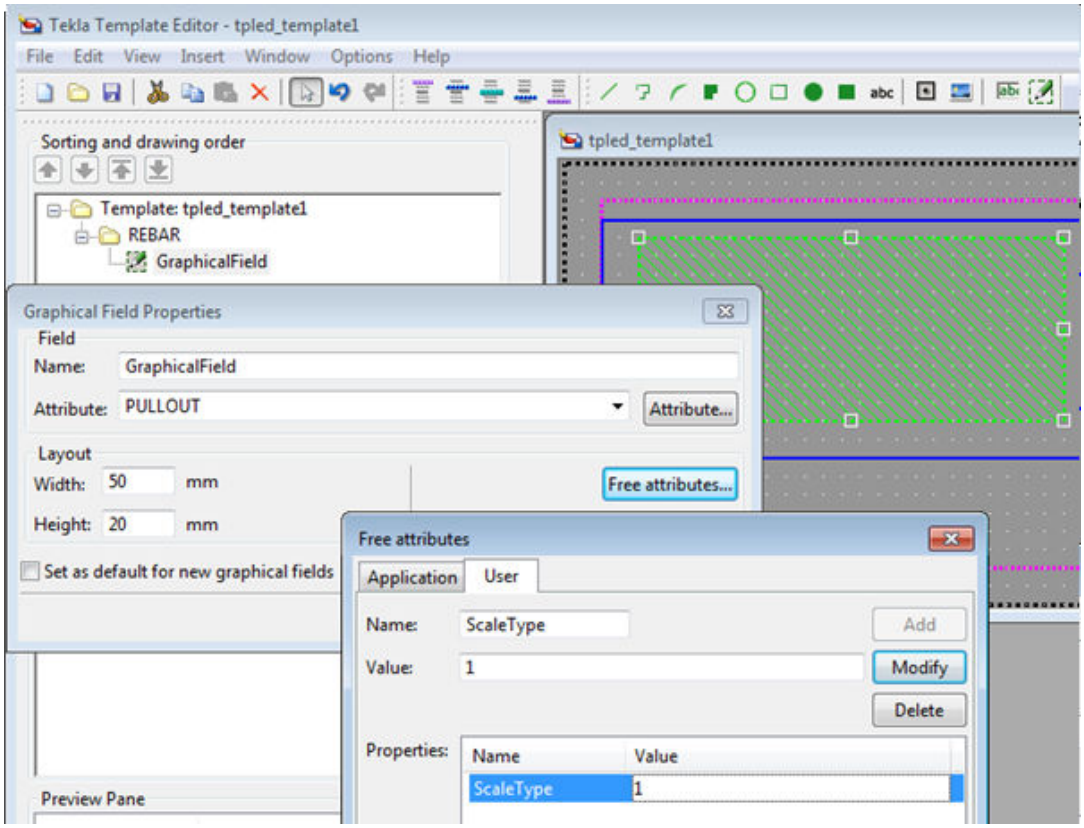
Example

REBAR BENDING SCHEDULE

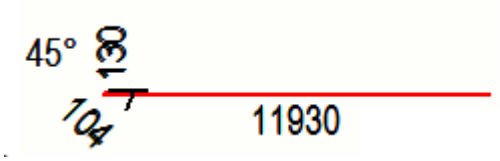
Pos	Diameter	Number	Grade	Length	Kg/p	Weight	Bending shape
R/19	12	6	Unde***	10680	9.48	56.9	
R/189	20	2	Unde***	10680	26.34	52.7	
98	16	2	Unde***	2230	3.52	7.0	
R/10	12	4	Unde***	1560	1.39	5.5	
R/11	12	4	Unde***	1430	1.27	5.1	
R/15	12	4	Unde***	1360	1.21	4.8	
R/18	12	2	Unde***	1660	1.47	2.9	
R/55	8	6	Unde***	1430	0.57	3.4	
R/57	8	57	Unde***	2760	1.09	62.1	
R/100	16	4	Unde***	960	1.52	6.1	
R/136	10	4	Unde***	1030	0.64	2.5	
R/137	10	4	Unde***	1270	0.78	3.1	
					Total:	212.3	

Autoscaling pull-out pictures

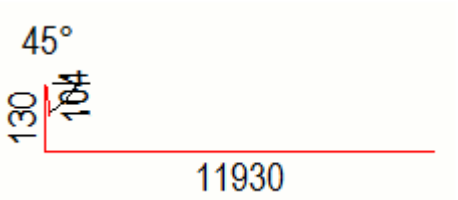
There is a free attribute available for the `PULLOUT` attribute in graphical templates that you can use to define the scale type. If you set the free attribute `ScaleType` to `1` on the **User** tab in the **Free attributes** dialog box, the pull-out pictures will be scaled to fit the available space in both X and Y dimensions. As a result, the shape becomes out of proportion, but small segments can be seen more easily. Note that you can also set this attribute on the **Application** tab.



A bending shape might look like this if you do not define the free attribute `ScaleType`:



The same bending shape that uses the free attribute `ScaleType` with value `1`.



Changing the appearance of pull-out pictures

Tekla Structures uses the settings in the `rebar_config.inp` file in the system folder defined by the advanced option `XS_SYSTEM` to define the appearance of the pull-out pictures. You can change the colors, lines, and dimension unit, format, and precision used in pull-out pictures, for example. For a list of settings and values in `rebar_config.inp`, see

Bending schedule attributes

This table lists the attributes and values that can be used for bending schedules in templates.

Attribute	Default value	Available values
`FontName`	`romsim`	Available template fonts
`FontSize`	`2.0`	Available font sizes
`FontColor`	`1` (black)	`1` = black `2` = red `3` = bright green `4` = blue `5` = cyan `6` = yellow `7` = magenta `8` = brown `9` = green `10` = dark blue `11` = forest green `12` = orange `13` = gray
`RotationAxis`	`2`	`0` = by view `1` = by global Z `2` = by local axis

Attribute	Default value	Available values
ScaleType	0	0 = no 1 = yes If you set the free attribute ScaleType to 1 for the PULLOUT attribute, the pull-out pictures will be scaled to fit the available space in both X and Y dimensions. As a result, the shape becomes out of proportion, but small segments can be seen more easily.
Exaggeration	1	0 = no 1 = yes
EndMark	1	1 = straight 2 = half arrow 3 = full arrow
Dimensions	1	0 = no 1 = yes
BendingRadius	0	Shows the bending radius in form of diameter of the bending roll. 0 = no 1 = yes
BendingAngle	1	0 = no 1 = yes
ImageWidth	Width of the graphical field multiplied by 4.	Number of pixels
ImageHeight	Height of the graphical field multiplied by 4.	Number of pixels
CouplerSymbols	1	Show srebar coupler and end anchor symbols in rebar bending schedules. Rebar coupler symbols will be shown if CouplerSymbols

Attribute	Default value	Available values
		property value is set to 1 and disabled if 0 is entered. The default value is 1.

Add images in a template

You can add images in graphical templates. For example, you might want to include a company logo in your drawings.

Tekla Structures supports the following image formats in graphical templates:

- `.bmp`
- `.jpeg`
- `.jpg`
- `.png`
- `.tif`
- `.tiff`

When adding images in templates:

- Do not add very large images because they update very slowly.
- The image might look different in the image editor and in the printout or in the exported DWG file.
- When you export the drawing as a DWG file, Tekla Structures copies the images in the same folder as the DWG file. If the image is not in the same folder, only the name of the image is shown together with an empty frame instead of the image in the DWG.
- If environments have local symbols, the local symbol folder is also included in the search path with the `common\symbols` folder. If the local symbols folder contains files with the same name as `common\symbols` folder, the local symbol file is used.
- When you open the drawing that contains the images that you inserted in the template, Tekla Structures first looks for the images in the model folder and then in the `\symbols` folder in the current environment.
- You can define a folder where Tekla Structures always looks for images using the advanced option . You can also define a firm folder for your images.

1. Open an existing graphical template or create a new graphical template in the Template Editor.
2. Add a new row in the template:
   a. To add a new row, click **Insert** --> **Component** --> **Row** .

b. Select a content type for the row, then click **OK**.

3. Ensure that you have the row selected, then click **Insert** > **Picture** to open the **Select Picture File** dialog box.

   If a local symbols folder exists, the contents of that folder are shown by default. You can browse for the contents of the `common\symbols` folder by selecting that folder. If a local symbols folder does not exist, Tekla Structures shows the contents of the `common\symbols` folder.

4. If you have images in other folders, you can show these folders in the **Select Picture File** dialog box:

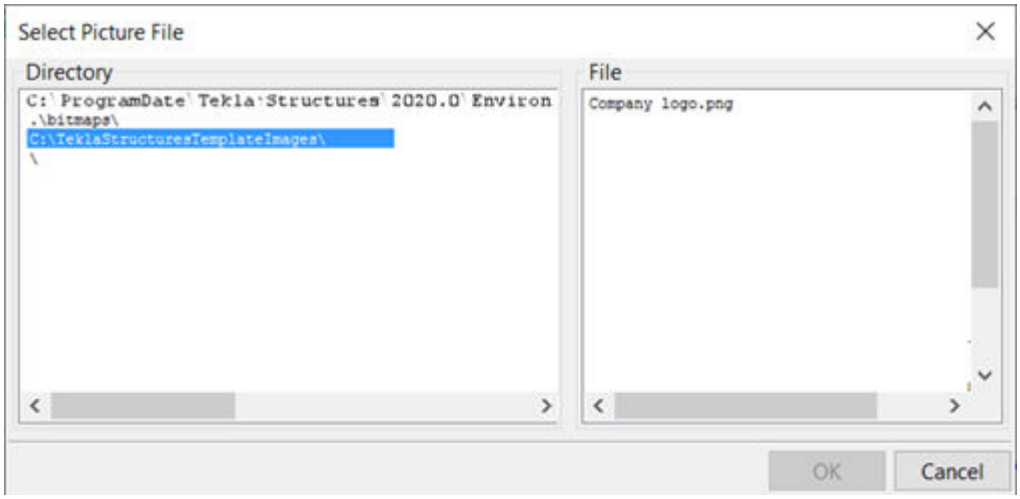
   a. In the Template Editor, click **Options** --> **Preferences**.

   b. Go to the **File Locations** tab.

   c. On the **Symbols, pictures** row, add a new folder separated by a semicolon (;).

      For example:

   The folder that you defined is shown in the **Directory** list:

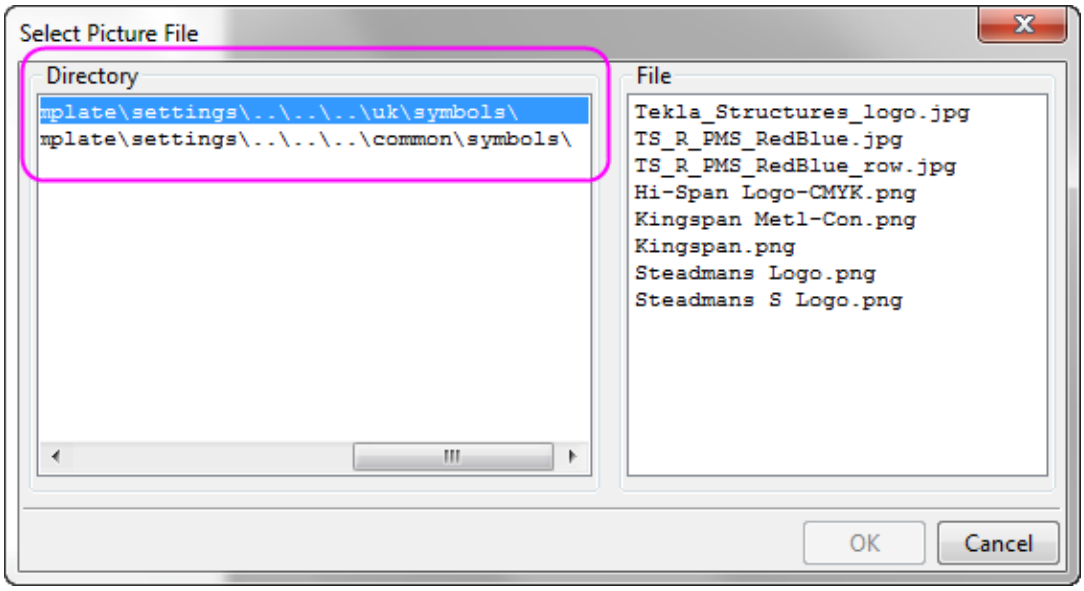


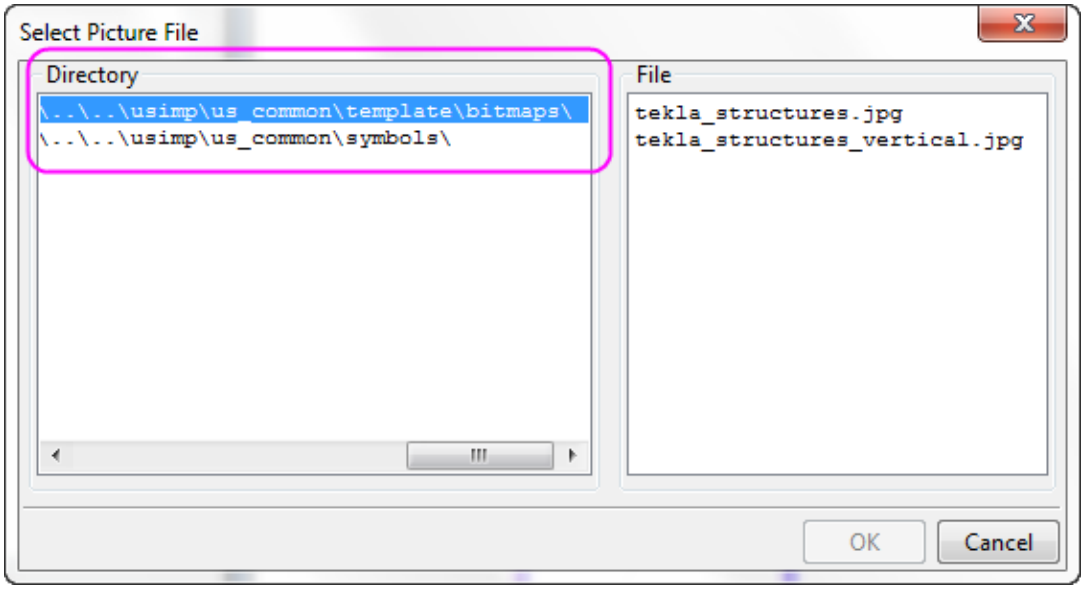
5. Select an image from the **File** list, click **OK**, and add the image.

   You can adjust the size by dragging from the image handles.

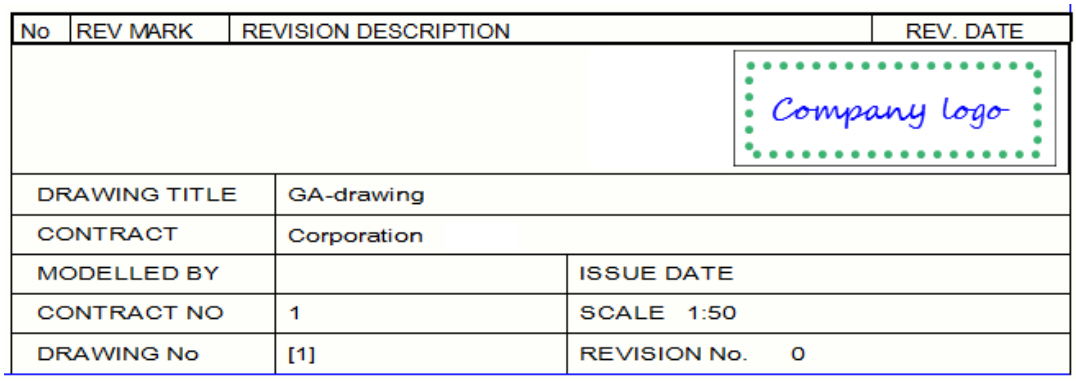
Example

These examples of the **Select Picture File** dialog box show the folder structure in different environments.





In this example, a company logo has been added in a template.



Content types in templates

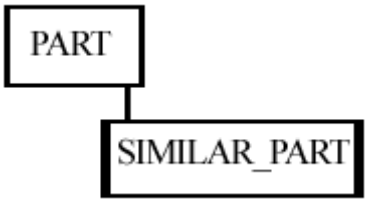
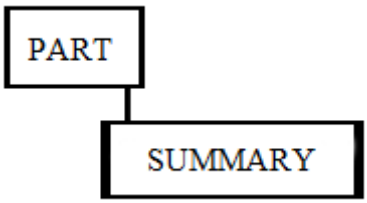
When you create a new row in the template, you must select a content type for the row.

For example, when you add a row, then add a value field, the Template Editor prompts you to specify the content type. The content type determines which template attributes you can use on that row.

The available content types are:

Content type	Description
ANALYSIS_RIGID_LINK	Use to create lists of analysis rigid links.
ANTIMATERIAL	Use to create lists of holes and recesses, or parts removed as a result of a cut. In Template Editor, the same attributes that are available for PART are available for ANTIMATERIAL. However, only the attributes that are useful to be used with ANTIMATERIAL are shown, including NAME, LENGTH, WIDTH, HEIGHT, AREA, PROFILE, and NUMBER, and user-defined attributes.
ASSEMBLY	Use to create lists of assemblies and single parts. Includes all assemblies containing the selected parts and bolts.
BOLT	Use to create screw and bolt lists. Includes all bolts connected to selected parts.
CAST_UNIT	Use to create lists of cast units.
CHAMFER	Use to create lists of the length of the chamfers.
COMMENT	Use to create empty rows or rows that only have textual data or lines anywhere on a template.
CONNECTION	Use to create lists of connections.
DRAWING	Use to create drawing lists without revision history information. Use for reports and included drawings.
HIERARCHIC_CAST_UNIT	Use to create reports listing subassemblies of concrete.
HIERARCHIC_OBJECT	Use to create lists of various types of hierarchies. For example, lists hierarchical objects in Organizer.
HISTORY	Use to retrieve history information of the model. You can use this content type with PART, REBAR, CONNECTION and DRAWING rows. The following template attributes can be used with this content type:

Content type	Description
	• TYPE: the type of the historical action, for example update or numbering. • USER: the user who made the change. • TIME: the time the change was made. • COMMENT: the comment which was entered upon clicking **Save**. • REVISION_CODE: the revision code which was entered upon clicking **Save**.
HOLE	Use to create lists of holes.
LOAD	Use to create lists of loads.
LOADGROUP	Use to create lists of load groups.
MESH	Use to create lists of meshes.
NUT	Use to create lists of nuts. Contains all nuts for bolts associated with the selected parts.
PART	Use to create lists of parts.
POUR_BREAK	Use to create lists of pour breaks.
POUR_OBJECT	Use to create lists of pour objects.
POUR_UNIT	Use to create lists of pour units.
REBAR	Use to create lists of reinforcing bars.
REBAR_ASSEMBLY	Use to create lists of rebar assemblies.
REFERENCE_MODEL	Use to list the reference models.
REFERENCE_OBJECT	Use to list the reference model objects in a reference model. Only reference model objects that have user-defined attributes are displayed in reports.
REFERENCE_ASSEMBLY	Use to list the reference assemblies in a reference model.
REVISION	Use to create lists of revision marks.
SIMILAR_ASSEMBLY	Use to create lists of similar parts. To use this content type, you need to have an empty (hidden in output) ASSEMBLY, PART or CAST_UNIT row in the row hierarchy above the row with SIMILAR_* content type:
SIMILAR_CAST_UNIT	
SIMILAR_PART	

Content type	Description
	 You cannot have any rows below `SIMILAR_*` row content type in the row hierarchy. **Note:** Used in drawings to collect similar object information from the model. All the other attribute information is collected from visible drawing objects.
`SINGLE_REBAR`	Use to create lists of individual bars in reinforcing bar groups. For example, use it to get the lengths of the individual bars in tapered reinforcing bar groups. For rebar sets, `SINGLE_REBAR` works in the same way as `REBAR`.
`SINGLE_STRAND`	Use to create lists of individual prestressed strands.
`STRAND`	Use to create lists of prestressed strands.
`STUD`	Use to create lists of studs.
`SURFACE`	Use to create lists of surfaces.
`SURFACING`	Use to create lists of surface treatments.
`SUMMARY`	Use to summarize the contents of the row(s) that are above `SUMMARY` in the hierarchy.  For example, use `PART` - `SUMMARY` hierarchy to summarize the contents of the `PART` rows.
`TASK`	Use to create lists of tasks.
`WASHER`	Use to create lists of washers. Contains all washers for all bolts associated with the selected parts.
`WELD`	Use to create lists of welds.

Template attribute files (contentattributes.lst)

Template attributes represent object properties. You can use template attributes in value fields, formulas, and row rules to get the required data from your Tekla Structures database.

When you output the template, Tekla Structures replaces the attribute with the actual value of the corresponding object property. For example, if you include the attribute `WEIGHT` in a report template, Tekla Structures shows the weight of the model object in the report.

Template attributes are defined in the following files:

File name	Description
`contentattributes.lst`	This is a container file listing all the files that contain the actual attribute definitions. The files are added with `INCLUDE` sentences. The order of the files included in `contentattributes.lst` defines the reading order of the files. This file is overwritten in the installation when you install a newer version of Tekla Structures. Ensure that you make a copy of this file before updating. Generally, there is no need to modify `contentattributes.lst`. Do not modify it if you are not an administrator.
`contentattributes_global.lst`	This file contains attributes that are hard-coded into the program. **Do not edit this file.**
`contentattributes_userdefined.lst`	This file contains user-defined attributes, the same as in the `objects.inp` file. This file is overwritten in the installation when you install a newer version of Tekla Structures. To use your own attributes in templates and reports, create a copy of this file and add the necessary attributes to that file.

By default, these files are located in `..\Program Files\Tekla Structures\<version>\bin\applications\Tekla\Tools\TplEd\settings`, but the location might be different in your environment.

The search order for the `contentattributes.lst` file is defined in the `tpled.ini` file. The location of the `tpled.ini` file is defined by the advanced option.

The following pointers are allowed in the `tpled.ini` file:

- @\ = location of the `tpled.ini` file
- .\ = location of `tpled.exe` (`C:\Program Files\Tekla Structures \<version>\bin\applications\Tekla\Tools\TplEd`)

To include your own attributes, modify the `contentattributes.lst` files in the relevant environment folders. The `contentattributes.lst` files are overwritten when you install a new version of Tekla Structures.

User-defined template attributes

User-defined template attributes are defined in the `contentattributes_userdefined.lst` file. By default, this file includes most of the user-defined attributes that are visible in the part properties.

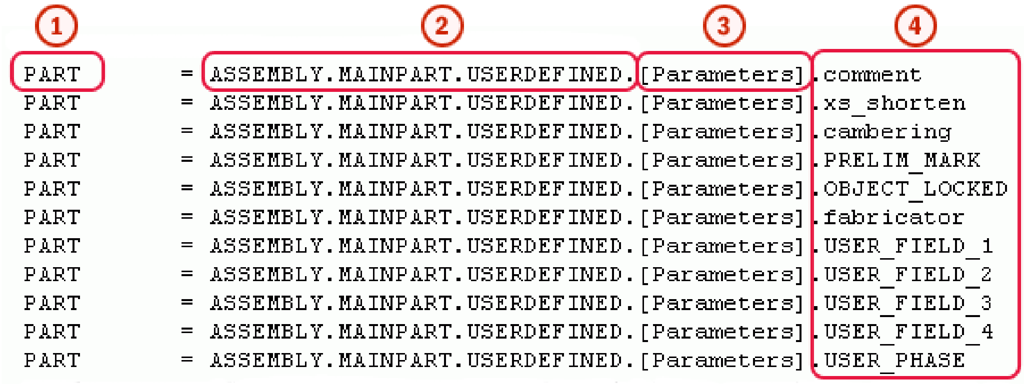
To use your own attributes in templates and reports, make a copy of the file, rename it appropriately, and add the necessary attributes to that file.

The `contentattributes_userdefined.lst` file is divided into two sections:

- A list of attribute names and default settings:

```
..
// Name                          Datatype    Justify  Cacheable  Length
// XXXXX                         FLOAT       RIGHT    TRUE       8
// ------------------------------------------------------------------------
axial1                           FLOAT       RIGHT    TRUE       8
axial2                           FLOAT       RIGHT    TRUE       8
BOLT_COMMENT                     CHARACTER   LEFT     TRUE      64
BOLT_USERFIELD_1                 CHARACTER   LEFT     TRUE      64
BOLT_USERFIELD_2                 CHARACTER   LEFT     TRUE      64
BOLT_USERFIELD_3                 CHARACTER   LEFT     TRUE      64
BOLT_USERFIELD_4                 CHARACTER   LEFT     TRUE      64
BOLT_USERFIELD_5                 CHARACTER   LEFT     TRUE      64
BOLT_USERFIELD_6                 CHARACTER   LEFT     TRUE      64
BOLT_USERFIELD_7                 CHARACTER   LEFT     TRUE      64
BOLT_USERFIELD_8                 CHARACTER   LEFT     TRUE      64
cambering                        CHARACTER   LEFT     TRUE      64
CHECKED_BY                       CHARACTER   LEFT     TRUE      20
CHECKED_DATE                     CHARACTER   LEFT     TRUE      20
comment                          CHARACTER   LEFT     TRUE      30
CONN_CODE_END1                   CHARACTER   LEFT     TRUE      10
CONN_CODE_END2                   CHARACTER   LEFT     TRUE      10
DRAWING_USERFIELD_1              CHARACTER   LEFT     TRUE      64
DRAWING_USERFIELD_2              CHARACTER   LEFT     TRUE      64
DRAWING_USERFIELD_3              CHARACTER   LEFT     TRUE      64
DRAWING_USERFIELD_4              CHARACTER   LEFT     TRUE      64
```

- A list of attributes assigned to content types:



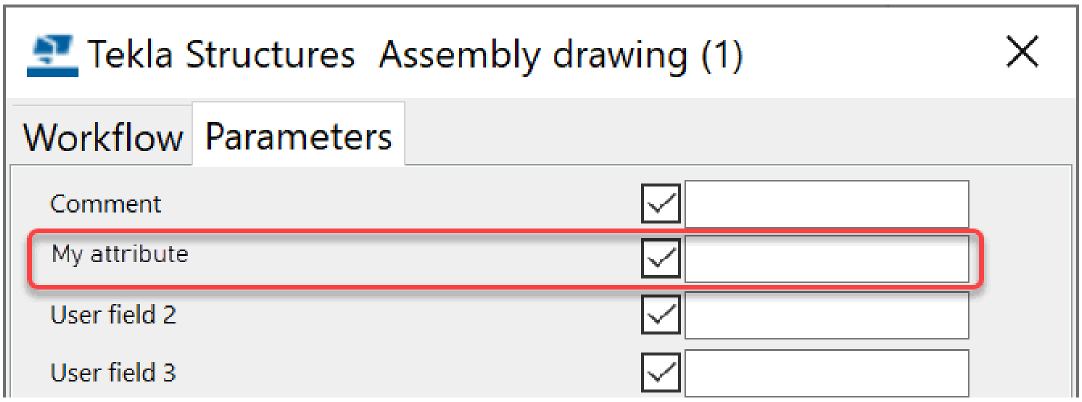
```
PART      = ASSEMBLY.MAINPART.USERDEFINED.[Parameters].comment
PART      = ASSEMBLY.MAINPART.USERDEFINED.[Parameters].xs_shorten
PART      = ASSEMBLY.MAINPART.USERDEFINED.[Parameters].cambering
PART      = ASSEMBLY.MAINPART.USERDEFINED.[Parameters].PRELIM_MARK
PART      = ASSEMBLY.MAINPART.USERDEFINED.[Parameters].OBJECT_LOCKED
PART      = ASSEMBLY.MAINPART.USERDEFINED.[Parameters].fabricator
PART      = ASSEMBLY.MAINPART.USERDEFINED.[Parameters].USER_FIELD_1
PART      = ASSEMBLY.MAINPART.USERDEFINED.[Parameters].USER_FIELD_2
PART      = ASSEMBLY.MAINPART.USERDEFINED.[Parameters].USER_FIELD_3
PART      = ASSEMBLY.MAINPART.USERDEFINED.[Parameters].USER_FIELD_4
PART      = ASSEMBLY.MAINPART.USERDEFINED.[Parameters].USER_PHASE
```


1. The content type of the row in Template Editor
2. The attribute hierarchy in Template Editor
3. Customizable comments, such as the tab name in the user-defined attributes dialog box
4. The name of the user-defined attribute, must be the same as in the `objects.inp` file

Example: Add user-defined template attributes to the Template Editor

This example shows how to add your own user-defined attributes to the attribute tree in the Template Editor.

Before you start, add your user-defined attribute to the `objects.inp` file. For example, you might add an attribute named `MY_ATTRIBUTE` to the user-defined properties of drawings.



1. Open the `contentattributes_userdefined.lst` file in a text editor.

   You can find this file in the `\bin\applications\Tekla\Tools\TplEd\settings` folder in the Tekla Structures installation folder.

2. Save the file with an appropriate name, for example `MY_contentattributes_userdefined.lst`, in the same folder.
3. Add `MY_ATTRIBUTE` to the list of attribute names and, define the settings as follows:

```
MORTAR_WIDTH                    FLOAT       RIGHT     TRUE
MY_ATTRIBUTE                    CHARACTER   LEFT      TRUE
OBJECT_LOCKED                   CHARACTER   LEFT      TRUE
```

4. Add `MY_ATTRIBUTE` to the list of attributes assigned to content types.

   Select the content type according to which object the attribute is associated in the `objects.inp` file. In this example, the content type is `DRAWING`. Add the attribute in the format `USERDEFINED.<ATTRIBUTE_NAME>`.

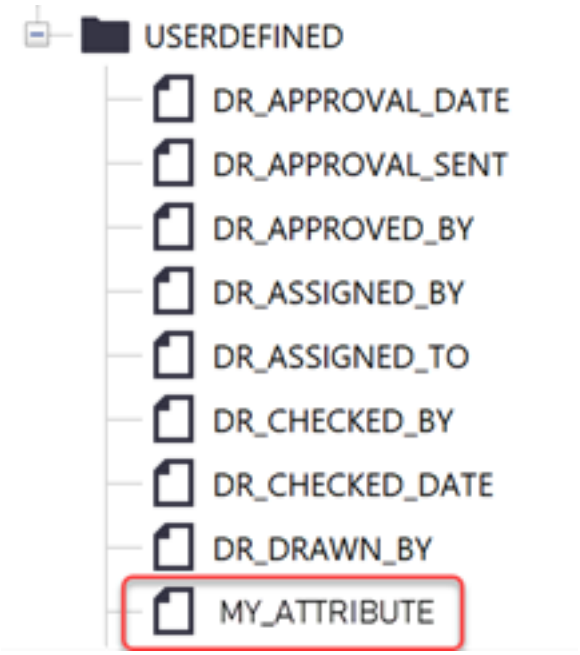
```
// ========================================
//   Drawing attributes
//   ------------------
//   tab_page("DR_Parameters")
// ========================================

DRAWING             =          USERDEFINED.MY_ATTRIBUTE
```

5. Save the changes.
6. Open the `contentattributes.lst` file in a text editor.
7. Add the following line in the file:

   `[INCLUDE MY_contentattributes_userdefined.lst]`
8. Save the changes.

The attribute is shown in the attribute tree in Template Editor, under `DRAWING > USERDEFINED`:



Add comments to user-defined template attributes

You can add your own comments to the user-defined attributes in the Template Editor attribute tree.

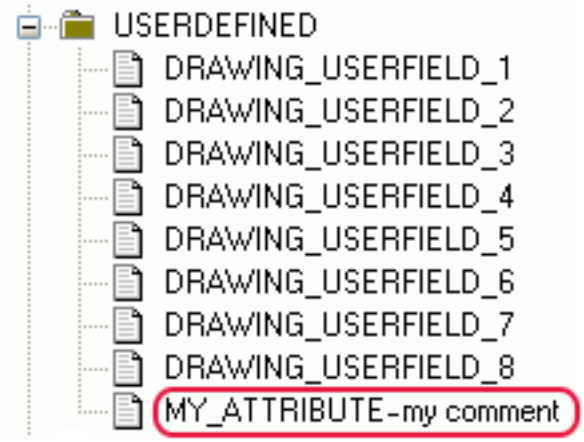
1. Open your copy of the `contentattributes_userdefined.lst` file.

   For example, `MY_contentattributes_userdefined.lst`. Do not modify the original `contentattributes_userdefined.lst` file.
2. Scroll down to the list of attributes assigned to content types.
3. Add your comment inside quotation marks, after the attribute name.

   For example:

   ```
   DRAWING     = USER-DEFINED.MY_ATTRIBUTE "my comment"
   ```
4. Save the changes.

The comment you added is shown in the attribute tree in Template Editor:



Add hierarchy to user-defined template attributes

You can add your own hierarchy to the Template Editor attribute tree.

WARNING User-defined attributes are case sensitive. Ensure that you enter the attribute name using the correct case for all characters.

1. Open your copy of the `contentattributes_userdefined.lst` file.

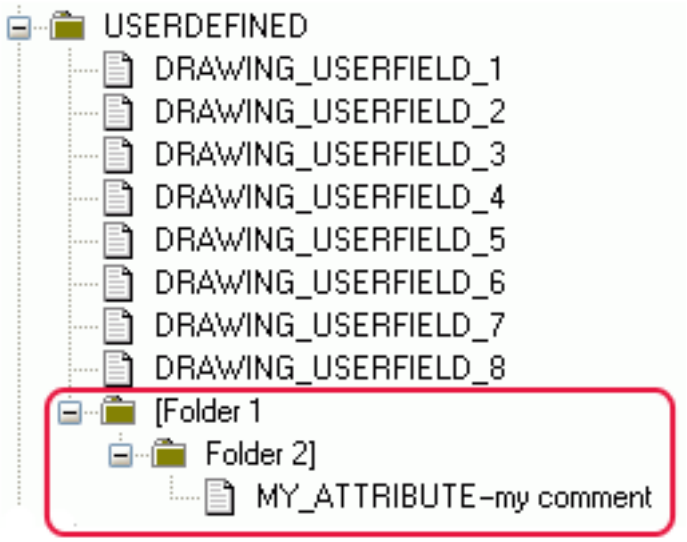
   For example, `MY_contentattributes_userdefined.lst`. Do not modify the original `contentattributes_userdefined.lst` file.
2. Scroll down to the list of attributes assigned to content types.
3. Define the hierarchy in square brackets, between `USERDEFINED.` and the attribute name.

   For example:

   ```
   DRAWING  = USERDEFINED.[Folder 1.Folder 2].MY_ATTRIBUTE "my comment"
   ```

   NOTE Ensure that you include the periods after the brackets and between the hierarchies.
4. Save the changes.

The new hierarchy is shown in the attribute tree:



Tips for templates

These tips can help you to use templates more efficiently.

Using type attributes in calculations

Change text to numeric format

```
double(GetValue("ASSEMBLY_TOP_LEVEL"))
```

Change into correct format for calculation (double=decimals)

```
format(double(GetValue("ASSEMBLY_TOP_LEVEL")),"Length", "mm",
1)
```

Add all above into calculation formula

```
format(double(GetValue("ASSEMBLY_TOP_LEVEL")),"Length", "mm",
1)+15000
```

Another example of the same for part elevation

```
(double(GetValue("TOP_LEVEL"))-
(double(GetValue("BOTTOM_LEVEL"))))*1000
```

Change value field content to use imperial units

Advanced option to check if imperial units are in use:

```
GetValue("ADVANCED_OPTION.XS_IMPERIAL")==TRUE
```

Translated string call for multi lingual text:

```
GetValue("TranslatedText("albl_Diameter_")")
```

Formatting of units:

```
format(GetValue("DIAMETER"),"Length","inch-frac", 1/16)
```

```
format(GetValue("DIAMETER"),"Length","mm", 1)
```

Combine all above in a rule:

```
if GetValue("ADVANCED_OPTION.XS_IMPERIAL")==TRUE then
```

```
GetValue("TranslatedText("albl_Diameter_")")+
format(GetValue("DIAMETER"),"Length","inch-frac", 1/16) + "
Inches"
```

```
else
```

```
GetValue("TranslatedText("albl_Diameter_")")+
format(GetValue("DIAMETER"),"Length","mm", 1)+" mm"
```

```
endif
```

Define customized date format

Use mid function to find year, month and day:

```
mid("","","") string, offset, n
```

year:

```
mid(format(GetValue("DATE"),"Date","dd.mm.yyyy", ),"6","4")
```

month:

```
mid(format(GetValue("DATE"),"Date","dd.mm.yyyy", ),"3","2")
```

days:

```
mid(format(GetValue("DATE"),"Date","dd.mm.yyyy", ),"0","2")
```

Combine all above in rule:

```
mid(format(GetValue("DATE"),"Date","dd.mm.yyyy", ),"6","4")
+"-"+
```

```
mid(format(GetValue("DATE"),"Date","dd.mm.yyyy", ),"3","2")
+"-"+
```

```
mid(format(GetValue("DATE"),"Date","dd.mm.yyyy", ),"0","2")
```

Assembly or cast unit drawing sheet number

Use match function to find "-" character

```
match(GetValue("NAME_BASE"),"*-*")
```

Use of mid function to return only characters after "-"

```
mid(GetValue("NAME_BASE"),(1+
(find(GetValue("NAME_BASE"),"-"))),2)
```

Combine all above in rule

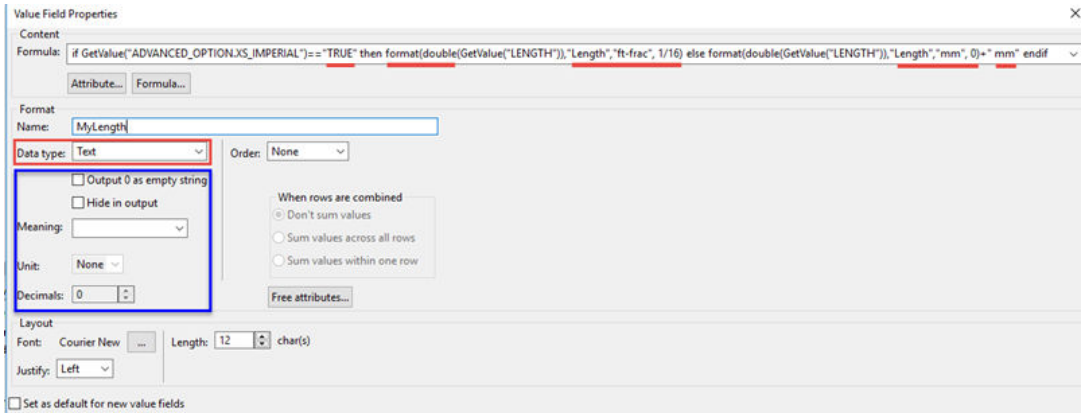
```
if (match(GetValue("NAME_BASE"),"*-*"))
then mid(GetValue("NAME_BASE"),(1+
(find(GetValue("NAME_BASE"),"-"))),2)
else ""
endif
```

Use format functions in value fields

You can define the format used in a value field in two ways: In the **Value Field Properties** dialog box by filling in the fields for **Datatype**, **Meaning**, **Unit** and **Decimals**, or by creating a formula in the **Formula** field. In formulas, you can use the format function that converts an attribute value to a formatted information string.

When you use a format function in a formula, always set the **Datatype** to **Text** in the **Value Field Properties** dialog box. Leave the other fields in the **Format** area empty.

For example, if you want to convert the attribute value to numbers with decimals in the report, you need to include the conversion function `double` in the format function:



The default values for unit and decimals are defined in the `contentattributes_global.lst` file. The format function converts the attribute value to a formatted information string on the basis of what you have defined in the format function. The format function overrides the definitions in the `contentattributes_global.lst` file and settings that you have defined in the **Format** area of **Value Field Properties** dialog box.

Example of the result in a report when you use the formula above:

```
Mesh Information:
Geometry Size: 4/4-150/150-2750*2000
```

```
Length: 9'-1/4"
Height: 6'-6 3/4"
```

Example of the result of the formula, when you use set the advanced option XS_IMPERIAL to FALSE instead of TRUE:

```
Mesh Information:
Geometry Size: 4/4-150/150-2750*2000
Length: 2750 mm
Height: 2000 mm
```

For a list of valid unit and precision strings, see the valuefieldclasses.lst file located in the ..\Program Files\Tekla Structures\<version>\bin\applications\Tekla\Tools\TplEd\settings folder. Do not make changes in this file. Below is an example of the file content, which may change between Tekla Structures versions.

```
//
-------------------------------------------------------------------------
-------------
//
// - Use only letters, numbers, slashes and underlines.
//
//
-------------------------------------------------------------------------
-------------
//
// Class                =        units { presicions }

Length                  =        mm, dm, cm, m, inch, ft, yd, inch-frac
{1/2, 1/4, 1/8, 1/16 }, ft-frac { 1/2, 1/4, 1/8, 1/16 }
Angle                   =        Degrees, radians
Area                    =        mm2, cm2, dm2, m2, sq.inch, sq.ft, sq.yd
Area/length             =        mm2/m, cm2/m, dm2/m, m2/m, in2/in,
in2/ft, ft2/ft, sq.yd/ft
Volume                  =        mm3, cm3, dm3, m3, cu.in, cu.ft, cu.yd
Weight                  =        kg, T, N, lbf, kip
Weight/length           =        kg/m, T/m, N/m, daN/m, kN/m, lbf/ft
Density                 =        kg/m3, T/m3, N/m3, kN/m3, lbf/ft3
Temperature             =        Kelvin, Celsius, Fahrenheit
Section_modulus         =        mm3, cm3, in3
Moment_of_inertia       =        mm4, cm4, in4
Warping_modulus         =        mm6, cm6, in6
Force                   =        kg, T, N, daN, kN, lbf, kip
Force/length            =        kg/m, T/m, N/m, daN/m, kN/m, lbf/in,
lbf/ft, kip/in, kip/ft
Force/area              =        kg/m, kg/cm, kg/mm, T/m, T/cm, T/mm, N/m,
N/cm, N/mm, daN/m, daN/cm, daN/mm, kN/m, kN/cm, kN/mm, lbf/in, lbf/ft,
kip/in, kip/ft
Moment                  =        kgm, Tm, Nm, daNm, kNm, lbf-in, lbf-ft,
kip-in, kip-ft
Moment/length           =        kgm/m, Tm/m, Nm/m, daNm/m, kNm/m, lbf-
ft/ft, kip-ft/ft
Stress                  =        kg/m2, kg/cm2, kg/mm2, T/m2, T/cm2, T/
mm2, N/m2, N/cm2, N/mm2, daN/m2, daN/cm2, daN/mm2, kN/m2, kN/cm2, kN/mm2,
psi, psf, ksi, ksf
Date                    =        dd.mm.yyyy, mm.dd.yyyy, mm/dd/yyyy,
yyyy/mm/dd, dd-mm-yy, dd-mm-yy, yyyy-mm-dd, dd/mm/yy
Time                    =        hh:mm:ss, hh:mm:ss:am/pm
Date&&Time              =        dd.mm.yyyy, mm.dd.yyyy, mm/dd/yyyy,
yyyy/mm/dd, dd-mm-yy, dd-mm-yyyy, yyyy-mm-dd, dd/mm/yy
Date_local              =        dd.mm.yyyy, mm.dd.yyyy, mm/dd/yyyy,
yyyy/mm/dd, dd-mm-yy, dd-mm-yyyy, yyyy-mm-dd, dd/mm/yy
Time_local              =        hh:mm:ss, hh:mm:ss:am/pm
```

```
Date&&Time_local        =        dd.mm.yyyy, mm.dd.yyyy, mm/dd/yyyy,
yyyy/mm/dd, dd-mm-yy, dd-mm-yyyy, yyyy-mm-dd, dd/mm/yyLeadingZeroes
LeadingZeroes
DistanceList            =        mm, dm, cm, m, inch, ft, yd, inch-frac
{1/2, 1/4, 1/8, 1/16 }, ft-frac { 1/2, 1/4, 1/8, 1/16 }
```

For more information about value fields, formats, format functions and other functions, see Template Editor User's Guide.

4.7 Set up a project for collaboration and interoperability

Collaborative modeling allows several people to simultaneously work in the same Tekla Structures model. Importing to and exporting from Tekla Structures allows you to use the same models and data in Tekla Structures and in other software and systems.

Checklist for interoperability

If you plan to use collaborative modeling, decide which method you will use.

- If your company takes part in external projects, or if more than one user works with the same model at different locations, we recommend using Tekla Model Sharing. For more information, see What is Tekla Model Sharing .
- If users do not need to work simultaneously with other users on the same model, or you only need to give others viewing access to the model, you can use Trimble Connect for model coordination and exchange of other project files. For more information, see Trimble Connector.

Set up a project for collaboration and interoperability

Collaborative modeling allows several people to simultaneously work in the same Tekla Structures model. Importing to and exporting from Tekla Structures allows you to use the same models and data in Tekla Structures and in other software and systems.

Collaborative modeling for administrators

You can use Tekla Model Sharing or Trimble Connect for collaborative modeling.

If your company takes part in external projects, or if more than one user works with the same model at different locations, we recommend using Tekla Model Sharing. For more information, see What is Tekla Model Sharing .

If users do not need to work simultaneously with other users on the same model, or you only need to give others viewing access to the model, you can

use Trimble Connect for model coordination and exchange of other project files. For more information, see Trimble Connector.

Management of Tekla Model Sharing

In Tekla Model Sharing each user has a local version of the model, and the model data is shared and synchronized over the internet using a cloud sharing service.

Status information for the Tekla Model Sharing cloud sharing service and other online services is available on the Tekla Online status page. On this page, you can also find information about service breaks.

When a user shares a model, the organization that the user belongs to becomes the model owner. In Tekla Model Sharing, an organization always owns all the models shared by the users in the organization. A shared model is always owned by only one organization.

You can view and manage the shared models owned by your organization with the Management Console for Tekla Model Sharing. For more information, see:

- Manage shared models in Management Console for Tekla Model Sharing
- Managing Tekla Model Sharing as an administrator

Use a Trimble Connect folder as the project or firm folder

When you need to set up a project folder `XS_PROJECT` or a firm folder `XS_FIRM` to be used in Tekla Model Sharing, the most convenient way to do this is to use a Trimble Connect project as the project or the firm folder.

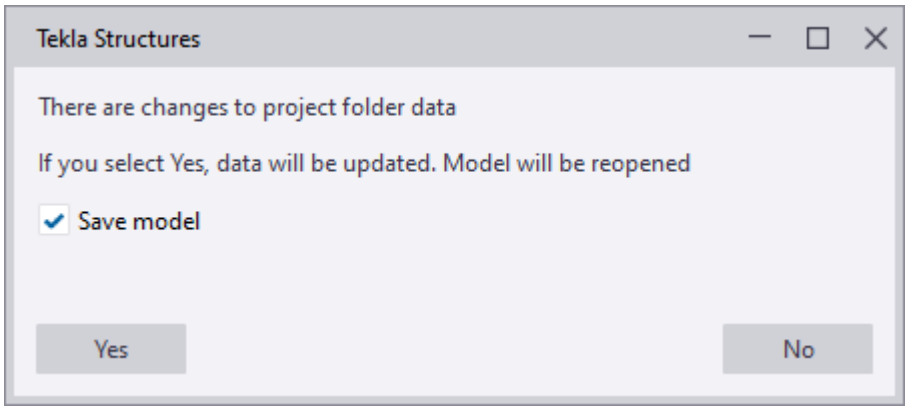
By using a Trimble Connect project as the project or firm folder, you ensure that all Tekla Model Sharing users always use the same settings and that the updates are automatically shared with everyone.

Note that all users need to have access both to the Trimble Connect project and to the Tekla Model Sharing model.

The project and firm folder information is only updated from the Trimble Connect project to local versions of the shared models, not vice versa. In practice, this means that Tekla Structures downloads new files from the project or film folder to the local model and updates any changed files. If a local file is not stored in the Trimble Connect project folder, the file is removed from the local model.

Tekla Structures uses Trimble Connect folder sync (`CONNECT_FOLDER_SYNC`) to synchronize the data.

When Tekla Structures detects a change between the local model data and the data in the Trimble Connect project or firm folder, you get the following notification:



If you click **Yes**, the model is saved and closed. Then, the local model data is updated and the model is re-opened.

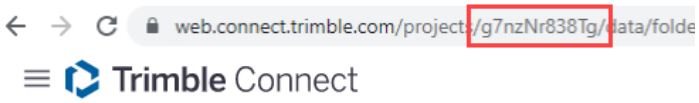
To set a folder in a Trimble Connect project as the `XS_PROJECT` or `XS_FIRM` folder:

1. Create a project in Trimble Connect, and the folders that you want to use as project or firm folders.

   Add the needed settings and files to the folders.

   For more detailed information on how to create the Trimble Connect project and folders, see How to use a Trimble Connect folder as the project or firm folder and Using Trimble Connect files in Tekla Structures.
2. In Tekla Structures, on the **File** menu, go to **Settings** --> **Advanced options**.
3. Depending on the option, do one of the following:

To set a Trimble Connect project folder as	Do this
The `XS_PROJECT` folder	a. In the **Advanced options** dialog box, find the `XS_PROJECT` option. b. Set the value of `XS_PROJECT` to `%CONNECT_FOLDER_SYNC%`. Tekla Structures searches for differences between the files in the Trimble Connect project folder and the local `..\Users\<user>\AppData\Local\Trimble\Tekla folder sync\<folder>` folder. If you use the same Trimble Connect project both as the `XS_PROJECT` folder and for collaboration, use a sub-folder in the `XS_PROJECT` folder, so that the `XS_PROJECT` folder is separated from the Trimble Connect collaboration information. Set

To set a Trimble Connect project folder as	Do this
	the sub-folder to `%CONNECT_FOLDER_SYNC%\<folder>\<sub-folder of the folder>`. For example, you could save the project folder under the `Project settings` folder with the name `Project`. In this example, the value should then be set to `%CONNECT_FOLDER_SYNC%\Project Settings\Project`. You can also use lower level sub-folders.
The `XS_FIRM` folder	a. In the **Advanced options** dialog box, find the `XS_FIRM` option. b. Set the value of `XS_FIRM` to `%CONNECT_FOLDER_SYNC%\<ProjectID>\<region>(\<folder>\<sub-folder of the folder>)`. You can see the project ID in Trimble Connect for Browser:  The region is the same as the project server location setting. The options are: • asia • europe • northAmerica For example, the value could be `%CONNECT_FOLDER_SYNC%\g7nzNr838Tg\europe` If you use the same Trimble Connect project both as the `XS_FIRM` folder and for collaboration, use a sub-folder in the `XS_FIRM` folder, so that the `XS_FIRM` folder is separated from the Trimble Connect collaboration information. Set the sub-folder to `%CONNECT_FOLDER_SYNC%\<ProjectID>\<region>\<folder>\<sub-folder of the folder>`. For example, you could save the project folder under the `Project settings` folder with the name `Project`. In this case, the value should be set to `%CONNECT_FOLDER_SYNC%`

To set a Trimble Connect project folder as	Do this
	`\g7nzNr838Tgeurope\Project Settings \Project`. You can also use lower level sub-folders.

4. Click **OK** to save the project or firm folder.
5. Close and re-open the model to take the new project or firm folder into use.

Note that files that are generated when macros are compiled (`cs.dll` and `.cs.pdb`) are ignored in the folder sync operation. Thus, adding these two files in the local folder will not trigger an update.

See also

Project and firm folders (page 16)

Install the Cache service for Tekla Model Sharing

Tekla Model Sharing Cache service downloads model data from the Tekla Model Sharing service and caches the data in the file system inside a LAN. Using the cache service reduces the use of the Internet, resulting in faster download times when the same data is requested more than once. Note that the cache is not used for packets that are written out.

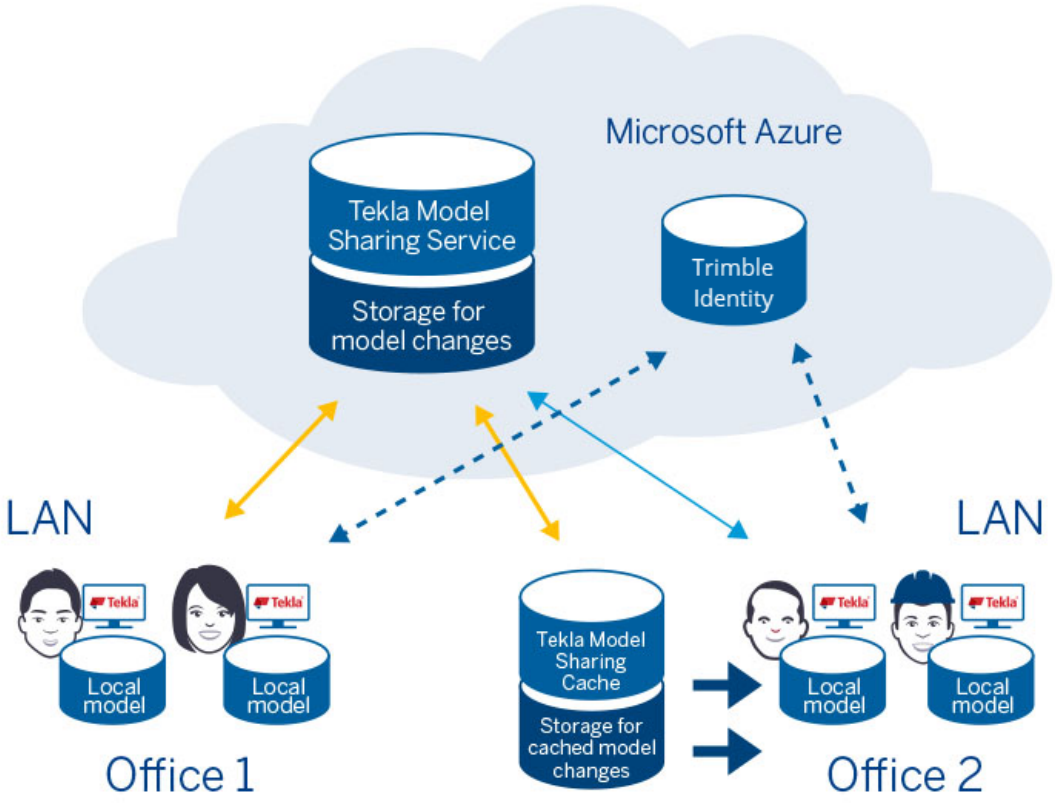
The cache service needs an Internet connection to download model data from the sharing service. The first time a user fetches a packet it will be loaded to the cache service. Any following requests to the same packet will then be served fast from the cache service inside the LAN.

The cache service is useful even if there is only one Tekla Model Sharing user in the same office. For example, rejoining a model is faster as the model data is available in the cache service. In addition, the model data is always loaded as small data blocks. This is useful if the downloading is interrupted for some reason, because the cache service can just download the missing blocks later.

Note that data is not automatically cleared from the Cache service. To clear unnecessary data, you can simply delete old files from the Cache service.

If there are several Tekla Model Sharing users in the same office, we highly recommend you to install the Tekla Model Sharing Cache service. The Cache service is recommended especially in regions where the download speed may be limited.

The image below shows how the model data is stored to the sharing service and used with the Tekla Model Sharing Cache service.



NOTE If the Cache service cannot be reached for any reason, Tekla Structures will use the cloud storage for model changes directly. This can also happen when a download operation is on-going, if the connection to Cache service times out.

You can see whether the Cache service is in use by checking the `ClientLog_cat.txtClientLog_dog.txt` log files in the `\Users\<user>\AppData\Local\Tekla DataSharing` folder.

Software and system requirements for a cache installation:

- Windows Server 2008 R2, or later
- .NET Framework 4.5.1

Install the Cache service

1. Ensure that you have an active Windows computer or a server with enough disk space to store the cached model data.
2. Download the Tekla Model Sharing Cache service installation file from Tekla Downloads.
3. Run the installation file and follow the steps in the installation wizard to complete the installation.

- The default cache folder is `C:\TeklaModelSharingCache`. If needed, you can change the folder destination.

  Ensure that the destination folder has enough disk space for the estimated usage of the service. The required disk space can vary from a few gigabytes to terabytes, depending on the amount of Tekla Model Sharing users and the size of the models.
- The default TCP/IP port number for the cache service is `9998`.

  Use this port number when you configure Tekla Structures client workstations to use the cache. This port is the main communication and control channel to the cache service.
- The default TCP/IP port number for internal communication is `9001`.

  This port is automatically fetched from the cache service, and it is used for the actual data transfer.

Network access

You need to allow inbound traffic for TCP/IP ports (defaults 9001 and 9998) for the cache service host.

If the ports cause conflicts or other problems because of other services or a firewall, you can change the ports to some other ports.

The cache service needs an Internet connection to download model changes from the sharing service.

NOTE If you later need to modify the installation, re-run the `TeklaModelSharingCacheService.exe` installation file and select **Repair**. You can then change the previously set cache folder or port numbers. To use content from the previous cache folder, copy or move the needed content to the new folder.

---

4. Check that the Tekla Model Sharing Cache service has started.
   - Locate **Tekla Model Sharing Cache** from the Windows services by using, for example, the Computer Management console `compmgmt.msc` or the Services management console `services.msc`.
   - Use Windows Event Viewer to verify that there are no errors from the service and that there are Information messages showing that the service has started.
5. Configure Tekla Structures client workstations to use the cache.

   In Tekla Structures, on the **File** menu, click **Sharing** --> **Sharing settings** .

   In the **Sharing settings** dialog box:
   - **Name** is the name of the computer on which the cache is installed. To check the computer name, click **Windows Control Panel** --> **System and Security** --> **System** .

- **Port** is the cache service port number that you have set when you installed the cache service. The default value is `9998`.

Troubleshoot the Cache service installation

Problem	Possible solutions
Cannot connect to the Cache service from Tekla Structures	• Ensure that the Tekla Model Sharing Windows Service is running. • Ensure sure that the firewalls do not block TCP/IP ports configured to Tekla Structures, for example `9001` or `9998` when you use the default ports.
Cache service does not start	Check the Windows Event Viewer's Application Log for errors.

Set the Log On account for the Cache Windows service

In case the Cache service needs to access some special resources, such as shared network drives, you need to ensure that the **Log On** account for the Cache Windows service has permissions to access those resources. Note that the **Log On** account also needs to have reading and writing permissions to the `C:\ProgramData\Tekla\ModelSharingCache` folder. We recommend that you use the same account both for installing the Cache service and, if needed, as the **Log On** account for the Cache Windows service.

By default, the **Log On** account for the Cache Windows service is **Local System Account**, so you may need to change the account:

1. Right-click the Cache Windows Service in the **Services** dialog box.
2. Select **Properties**.
3. On the **Log On** tab, select **This Account** and type the account name and password.
4. Click **OK**.

Host your own potree point cloud data

Hosting your own potree point cloud data allows you to share point clouds across the internet using a URL. We recommend hosting your potree point cloud data on a Microsoft Azure Storage Account.

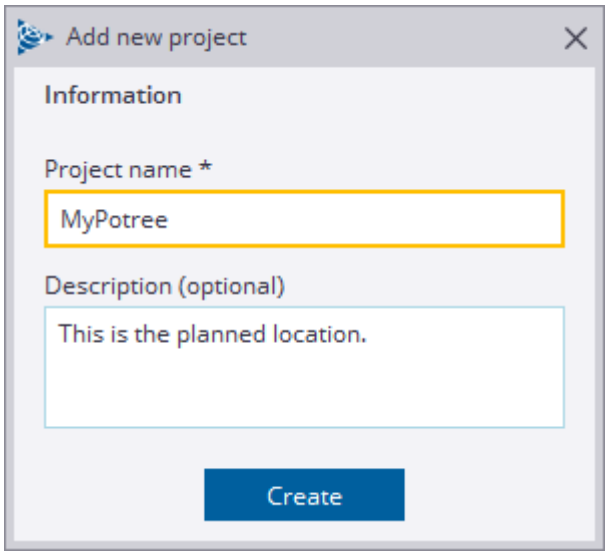
Create a potree file with Point cloud manager

You can download **Point cloud manager** from Tekla Warehouse.

For detailed instructions about using **Point cloud manager**, see the **Point cloud manager** help. You can open the help by clicking the help button .

1. Install the application, and start it from the start menu or start screen, depending on your Windows version.
2. Set the root folder for the project. For example, `C:\Trimble\PTRS`.
3. Create a new project.
   a. Click the **Add new project** button.

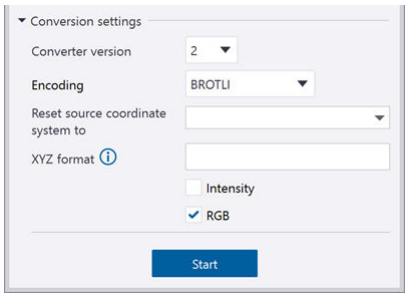
   b. In the **Project name** box, enter a name for the project.



   This name will be the name of the potree database and potree folder.
4. Import one or more point cloud models:
   a. Click **Add file**.
   b. Browse for the point cloud file.

5. When the point cloud has been imported, click 

to start the conversion to potree.
6. Expand **Conversion settings**, select **Directory structure**, then click **Start**.



The potree data is now available in the root folder for the project.

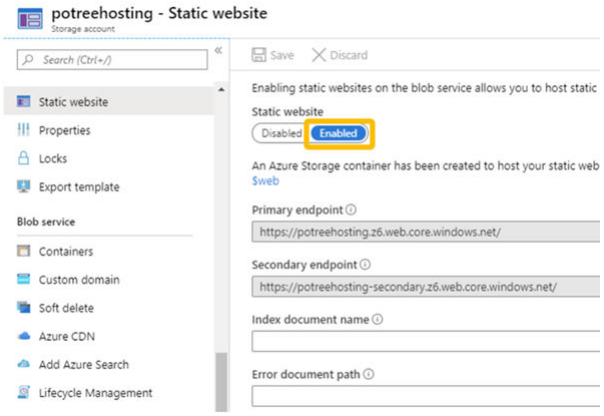
Configure an Azure Storage Account to host the point cloud data

A Microsoft Azure subscription is required.

Before you begin, configure the security controls for your Azure subscription according to your organization's policies.

1. In the Azure Portal, create a new Azure storage account.

   For detailed instructions, see the Microsoft Azure documentation.
2. In the **Static website** settings, enable Static website.



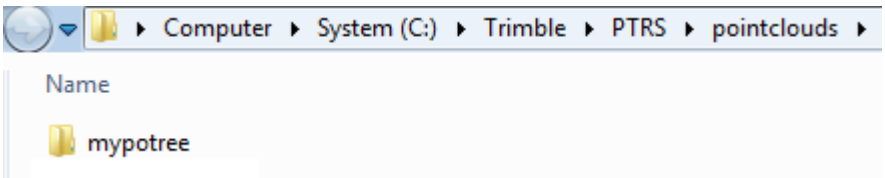
TIP The URLs in the **Primary endpoint** and **Secondary endpoint** boxes are generated automatically.

3. In the **CORS** settings, add a CORS rule for the **Blob service**, then configure the rule settings.

CORS rule setting	Description
Allowed origins	Specifies which domains are allowed to access the resources. • If you only plan to use the data from your point cloud with the Connect 3D app, enter https://3d.connect.trimble.com. • To allow all domains, enter `*`.
Allowed methods	Specifies which HTTP methods are allowed when making requests. Enter `GET`.
Allowed headers	Specifies which HTTP headers are allowed when making requests. To allow all headers, enter `*`.
Exposed headers	Specifies which headers JavaScript in browsers is allowed to access. To allow all headers, enter `*`.
Max age	Specifies how long the results of a request can be cached. Enter the number of seconds.

Upload potree data to your Azure Storage Account

1. In Azure Storage Explorer, navigate to your storage account, then browse to the **$web** blob container.
2. Copy the folder that contains the point clouds from `C:\Trimble\PTRS` to the storage for your blob container.
3. Copy the `<potree_name>` folder to a shared location.



NOTE Do not replace existing potree data, especially if it is used by other users.

Add a link to your point cloud data to your Trimble Connect Project

Add a point cloud URL from your computer or a drive.

1. Open your project in Trimble Connect for Windows.

2. Navigate to the 3D Viewer.
3. Open the **Point Clouds** panel.
4. Click **Add URL**.
5. Enter a name for the point cloud.
6. In the **URL** box, enter or paste the URL of the point cloud file.

   For example:

```
https://potreehosting.z6.web.core.windows.net/pointclouds/example
```

7. Click **Add**.

When you click this file in the Trimble Connect 3D app, your point cloud opens.

Files for import and export

You can use several different file type to import to and export from Tekla Structures.

See also

Conversion files (page 192)

Create new property sets for IFC export (page 196)

DSTV file description (page 210)

tekla_dstv2dxf_<env>.def file description (page 212)

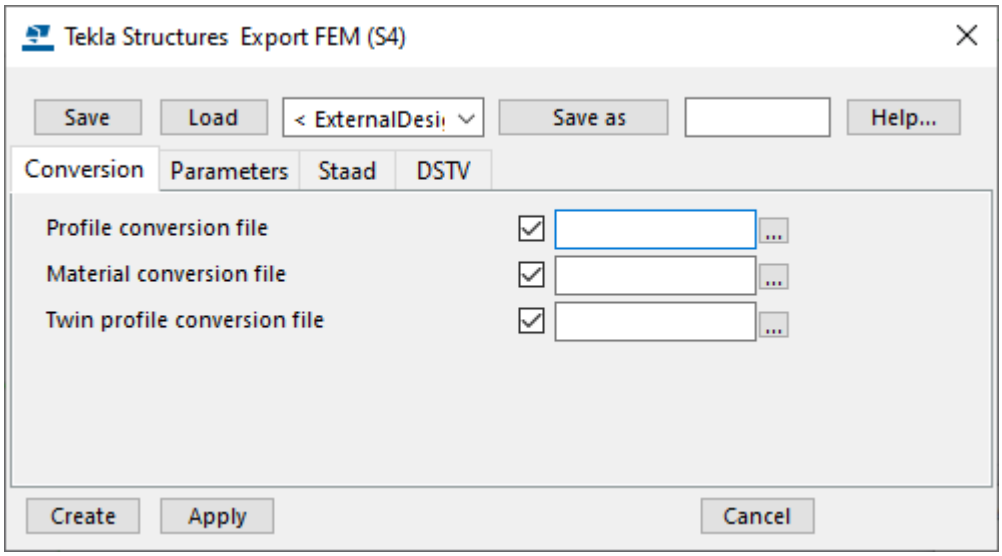
ASCII file description (page 222)

Conversion files

Conversion files (.cnv) map Tekla Structures profile, twin profile, and material names with names used in other software.

Conversion files are simple text files, containing the Tekla Structures name in the first column, and the name used in the other software package in the second column. Columns are separated by a space. All parametric profiles must be entered in the profile conversion file.

You can use the same conversion file both when importing and exporting models, and you can specify the location of conversion files in most of the import and export tools.



If you enter a conversion file name without a path, Tekla Structures searches for the file in the current model folder. If you leave the box empty, Tekla Structures searches for the file indicated by the advanced option `XS_PROFDB` in **File menu** --> **Settings** --> **Advanced options** --> **File locations** . This is also the case, if the tool does not allow you to define the path and conversion file.

Tekla Structures has several conversion files in the standard installation, and you can also create your own. Standard conversion files are located in the `\profil` folder under the environment folder `...\ProgramData\Trimble\Tekla Structures\<version>\environments\` folder. The exact location may vary depending on your environment. All conversion files have the `.cnv` extension.

Note that these instructions do not apply to all export and import types. If a tool has specific instructions regarding the conversion files, the instructions are included in the export or import instructions.

Create conversion files

You can create your own conversion files if the ones that come with Tekla Structures installation do not suit your needs.

1. Open an existing conversion file using any standard text editor.

   By default, conversion files are located in the `\profil` folder under the environment folder `...\ProgramData\Trimble\Tekla Structures\<version>\environments\`. The exact location may vary depending on your environment.

2. Save the file with another name.

   If the export/import tool allows you to define the path to the conversion file, you can save the file where you like. If this is not the case, save the file in a location defined by the advanced option `XS_PROFDB` in **File menu** --> **Settings** --> **Advanced options** --> **File locations** .

3. Modify the file: enter profile names recognized by Tekla Structures in the first column, and the corresponding name recognized by the other software in the second column.

   While modifying, ensure that:

   - You do not have blank material definitions (" ", empty quotation marks).
   - You do not have spaces in the profile position strings. For example, enter "Hand_ Rail" not Hand Rail".

4. Save your changes.

NOTE
- All the three files (profile, twin profile and material) are not needed if the differences in the profile name is just concerning * X or x formats, because these are normally handled automatically. For example, if you wanted to import UC254x254x73 to be UC254*254*73, the lower case "x" is automatically changed to "X" so the format of the conversion file would be UC254*254*73 254X254X73.
- If you have problems importing the model, check any error messages in the Tekla Structures log file, and check the conversion files.

Example

Below are some examples of conversion files:

SDNF

```
! Profile name conversion Tekla Structures -> SDNF
!
! If Converted-name does not exist, it will be the same
! as Tekla Structures-name.

! Tekla Structures-name Converted-name

C10X15.3 C10X15.3
C10X20 C10X20
C10X25 C10X25
C10X30 C10X30
C12X20.7 C12X20.7
C12X25 C12X25
C12X30 C12X30
```

```
C15X33.9 C15X33.9
C15X40 C15X40
C15X50 C15X50
C3X4.1 3X4.1
```

DSTV

```
! Profile name conversion Tekla Structures -> DSTV
!
! If Converted-name does not exist, it will be the same
! as Tekla Structures-name.

! Tekla Structures-name Converted-name

C10X15.3  C10X15.3
C10X20    C10X20
C10X25    C10X25
C10X30    C10X30
C12X20.7  C12X20.7
C12X25    C12X25
```

Below there is first an example of an incorrect conversion file and then of a correct one, errors are highlighted:

```
00100782 4 0 2 "brace" "Tread 4" 1 "TREAD4.5" "" 0.000000 0 0
0.000000 1.000000 0.000000 16.250000 13.154267 3.857143
15.500000 13.154267 3.857143 0.000000 0.000000 0.000000
0.000000 0.000000 0.000000 0.000000 0.000000 0.000000
0.000000 0 0 0 0 0 0 0 0 0 0 0 0
```

```
00100782 4 0 2 "brace" "Tread_4" 1 "TREAD4.5" "A36" 0.000000
0 0 0.000000 1.000000 0.000000 16.250000 13.154267 3.857143
15.500000 13.154267 3.857143 0.000000 0.000000 0.000000
0.000000 0.000000 0.000000 0.000000 0.000000 0.000000
0.000000 0 0 0 0 0 0 0 0 0 0 0 0
```

Twin profile conversion files

Tekla Structures contains separate conversion files for twin profiles, and it reads the twin profile conversion file before the profile conversion file, so you must include the profiles from the original model in the import.

The twin profile conversion file is a text file containing the profile prefix (characters only) and the distance between the profiles in mm, separated by a

space. Tekla Structures converts all profiles with the specified prefix to twin profiles.

The twin profile conversion file could be named `twin_profiles.cnv` and it could contain lines such as the one below:

```
DL 20
```

The distance between the profiles is the same for all profiles with the same profile prefix. For example, profiles with the prefix DL will always have the same spacing. If you want different spacing values, then you need to use a different profile prefix.

You also need to add the twin profile to the profile conversion file to get the DL profile converted to L-profile:

```
L200*20 DL200/20-20
```

Limitations

- Twin profile conversion cannot be used for profiles that start with a number. This means that you cannot define double angles as 2L. Instead, you need to use DL as the prefix for a twin profile, for example: `DL200/20-20`.
- Twin profile conversion does not work for FEM import. We recommend that each angle is modeled separately rather than as twin profiles, as SP3D does not control the gaps between members in the same way as Tekla Structures and there are, for example, various conversion and mapping difficulties. Ii is easier to convert members that are modeled as two members.

Create new property sets for IFC export

You can create additional property sets from template attributes and user-defined attributes, define properties for the attributes, and bind the Tekla Structures property sets to IFC entities for IFC export.

Tekla Structures saves additional property sets in configuration files. You can keep several configuration files in several locations. When Tekla Structures exports an IFC file, it reads the predefined property sets and the additional property sets.

Add an IFC property set configuration file

1. On the **File** menu, click **Export** --> **IFC** or **Export** --> **IFC4**.
2. In the **Additional property sets** list, select **<new>**, then click **Edit**.

   The **Property Set Definitions** dialog box opens.
3. In the **Property set configuration file name** box, enter a name for the configuration file.

4. To add a new property set, click the add button  under **Property Set**.

   You can create several property sets in one configuration file. For example, you can add COGs, and start and end points on the part level, and scheduling information on the assembly level.

5. In the dialog box that opens, enter a name and a description for the property set, then click **Create**.

   The property set name can contain any text, including spaces. The maximum length of the property set name is 255 characters. The "Pset_" prefix is reserved for the standard BuildingSMART property sets. Do not use this prefix in the name of your custom property sets.

6. In the **Entities** list, select the entity type category.

   Structural is the default category. When you select the category, the related IFC entities are shown in the **Select entity types** list.

7. From the **Select entity types** list, select an entity type.

   The **Select attributes** list shows the attributes that are available for the selected entity type.

8. From the **Select attributes** list, select one or more attributes.

   The attribute is added to the **List of all selected properties** list on the right. This list shows which attributes are exported:

   - When you select an attribute in the list, its properties are shown under **Create/Modify property**.
   - You can add new attributes by entering an attribute name in the **Attribute** box in the **Create/Modify property** area and clicking the **Add** button.
   - You can modify and remove attributes on the list by selecting the attributes on the list and clicking **Modify** or **Remove**.

9. Under **Create/Modify property**, define the attribute properties.

   a. Select **Property type** for the selected attribute.

      Here, always select **Template attribute** for user-defined attributes whose name contains more than 19 characters. For example, select **Template attribute** for `ASSEMBLY.USERDEFINED.PLANS_STATUS`.

   b. Enter the name of the selected attribute in the **Name** box.

   c. Select the **Type** of the attribute.

      The **Type** can be one of the following:

      - **String**: sequence of characters
      - **Boolean**: true or false
      - **Integer**: a whole number

- **Measurement**
- **Real**: a number that has a decimal representation
- **Time stamp**

d. If the type of the user-defined attribute is **Measurement**:

- You can select the **Measurement type**: **Length**, **Area**, **Volume**, **Mass**, **Positive length** or **Count**.
- You can select the **Conversion** factor and **Accuracy**.

  To be able to define the value for **Conversion**, you need to know the unit used for a particular property (for example length) in Tekla Structures and the unit used for the property in IFC. For example, for length, the unit is mm in both Tekla Structures and IFC, which means that the conversion value is 1. If the unit was m in Tekla Structures, the conversion value would need to be 1000.

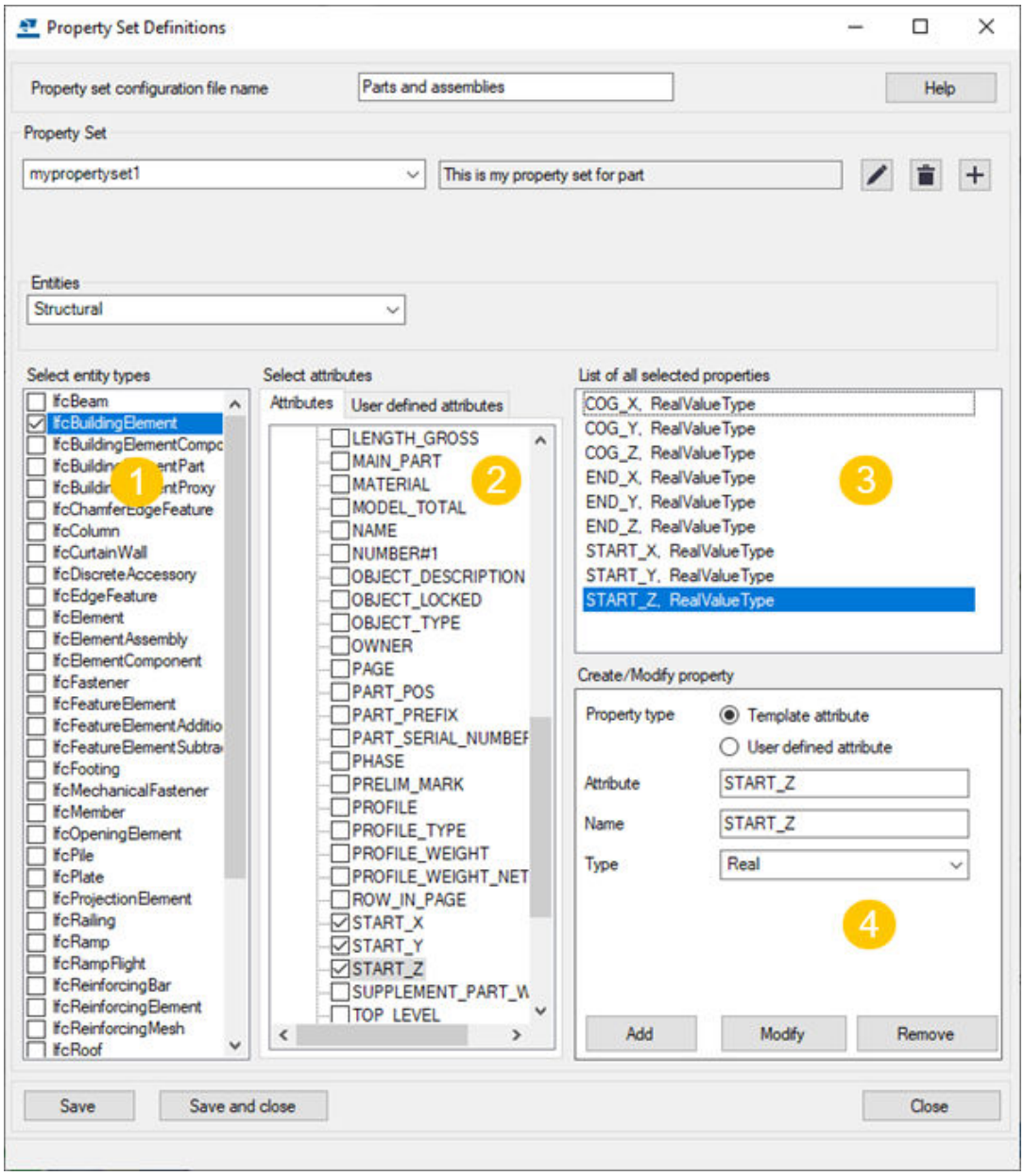
  In the area property conversion, the 1E-06 factor is used, and 1E-06 = 0.000001. For example, 1 m^2 is 1000000 mm^2 in Tekla Structures. In IFC, the area unit is m^2, and the Tekla Structures value needs to be converted by 1E-06: 1000000 mm^2 x 1E-6= 1 m^2.

  In the volume property conversion, the 1E-09 factor is used, and 1E-09 = 0.000000001.

  Accuracy indicates the accuracy that is used when writing the property to IFC, decimals are used here. For example with length, when accuracy is 0.1, with a 1000 mm IFC file the value would be 1000.0. If accuracy was 0.01, the value would be 1000.00. If the accuracy was 0.5, the Tekla Structures value 1000.6 would be 1000.5, 1000.8 would be 1001.0, and 1000.2 would be 1000.0.

  User-definable accuracy allows better IFC file size optimization.

10. Click **Save**.



1) The entity groups where Tekla Structures attributes are written in the exported IFC file

2) The template attributes or user-defined attributes that you want to export for the selected entity

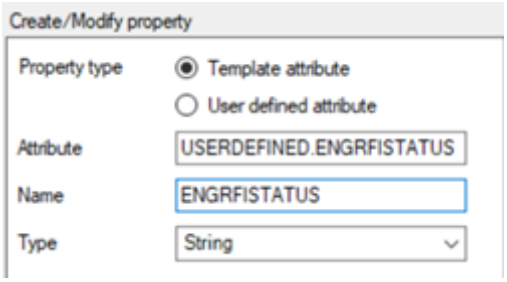
3) List showing the selected attributes

4) The properties that you can define for the attributes

TIP Be careful to select the correct **Type** when defining property sets from UDAs. For example, if the UDA properties are normal text, select **String**. If your UDA properties are whole numbers, select **Integer**. If the wrong **Type** is selected, the property set export will fail. Note that you can get a string value for a user-

defined attribute so that you add the prefix `USERDEFINED.` to the user-defined attribute, change the **Property type** to **Template attribute** and the **Type** to **String**.

Example:



Predefined property set configuration files in IFC2x3 export

The predefined configuration files are read-only and they are read from `..\ProgramData\Trimble\Tekla Structures\<version>\Environments\Common\inp`. The location may vary depending on your environment.

- `IfcPropertySetConfigurations_CV2.xml` (default property sets)/ `IfcPropertySetConfigurations_CV2_1.xml` (minimum property sets) contains the property sets for **Export type Coordination view 2.0**.
- `IfcPropertySetConfigurations_SG.xml` (default property sets)/ `IfcPropertySetConfigurations_CV2_1.xml` (minimum property sets) contains the property sets for **Export type Surface geometry**.
- `IfcPropertySetConfigurations_AISC.xml` (default property sets)/ `IfcPropertySetConfigurations_AISC_1.xml` (minimum property sets) contains the property sets for **Export type Steel fabrication view**.

The `IfcPropertySetConfigurations_CV1.xsd` file in the same folder is a schema file that describes the structure of the XML file and is used for validation of the XML file. This file is read when the software is started.

Additional property set configuration files in IFC2x3 and IFC4 export

NOTE We recommend that you define additional property sets in the **Property Set Definitions** dialog box instead of modifying the file itself to ensure that the XML configuration files are valid. The additional property sets you create are saved to the `\AdditionalPSets` folder under the model folder by default. You can also read additional property sets from the following folders:

- `XS_SYSTEM`
- `XS_PROJECT`
- `XS_FIRM`

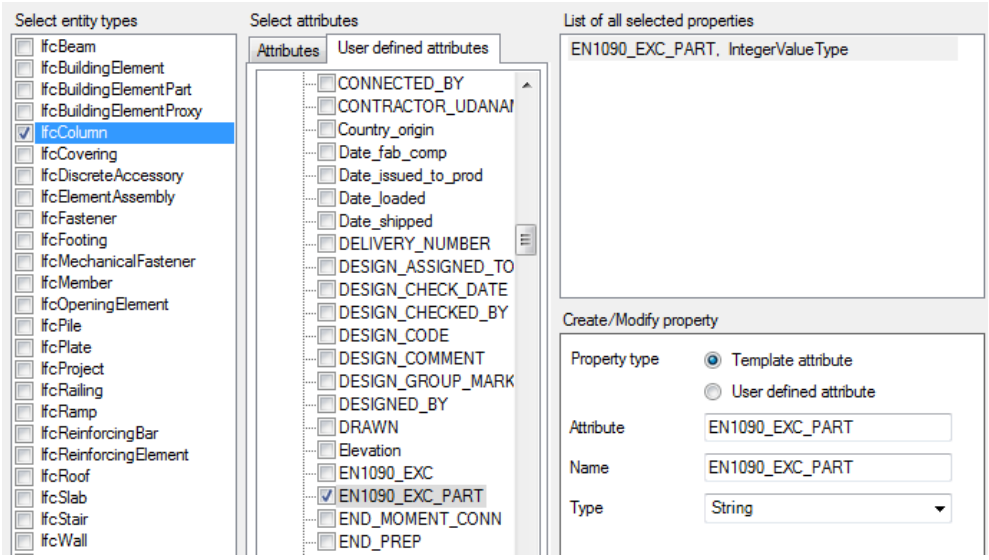
You can define your own property sets for both IFC2x3 export and IFC4 export. When you configure property sets for IFC export in XML format, you need two files:

- `IfcPropertySetConfigurations.xsd` is a schema file that describes the structure of the XML file and is used for validation of the XML file. This file is read when the software is started.
- `IfcPropertySetConfigurations.xml` is the actual property set configuration file.

If you use the above mentioned folders, save the files in a folder called `\AdditionalPSets` under the system, project or firm folder.

Property set configuration file contents
A configuration file includes the structure of property sets, and the data definitions for the properties inside the property sets.

- - Template attribute or UDA name. Template attributes are read from `contentattributes_global.lst` and the user-defined attributes from the environment database.
  - Data type, such as String, Integer, Float, Timestamp, Boolean, Logical, or planeanglemeasure.
  - Unit type, such as length, area, volume, or mass.
  - Unit value scaling of unitless UDA values. Conversion factor is added so that unitless values can be converted to correspond to the global units used in the IFC files. Area and volume units need these factors.
  - If you need the option type UDA value to be the same as in the user interface, you can change the type from **User defined attribute** to string type **Template attribute** in **Property Set Definitions** dialog box.



  - Possibility to use default values.

    - Possibility to ignore the set to export if template attribute or UDA does not have a value.
- A configuration file includes property set binding rules to IFC entities:
    - Binding to IFC entity type hierarchy including support for not only building elements but also for bolts, reinforcing bars, and assemblies.
    - Possibility to use limiting rules, such as Equal, NotEqual, LessThan, GreaterThan, LessThanOrEqual, and GreaterThanOrEqual for numbers, and Equal and NotEqual for texts.

      You need to modify your additional property set configuration file using a suitable editor, if you want to add these limiting rules.
    - There can be any number of binding rules for any property set, but only one property set definition for each `ReferenceId`.
    - You can bind different property sets to different IFC entity types. For example, a plate may have a different property set than a beam.
- If no value is found for a property in export, the export does not write the property set at all. To avoid this, add `optional=true` for that property in the property set.

Below is an example of the contents of the `IfcPropertySetConfigurations_CV2.xml` file.

```
<!-- assemblies -->
    <PropertySet referenceId="assemblies">
      <Name>Tekla Assembly</Name>
      <Description>Assembly Properties</Description>
      <Properties>
        <Property xsi:type="PropertySingleValueType" optional="true">
          <Name>Assembly/Cast unit Mark</Name>
          <PropertyValue xsi:type="StringValueType" stringType="IfcLabel">
            <GetValue xsi:type="TemplateVariableType">
              <TemplateName>ASSEMBLY_POS</TemplateName>
            </GetValue>
          </PropertyValue>
        </Property>
        <Property xsi:type="PropertySingleValueType" optional="true">
          <Name>Assembly/Cast unit position code</Name>
          <PropertyValue xsi:type="StringValueType" stringType="IfcLabel">
            <GetValue xsi:type="TemplateVariableType">
              <TemplateName>ASSEMBLY_POSITION_CODE</TemplateName>
            </GetValue>
          </PropertyValue>
        </Property>     <Property xsi:type="PropertySingleValueType" optional="true">
          <Name>Assembly/Cast unit name</Name>
          <PropertyValue xsi:type="StringValueType" stringType="IfcLabel">
            <GetValue xsi:type="TemplateVariableType">
              <TemplateName>ASSEMBLY_NAME</TemplateName>
            </GetValue>
          </PropertyValue>
        </Property>
```

Below is an example of the contents of the `IfcPropertySetConfigurations.xml` file.

```
- <PropertySetBind referenceId="simpleOptional">
  - <Rules>
    - <Include subtypes="true" entityType="IfcFooting">
      - <Where>
            <!-- Multible constraints are also possible. Using multible include rules alows optional constraints sets -->
            <!-- E.g., Any footing that is not made of concrete and has user defined field 1 set between 2 and 3, OR any
            footing that field 1 set to 1 and has user defined field 2 set between 0 and 42, except 10. -->
        - <Compare comparisonOperator="LessThan" xsi:type="IntegerCompareType">
          - <GetValue xsi:type="TemplateVariableType">
              <TemplateName>USER_FIELD_1</TemplateName>
            </GetValue>
            <ReferenceValue>4</ReferenceValue>
          </Compare>
        - <Compare comparisonOperator="GreaterThan" xsi:type="IntegerCompareType">
          - <GetValue xsi:type="UdaVariableType">
              <UdaName>USER_FIELD_1</UdaName>
            </GetValue>
            <ReferenceValue>1</ReferenceValue>
          </Compare>
        - <Compare comparisonOperator="NotEqual" xsi:type="StringCompareType">
          - <GetValue xsi:type="TemplateVariableType">
              <TemplateName>MATERIAL_TYPE</TemplateName>
            </GetValue>
            <ReferenceValue>CONCRETE</ReferenceValue>
          </Compare>
        </Where>
      </Include>
    - <Include subtypes="true" entityType="IfcFooting">
      - <Where>
        - <Compare comparisonOperator="Equal" xsi:type="IntegerCompareType">
          - <GetValue xsi:type="UdaVariableType">
              <UdaName>USER_FIELD_1</UdaName>
            </GetValue>
            <ReferenceValue>1</ReferenceValue>
          </Compare>
        - <Compare comparisonOperator="LessThanOrEqual" xsi:type="IntegerCompareType">
          - <GetValue xsi:type="UdaVariableType">
              <UdaName>USER_FIELD_2</UdaName>
            </GetValue>
            <ReferenceValue>42</ReferenceValue>
          </Compare>
        - <Compare comparisonOperator="GreaterThanOrEqual" xsi:type="IntegerCompareType">
          - <GetValue xsi:type="UdaVariableType">
              <UdaName>USER_FIELD_2</UdaName>
            </GetValue>
            <ReferenceValue>0</ReferenceValue>
          </Compare>
        - <Compare comparisonOperator="NotEqual" xsi:type="IntegerCompareType">
          - <GetValue xsi:type="UdaVariableType">
              <UdaName>USER_FIELD_2</UdaName>
            </GetValue>
            <ReferenceValue>10</ReferenceValue>
          </Compare>
        </Where>
      </Include>
    </Rules>
  </PropertySetBind>
```

Hardcoded IFC4 properties and quantities

In the IFC4 export, the exported properties and quantities are hardcoded. These properties and quantities are exported by default.

```
/*! Hard coded IfcBeam properties */
    { ENTITY_IfcBeam, Pset_BeamCommon {
        Quantity(Quantity::Enum, L"Status",
L"USERDEFINED.RENOVATION_STATUS"),
        Quantity(Quantity::Boolean, L"IsExternal",
L"USERDEFINED.IS_EXTERNAL"),
        Quantity(Quantity::Boolean, L"LoadBearing",
L"USERDEFINED.LOAD_BEARING"),
        Quantity(Quantity::Identifier, L"Reference",
L"USERDEFINED.REF_ID"),
        Quantity(Quantity::Label, L"FireRating",
L"USERDEFINED.FIRE_RATING"),
```

```
        Quantity(Quantity::Angle, L"Slope", L"SLOPE"),
        Quantity(Quantity::Angle, L"Roll", L"ROLL"),
        Quantity(Quantity::PositiveLength, L"Span", L"USERDEFINED.SPAN"),
        Quantity(Quantity::Thermal, L"ThermalTransmittance",
L"USERDEFINED.THERMAL_TRANSMITTAN") }
    },
    /*! Hard coded IfcBuildingElementProxy properties */
    { ENTITY_IfcBuildingElementProxy, Pset_BuildingElementProxymCommon  {
        Quantity(Quantity::Enum, L"Status",
L"USERDEFINED.RENOVATION_STATUS"),
        Quantity(Quantity::Identifier, L"Reference",
L"USERDEFINED.REF_ID"),
        Quantity(Quantity::Boolean, L"IsExternal",
L"USERDEFINED.IS_EXTERNAL"),
        Quantity(Quantity::Thermal, L"ThermalTransmittance",
L"USERDEFINED.THERMAL_TRANSMITTAN"),
        Quantity(Quantity::Boolean, L"LoadBearing",
L"USERDEFINED.LOAD_BEARING"),
        Quantity(Quantity::Label, L"FireRating",
L"USERDEFINED.FIRE_RATING")}
    },
    /*! Hard coded IfcMember properties */
    { ENTITY_IfcMember, Pset_MemberCommon  {
        Quantity(Quantity::Enum, L"Status",
L"USERDEFINED.RENOVATION_STATUS"),
        Quantity(Quantity::Boolean, L"IsExternal",
L"USERDEFINED.IS_EXTERNAL"),
        Quantity(Quantity::Boolean, L"LoadBearing",
L"USERDEFINED.LOAD_BEARING"),
        Quantity(Quantity::Identifier, L"Reference",
L"USERDEFINED.REF_ID"),
        Quantity(Quantity::Label, L"FireRating",
L"USERDEFINED.FIRE_RATING"),
        Quantity(Quantity::Angle, L"Slope", L"SLOPE"),
        Quantity(Quantity::Angle, L"Roll", L"ROLL"),
        Quantity(Quantity::PositiveLength, L"Span", L"USERDEFINED.SPAN"),
        Quantity(Quantity::Thermal, L"ThermalTransmittance",
L"USERDEFINED.THERMAL_TRANSMITTAN") }
    },
    /*! Hard coded IfcColumn properties */
    { ENTITY_IfcColumn, Pset_ColumnCommon   {
        Quantity(Quantity::Enum, L"Status",
L"USERDEFINED.RENOVATION_STATUS"),
        Quantity(Quantity::Boolean, L"IsExternal",
L"USERDEFINED.IS_EXTERNAL"),
        Quantity(Quantity::Boolean, L"LoadBearing",
L"USERDEFINED.LOAD_BEARING"),
        Quantity(Quantity::Identifier, L"Reference",
L"USERDEFINED.REF_ID"),
        Quantity(Quantity::Label, L"FireRating",
L"USERDEFINED.FIRE_RATING"),
        Quantity(Quantity::Angle, L"Slope", L"SLOPE"),
        Quantity(Quantity::Angle, L"Roll", L"ROLL"),
        Quantity(Quantity::Thermal, L"ThermalTransmittance",
L"USERDEFINED.THERMAL_TRANSMITTAN") }
    },
    /*! Hard coded IfcPile properties */
    { ENTITY_IfcPile, Pset_PileCommon    {
        Quantity(Quantity::Enum, L"Status",
L"USERDEFINED.RENOVATION_STATUS"),
        Quantity(Quantity::Boolean, L"LoadBearing",
L"USERDEFINED.LOAD_BEARING"),
        Quantity(Quantity::Identifier, L"Reference",
L"USERDEFINED.REF_ID") }
    },
    /*! Hard coded IfcFooting properties */
    { ENTITY_IfcFooting, Pset_FootingCommon     {
```

```
        Quantity(Quantity::Enum, L"Status",
L"USERDEFINED.RENOVATION_STATUS"),
        Quantity(Quantity::Boolean, L"LoadBearing",
L"USERDEFINED.LOAD_BEARING"),
        Quantity(Quantity::Identifier, L"Reference",
L"USERDEFINED.REF_ID") }
    },
    /*! Hard coded IfcElementAssembly properties */
    { ENTITY_IfcElementAssembly, Pset_ElementAssemblyCommon {
        Quantity(Quantity::Enum, L"Status",
L"USERDEFINED.RENOVATION_STATUS"),
        Quantity(Quantity::Identifier, L"Reference", L"ASSEMBLY_POS") }
    },
    /*! Hard coded IfcSlab properties */
    { ENTITY_IfcSlab, Pset_SlabCommon  {
        Quantity(Quantity::Identifier, L"Reference",
L"USERDEFINED.REF_ID"),
        Quantity(Quantity::Label, L"AcousticRating",
L"USERDEFINED.ACOUSTIC_RATING"),
        Quantity(Quantity::Boolean, L"IsExternal",
L"USERDEFINED.IS_EXTERNAL"),
        Quantity(Quantity::Boolean, L"LoadBearing",
L"USERDEFINED.LOAD_BEARING"),
        Quantity(Quantity::Enum, L"Status",
L"USERDEFINED.RENOVATION_STATUS"),
        Quantity(Quantity::Angle, L"PitchAngle",
L"USERDEFINED.PITCH_ANGLE"),
        Quantity(Quantity::Boolean, L"Combustible",
L"USERDEFINED.COMBUSTIBLE"),
        Quantity(Quantity::Label, L"SurfaceSpreadOfFlame",
L"USERDEFINED.SPREAD_OF_FLAME"),
        Quantity(Quantity::Label, L"FireRating",
L"USERDEFINED.FIRE_RATING"),
        Quantity(Quantity::Boolean, L"Compartmentation",
L"USERDEFINED.COMPARTMENT"),
        Quantity(Quantity::Thermal, L"ThermalTransmittance",
L"USERDEFINED.THERMAL_TRANSMITTAN") }
    },
        /*! Hard coded IfcRoof properties */
    { ENTITY_IfcRoof, Pset_RoofCommon   {
        Quantity(Quantity::Identifier, L"Reference",
L"USERDEFINED.REF_ID"),
        Quantity(Quantity::Enum, L"Status",
L"USERDEFINED.RENOVATION_STATUS"),
        Quantity(Quantity::Label, L"AcousticRating",
L"USERDEFINED.ACOUSTIC_RATING"),
        Quantity(Quantity::Boolean, L"IsExternal",
L"USERDEFINED.IS_EXTERNAL"),
        Quantity(Quantity::Boolean, L"LoadBearing",
L"USERDEFINED.LOAD_BEARING"),
        Quantity(Quantity::Label, L"FireRating",
L"USERDEFINED.FIRE_RATING"),
        Quantity(Quantity::Thermal, L"ThermalTransmittance",
L"USERDEFINED.THERMAL_TRANSMITTAN") }
    },
    /*! Hard coded IfcWall properties */
    { ENTITY_IfcWall, Pset_WallCommon    {
       Quantity(Quantity::Identifier, L"Reference",
L"USERDEFINED.REF_ID"),
       Quantity(Quantity::Enum, L"Status",
L"USERDEFINED.RENOVATION_STATUS"),
       Quantity(Quantity::Label, L"AcousticRating",
L"USERDEFINED.ACOUSTIC_RATING"),
       Quantity(Quantity::Label, L"FireRating",
L"USERDEFINED.FIRE_RATING"),
       Quantity(Quantity::Boolean, L"IsExternal",
L"USERDEFINED.IS_EXTERNAL"),
```

```
       Quantity(Quantity::Boolean, L"LoadBearing",
L"USERDEFINED.LOAD_BEARING"),
       Quantity(Quantity::Boolean, L"Combustible",
L"USERDEFINED.COMBUSTIBLE"),
       Quantity(Quantity::Label, L"SurfaceSpreadOfFlame",
L"USERDEFINED.SPREAD_OF_FLAME"),
       Quantity(Quantity::Boolean, L"Compartmentation",
L"USERDEFINED.COMPARTMENT"),
       Quantity(Quantity::Boolean, L"ExtendToStructure",
L"USERDEFINED.EXTEND_TO_STRUCTURE"),
       Quantity(Quantity::Thermal, L"ThermalTransmittance",
L"USERDEFINED.THERMAL_TRANSMITTAN")}
    },
    /*! Hard coded IfcWallStandardCase properties */
    { ENTITY_IfcWallStandardCase, Pset_WallCommon     {
        Quantity(Quantity::Identifier, L"Reference",
L"USERDEFINED.REF_ID"),
        Quantity(Quantity::Enum, L"Status",
L"USERDEFINED.RENOVATION_STATUS"),
        Quantity(Quantity::Label, L"AcousticRating",
L"USERDEFINED.ACOUSTIC_RATING"),
        Quantity(Quantity::Label, L"FireRating",
L"USERDEFINED.FIRE_RATING"),
        Quantity(Quantity::Boolean, L"IsExternal",
L"USERDEFINED.IS_EXTERNAL"),
        Quantity(Quantity::Boolean, L"LoadBearing",
L"USERDEFINED.LOAD_BEARING"),
        Quantity(Quantity::Boolean, L"Combustible",
L"USERDEFINED.COMBUSTIBLE"),
        Quantity(Quantity::Label, L"SurfaceSpreadOfFlame",
L"USERDEFINED.SPREAD_OF_FLAME"),
        Quantity(Quantity::Boolean, L"Compartmentation",
L"USERDEFINED.COMPARTMENT"),
        Quantity(Quantity::Boolean, L"ExtendToStructure",
L"USERDEFINED.EXTEND_TO_STRUCTURE"),
        Quantity(Quantity::Thermal, L"ThermalTransmittance",
L"USERDEFINED.THERMAL_TRANSMITTAN")}
    },
     /*! Hard coded IfcPlate properties */
    { ENTITY_IfcPlate, Pset_PlateCommon {
       Quantity(Quantity::Label, L"AcousticRating",
L"USERDEFINED.ACOUSTIC_RATING"),
       Quantity(Quantity::Enum, L"Status",
L"USERDEFINED.RENOVATION_STATUS"),
       Quantity(Quantity::Boolean, L"IsExternal",
L"USERDEFINED.IS_EXTERNAL"),
       Quantity(Quantity::Boolean, L"LoadBearing",
L"USERDEFINED.LOAD_BEARING"),
       Quantity(Quantity::Identifier, L"Reference",
L"USERDEFINED.REF_ID"),
       Quantity(Quantity::Label, L"FireRating",
L"USERDEFINED.FIRE_RATING"),
       Quantity(Quantity::Thermal, L"ThermalTransmittance",
L"USERDEFINED.THERMAL_TRANSMITTAN") }
    },
    /*! Hard coded IfcCovering properties */
    { ENTITY_IfcCovering, Pset_CoveringCommon  {
        Quantity(Quantity::Label, L"AcousticRating",
L"USERDEFINED.ACOUSTIC_RATING"),
        Quantity(Quantity::Label, L"FlammabilityRating",
L"FLAMMABILITY_RATING"),
        Quantity(Quantity::Label, L"FragilityRating",
L"FRAGILITY_RATING"),
        Quantity(Quantity::Boolean, L"Combustible",
L"USERDEFINED.COMBUSTIBLE"),
        Quantity(Quantity::Label, L"SurfaceSpreadOfFlame",
L"USERDEFINED.SPREAD_OF_FLAME"),
```

```
            Quantity(Quantity::Label, L"Finish", L"FINISH") }
        },
        /*! Hard coded IfcOpeningElement properties */
        { ENTITY_IfcOpeningElement, Pset_OpeningElementCommon {
            Quantity(Quantity::Label, L"Purpose", L"PURPOSE"),
            Quantity(Quantity::Boolean, L"FireExit", L"FIRE_EXIT"),
            Quantity(Quantity::Boolean, L"ProtectedOpening",
L"PROTECTED_OPENING") }
        },
        /*! Hard coded IfcTendon properties */
        { ENTITY_IfcTendon, Pset_TendonCommon  {
            Quantity(Quantity::Identifier, L"Reference",
L"USERDEFINED.REF_ID"),
            Quantity(Quantity::PositiveLength, L"NominalDiameter",
L"DIAMETER_NOMINAL") }
        },
        /*! Hard coded IfcTendon anchor properties */
        { ENTITY_IfcTendonAnchor, Pset_TendonAnchorCommon   > {
            Quantity(Quantity::Identifier, L"Reference",
L"USERDEFINED.REF_ID"),
            Quantity(Quantity::Enum, L"Status",
L"USERDEFINED.RENOVATION_STATUS") }
        },
        /*! Hard coded IfcReinforcingBar properties */
        { ENTITY_IfcReinforcingBar, Pset_ReinforcingBarCommon    {
            Quantity(Quantity::Identifier, L"Reference", L"REBAR_POS"),
            Quantity(Quantity::Enum, L"Status",
L"USERDEFINED.RENOVATION_STATUS"),
            Quantity(Quantity::PositiveLength, L"NominalDiameter", L"SIZE"),
            Quantity(Quantity::PositiveLength, L"BarLength", L"LENGTH"),
            Quantity(Quantity::PositiveLength, L"BarSpacing", L"CC_EXACT"),
            Quantity(Quantity::Identifier, L"BendingShapeCode", L"SHAPE") }
        },
        /*! Hard coded IfcReinforcingMesh properties */
        { ENTITY_IfcReinforcingMesh, Pset_ReinforcingMeshCommon     {
            Quantity(Quantity::Identifier, L"Reference", L"MESH_POS"),
            Quantity(Quantity::Enum, L"Status",
L"USERDEFINED.RENOVATION_STATUS"),
            Quantity(Quantity::PositiveLength, L"MeshLength", L"LENGTH"),
            Quantity(Quantity::PositiveLength, L"MeshWidth", L"WIDTH"),
            Quantity(Quantity::PositiveLength,
L"LongitudinalBarNominalDiameter", L"CC_DIAMETER_MIN_LONG"),
            Quantity(Quantity::PositiveLength, L"LongitudinalBarSpacing",
L"CC_MIN_LONG"),
            Quantity(Quantity::PositiveLength,
L"TransverseBarNominalDiameter", L"CC_DIAMETER_MIN_CROSS"),
            Quantity(Quantity::PositiveLength, L"TransverseBarSpacing",
L"CC_MIN_CROSS"),
            Quantity(Quantity::Enum, L"LongitudinalBarSurface",
SET_CONSTANT_VALUE("TEXTURED").c_str()),
            Quantity(Quantity::Enum, L"TransverseBarSurface",
SET_CONSTANT_VALUE("TEXTURED").c_str()),
            Quantity(Quantity::Identifier,
L"LongitudinalBarBendingShapeCode", SET_CONSTANT_VALUE("A").c_str()),
            Quantity(Quantity::Identifier, L"TransverseBarBendingShapeCode",
SET_CONSTANT_VALUE("A").c_str()),
            Quantity(Quantity::Label, L"LongitudinalBarBendingParameters",
L"{LENGTH}"),
            Quantity(Quantity::Label, L"TransverseBarBendingParameters",
L"{WIDTH}") }
        }
};

/*! Hard coded quantities by entity type */
const std::unordered_map<IfcParser::IfcTypeAll_t, std::vector<Quantity>>
s_Quantities{
    /*! Hard coded IfcBeam quantities */
```

```
    { ENTITY_IfcBeam, Qto_BeamBaseQuantities {
        Quantity(Quantity::Length, L"Length", L"LENGTH"),
        Quantity(Quantity::Area, L"CrossSectionArea",
L"PROFILE.CROSS_SECTION_AREA", MM2_to_M2),
        Quantity(Quantity::Area, L"OuterSurfaceArea", L"AREA_GROSS",
MM2_to_M2),
        Quantity(Quantity::Area, L"GrossSurfaceArea", L"AREA_GROSS",
MM2_to_M2),
        Quantity(Quantity::Area, L"NetSurfaceArea", L"AREA_NET",
MM2_to_M2),
        Quantity(Quantity::Volume, L"GrossVolume", L"VOLUME_GROSS",
MM3_to_M3),
        Quantity(Quantity::Volume, L"NetVolume", L"VOLUME_NET",
MM3_to_M3),
        Quantity(Quantity::Weight, L"GrossWeight", L"WEIGHT_GROSS"),
        Quantity(Quantity::Weight, L"NetWeight", L"WEIGHT_NET")} },
    /*! Hard coded IfcMember quantities */
    { ENTITY_IfcMember, Qto_MemberBaseQuantities {
        Quantity(Quantity::Length, L"Length", L"LENGTH"),
        Quantity(Quantity::Area, L"CrossSectionArea",
L"PROFILE.CROSS_SECTION_AREA", MM2_to_M2),
        Quantity(Quantity::Area, L"OuterSurfaceArea", L"AREA_GROSS",
MM2_to_M2),
        Quantity(Quantity::Area, L"GrossSurfaceArea", L"AREA_GROSS",
MM2_to_M2),
        Quantity(Quantity::Area, L"NetSurfaceArea", L"AREA_NET",
MM2_to_M2),
        Quantity(Quantity::Volume, L"GrossVolume", L"VOLUME_GROSS",
MM3_to_M3),
        Quantity(Quantity::Volume, L"NetVolume", L"VOLUME_NET",
MM3_to_M3),
        Quantity(Quantity::Weight, L"GrossWeight", L"WEIGHT_GROSS"),
        Quantity(Quantity::Weight, L"NetWeight", L"WEIGHT_NET")} },
    /*! Hard coded IfcColumn quantities */
    { ENTITY_IfcColumn, Qto_ColumnBaseQuantities {
        Quantity(Quantity::Length, L"Length", L"LENGTH"),
        Quantity(Quantity::Area, L"CrossSectionArea",
L"PROFILE.CROSS_SECTION_AREA", MM2_to_M2),
        Quantity(Quantity::Area, L"OuterSurfaceArea", L"AREA_GROSS",
MM2_to_M2),
        Quantity(Quantity::Area, L"GrossSurfaceArea", L"AREA_GROSS",
MM2_to_M2),
        Quantity(Quantity::Area, L"NetSurfaceArea", L"AREA_NET",
MM2_to_M2),
        Quantity(Quantity::Volume, L"GrossVolume", L"VOLUME_GROSS",
MM3_to_M3),
        Quantity(Quantity::Volume, L"NetVolume", L"VOLUME_NET",
MM3_to_M3),
        Quantity(Quantity::Weight, L"GrossWeight", L"WEIGHT_GROSS"),
        Quantity(Quantity::Weight, L"NetWeight", L"WEIGHT_NET")} },
    /*! Hard coded IfcFooting quantities */
    { ENTITY_IfcFooting, Qto_FootingBaseQuantities {
        Quantity(Quantity::Length, L"Height", L"LENGTH"),
        Quantity(Quantity::Length, L"Length", L"HEIGHT"),
        Quantity(Quantity::Length, L"Width", L"WIDTH"),
        Quantity(Quantity::Area, L"CrossSectionArea",
L"PROFILE.CROSS_SECTION_AREA", MM2_to_M2),
        Quantity(Quantity::Area, L"OuterSurfaceArea", L"AREA_GROSS",
MM2_to_M2),
        Quantity(Quantity::Area, L"GrossSurfaceArea", L"AREA_GROSS",
MM2_to_M2),
        Quantity(Quantity::Volume, L"GrossVolume", L"VOLUME_GROSS",
MM3_to_M3),
        Quantity(Quantity::Volume, L"NetVolume", L"VOLUME_NET",
MM3_to_M3),
        Quantity(Quantity::Weight, L"GrossWeight", L"WEIGHT_GROSS"),
        Quantity(Quantity::Weight, L"NetWeight", L"WEIGHT_NET")} },
```

```
    /*! Hard coded IfcPile quantities */
    { ENTITY_IfcPile, Qto_PileBaseQuantities {
        Quantity(Quantity::Length, L"Length", L"LENGTH"),
        Quantity(Quantity::Area, L"CrossSectionArea",
L"PROFILE.CROSS_SECTION_AREA", MM2_to_M2),
        Quantity(Quantity::Area, L"OuterSurfaceArea", L"AREA_GROSS",
MM2_to_M2),
        Quantity(Quantity::Area, L"GrossSurfaceArea", L"AREA_GROSS",
MM2_to_M2),
        Quantity(Quantity::Volume, L"GrossVolume", L"VOLUME_GROSS",
MM3_to_M3),
        Quantity(Quantity::Volume, L"NetVolume", L"VOLUME_NET",
MM3_to_M3),
        Quantity(Quantity::Weight, L"GrossWeight", L"WEIGHT_GROSS"),
        Quantity(Quantity::Weight, L"NetWeight", L"WEIGHT_NET")} },
    /*! Hard coded IfcSlab quantities */
    { ENTITY_IfcSlab, Qto_SlabBaseQuantities {
        Quantity(Quantity::Length, L"Depth", L"WIDTH"),
        Quantity(Quantity::Length, L"Length", L"LENGTH"),
        Quantity(Quantity::Length, L"Width", L"HEIGHT"),
        Quantity(Quantity::Area, L"GrossArea", L"AREA_GROSS", MM2_to_M2),
        Quantity(Quantity::Area, L"NetArea", L"AREA_NET", MM2_to_M2),
        Quantity(Quantity::Area, L"SideArea", L"AREA_FORM_SIDE",
MM2_to_M2),
        Quantity(Quantity::Volume, L"GrossVolume", L"VOLUME_GROSS",
MM3_to_M3),
        Quantity(Quantity::Volume, L"NetVolume", L"VOLUME_NET",
MM3_to_M3),
        Quantity(Quantity::Weight, L"GrossWeight", L"WEIGHT_GROSS"),
        Quantity(Quantity::Weight, L"NetWeight", L"WEIGHT_NET"),
        Quantity(Quantity::Length, L"Perimeter", L"PERIMETER")} },
    /*! Hard coded IfcWall quantities */
    { ENTITY_IfcWall, Qto_WallBaseQuantities{
        Quantity(Quantity::Length, L"Width", L"WIDTH"),
        Quantity(Quantity::Length, L"Length", L"LENGTH"),
        Quantity(Quantity::Length, L"Height", L"HEIGHT"),
        Quantity(Quantity::Area, L"NetSideArea", L"AREA_FORM_SIDE",
MM2_to_M2),
        //Quantity(Quantity::Area, L"GrossSideArea",
L"AREA_FORM_SIDE_GLOBAL", MM2_to_M2), // AREA_FORM_SIDE_GLOBAL not
implemented yet.
        Quantity(Quantity::Area, L"NetFootprintArea",
L"AREA_PROJECTION_GXY_NET", MM2_to_M2),
        Quantity(Quantity::Volume, L"GrossVolume", L"VOLUME_GROSS",
MM3_to_M3),
        Quantity(Quantity::Volume, L"NetVolume", L"VOLUME_NET",
MM3_to_M3),
        Quantity(Quantity::Weight, L"GrossWeight", L"WEIGHT_GROSS"),
        Quantity(Quantity::Weight, L"NetWeight", L"WEIGHT_NET")} },
    /*! Hard coded IfcWallStandardCase quantities */
    { ENTITY_IfcWallStandardCase, Qto_WallBaseQuantities{
        Quantity(Quantity::Length, L"Width", L"WIDTH"),
        Quantity(Quantity::Length, L"Length", L"LENGTH"),
        Quantity(Quantity::Length, L"Height", L"HEIGHT"),
        Quantity(Quantity::Area, L"NetSideArea", L"AREA_FORM_SIDE",
MM2_to_M2),
        // Quantity(Quantity::Area, L"GrossSideArea",
L"AREA_FORM_SIDE_GLOBAL", MM2_to_M2), // AREA_FORM_SIDE_GLOBAL not
implemented yet.
        Quantity(Quantity::Area, L"NetFootprintArea",
L"AREA_PROJECTION_GXY_NET", MM2_to_M2),
        Quantity(Quantity::Volume, L"GrossVolume", L"VOLUME_GROSS",
MM3_to_M3),
        Quantity(Quantity::Volume, L"NetVolume", L"VOLUME_NET",
MM3_to_M3),
        Quantity(Quantity::Weight, L"GrossWeight", L"WEIGHT_GROSS"),
        Quantity(Quantity::Weight, L"NetWeight", L"WEIGHT_NET")} },
```

```
     /*! Hard coded IfcPlate quantities */
    { ENTITY_IfcPlate, Qto_PlateBaseQuantities {
        Quantity(Quantity::Length, L"Width", L"WIDTH"),
        Quantity(Quantity::Area, L"GrossArea", L"AREA_GROSS", MM2_to_M2),
        Quantity(Quantity::Area, L"NetArea", L"AREA_NET", MM2_to_M2),
        Quantity(Quantity::Area, L"SideArea", L"AREA_FORM_SIDE",
MM2_to_M2),
        Quantity(Quantity::Volume, L"GrossVolume", L"VOLUME_GROSS",
MM3_to_M3),
        Quantity(Quantity::Volume, L"NetVolume", L"VOLUME_NET",
MM3_to_M3),
        Quantity(Quantity::Weight, L"GrossWeight", L"WEIGHT_GROSS"),
        Quantity(Quantity::Weight, L"NetWeight", L"WEIGHT_NET"),
        Quantity(Quantity::Length, L"Perimeter", L"PERIMETER")} },
    /*! Hard coded IfcBuildingElementProxy quantities */
    { ENTITY_IfcBuildingElementProxy, Qto_BuildingElementProxyQuantities {
        Quantity(Quantity::Area, L"NetSurfaceArea", L"AREA_NET",
MM2_to_M2),
        Quantity(Quantity::Volume, L"NetVolume", L"VOLUME_NET",
MM3_to_M3)} },
    /*! Hard coded IfcCovering quantities */
    { ENTITY_IfcCovering, Qto_CoveringBaseQuantities {
        Quantity(Quantity::Length, L"Width", L"WIDTH"),
        Quantity(Quantity::Area, L"GrossArea", L"AREA_GROSS", MM2_to_M2),
        Quantity(Quantity::Area, L"NetArea", L"AREA_NET", MM2_to_M2)} },
    /*! Hard coded IfcReinforcingBar quantities */
    { ENTITY_IfcReinforcingBar, Qto_ReinforcingElementBaseQuantities {
        Quantity(Quantity::Length, L"Length", L"LENGTH"),
        Quantity(Quantity::Weight, L"Weight", L"WEIGHT") } },
    /*! Hard coded IfcOpeningElement quantities */
    { ENTITY_IfcOpeningElement, Qto_OpeningBaseQuantities {
        Quantity(Quantity::Length, L"Width", L"WIDTH"),
        Quantity(Quantity::Length, L"Height", L"HEIGHT"),
        Quantity(Quantity::Area, L"Area", L"AREA", MM2_to_M2),
        Quantity(Quantity::Volume, L"Volume", L"VOLUME", MM3_to_M3)} },
    /*! Hard coded IfcRoof quantities */
    { ENTITY_IfcRoof, Qto_RoofBaseQuantities {
        Quantity(Quantity::Area, L"GrossArea", L"AREA_GROSS", MM2_to_M2),
        Quantity(Quantity::Area, L"NetArea", L"AREA_NET", MM2_to_M2),
        Quantity(Quantity::Area, L"ProjectedArea",
L"AREA_PROJECTION_GXY_NET", MM2_to_M2)} },
    /*! Hard coded IfcRailing quantities */
    { ENTITY_IfcRailing, Qto_RailingBaseQuantities{
        Quantity(Quantity::Length, L"Length", L"LENGTH")} },
    /*! Hard coded IfcRampFlight quantities */
    { ENTITY_IfcRampFlight, Qto_RampFlightBaseQuantities{
        Quantity(Quantity::Length, L"Length", L"LENGTH"),
        Quantity(Quantity::Length, L"Width", L"WIDTH"),
        Quantity(Quantity::Area, L"GrossArea", L"AREA_GROSS", MM2_to_M2),
        Quantity(Quantity::Area, L"NetArea", L"AREA_NET", MM2_to_M2),
        Quantity(Quantity::Volume, L"GrossVolume", L"VOLUME_GROSS",
MM3_to_M3),
        Quantity(Quantity::Volume, L"NetVolume", L"VOLUME_NET",
MM3_to_M3)} },
    /*! Hard coded IfcStairFlight quantities */
    { ENTITY_IfcStairFlight, Qto_StairFlightBaseQuantities{
        Quantity(Quantity::Length, L"Length", L"LENGTH"),
        Quantity(Quantity::Volume, L"GrossVolume", L"VOLUME_GROSS",
MM3_to_M3),
        Quantity(Quantity::Volume, L"NetVolume", L"VOLUME_NET",
MM3_to_M3)} }
};
```

DSTV file description

Tekla Structures produces NC files in DSTV format. DSTV format is an industrial standard defined by the German Steel Construction Association (Deutsche Stahlbau-Verband). A DSTV file is a text file in ASCII format. In most cases each part has its own DSTV file.

To learn more about the DTSV syntax, see Standard Description for Steel Structure Pieces for the Numerical Controls.

Blocks

The DSTV file is divided into blocks that describe the content of the file.

DSTV block	Description
ST	Start of the file
EN	End of the file
BO	Hole
SI	Hardstamp
AK	External contour
IK	Internal contour
PU	Powder
KO	Mark
KA	Bending

Profile types

Profile types are named according to the DSTV standard.

DSTV profile type	Description
I	I profiles
U	U and C profiles
L	L profiles
M	Rectangular tubes
RO	Round bars
RU	Round tubes
B	Plate profiles
CC	CC profiles
T	T profiles
SO	Z profiles and all the other types of profile

Part faces

Single letters in the DSTV file describe the part faces.

Letter	Part face
v	front
o	top
u	bottom
h	behind

tekla_dstv2dxf_<env>.def file description

The tekla_dstv2dxf_<env>.def file is used when converting from the DSTV to the DXF format using the tekla_dstv2dxf.exe. It contains all the necessary conversion settings. The .def file is located in the ..\Tekla Structures\<version>\bin\applications\Tekla\Tools\dstv2dxf folder.

The DSTV to DXF conversiong settings are described below.

Environment settings [ENVIRONMENT]

INCLUDE_SHOP_DATA_SECTION=FALSE

Specify whether to include a special data section in the DXF file to allow the DXF file to be better imported into CNC software written by Shop Data Systems. Including this special data section in the DXF file makes the DXF file unreadable by AutoCAD.

Options: TRUE, FALSE

NO_INFILE_EXT_IN_OUTFILE=TRUE

Use to add the input file extension to the output file.

Options:

TRUE: p1001.dxf

FALSE: p1001.nc1.dxf

DRAW_CROSSHAIRS=HOLES

Draw crosshair for holes and slotted holes.

Options: HOLES, LONG_HOLES, BOTH, NONE

HOLES:

LONG_HOLES:

BOTH:

NONE:

SIDE_TO_CONVERT=FRONT

Define which side of the member to convert.

Options: FRONT, TOP, BACK, BELOW

Defines which part face is shown in the DXF file. This setting is originally designed for plates.

FRONT is the most typical option. Sometimes you may need another rotation for a plate, and then you can try if changing this setting to BACK would help. In addition to the SIDE_TO_CONVERT setting, it requires that the NC files are created with the advanced option XS_DSTV_WRITE_BEHIND_FACE_FOR_PLATE set to TRUE, which will include the back side data of a plate in the NC file.

OUTPUT_CONTOURS_AS=POLYLINES

Convert contours as polylines or lines and arcs.

Options: POLYLINES, LINES_ARCS

NOTE If you set OUTPUT_CONTOURS_AS=LINES_ARCS:

- Slotted holes may sometimes have a gap/offset between a straight line and an arc.
- Sometimes a 3D DXF is produced instead of a 2D DXF.

If you set OUTPUT_CONTOURS_AS=POLYLINES, the DXF file may not be correct if the NC is created with the **Inner corner=0** setting.

CONTOUR_DIRECTION=REVERSE

Define the contour direction. This option changes the coordinates of the vertices, and the order they are written. You can see the difference if you open the DXF file in a text editor: "reverse" is clockwise and "forward" is counter-clockwise.

Options: `REVERSE`, `FORWARD`

`CONTOUR_DIRECTION` only works if you have set `OUTPUT_CONTOURS_AS=POLYLINES`. If you have set it to use `LINES_ARCS`, the output is always `FORWARD` (counter-clockwise).

CONVERT_HOLES_TO_POLYLINES=TRUE

Convert holes to polylines.

Options: `TRUE`, `FALSE`

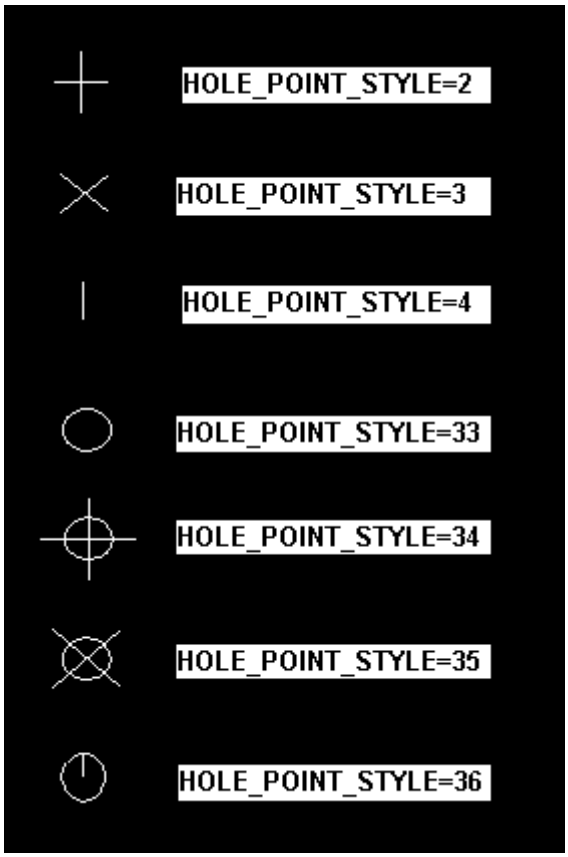
MAX_HOLE_DIAMETER_TO_POINTS=10.0

Convert small holes to points in the DXF file.

When you set `MAX_HOLE_DIAMETER_TO_POINTS` to a value, the holes with a diameter smaller than this value will follow the `HOLE_POINT_SIZE` and `HOLE_POINT_STYLE` settings. With this kind of point visualization, the hole symbols will no longer show if a hole is bigger or smaller than the other one, but they will all have the same size.

HOLE_POINT_STYLE=33 and HOLE_POINT_SIZE=5

Point style and size for holes.



1 is a circle, but this setting is not in use

2 is +

3 is X

4 is short line

33 is circle

34 is a circle with +

35 is a circle with X

36 is a circle with short line

SCALE_DSTV_BY=0.03937

Use 0.03937 to scale to imperial units.

Use 1.0 to scale to metric units.

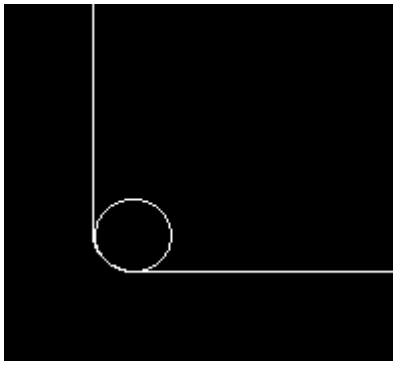
ADD_OUTER_CONTOUR_ROUNDINGS=FALSE

Add holes to roundings. This only affects the roundings that are created using the **Inner corners shape**: **1** setting in the **NC file settings** dialog box on the **Holes and cuts** tab. The hole size information is coming to the DSTV file from the **Radius** value in the **NC file settings** dialog box, and you cannot adjust the hole size in the `dstv2dxf` converter.

Options: `TRUE`, `FALSE`

ADD_OUTER_CONTOUR_ROUNDINGS=FALSE:

ADD_OUTER_CONTOUR_ROUNDINGS=TRUE:



MIN_MATL_BETWEEN_HOLES=2.0

Define how close the holes can be to each other in slotted hole conversion.

INPUT_FILE_DIR= and OUTPUT_FILE_DIR=

Folders for input and output files.

DEBUG=FALSE

Show data processing in the DOS window.

Options: TRUE or FALSE

Text specifications [TEXT_SPECS]

TEXT_OPTIONS=PQDG

Define the text options that you want to use in the DXF file:

S adds a side mark (Side: v)

P adds a part mark (Part: P/1)

B adds a part mark and side mark (Part: P/1 Side: v)

Q adds the quantity (Quantity: 5)

G adds the steel grade (Material: A36)

T adds the thickness (Thickness: 3)

D adds the profile description (Desc: FL5/8X7)

TEXT_POSITION_X=30.0 and TEXT_POSITION_Y=30.0

The X/Y location of lower-left corner of first line of text from the origin point <0,0> of the DXF file.

TEXT_HEIGHT=0.0

TEXT_HEIGHT is not used, the text height is always 10.0, also in text layers.

Text item prefixes

You can define several different prefixes for text items. The prefix is only written in the file if the option `CONCATENATE_TEXT` is set to `0`.

You can use the following prefix definitions:

```
PART_MARK_PREFIX=Part:
SIDE_MARK_PREFIX=Side:
STEEL_QUALITY_PREFIX=Material:
QUANTITY_PREFIX=Quantity:
THICKNESS_PREFIX=Thickness:
DESCRIPTION_PREFIX=Desc:
```

CONCATENATE_TEXT=1

Combine text items (part mark, quantity, profile, grade) into one or two lines.

Options:

0: Text lines are not combined. Prefixes work only with this option.

1: Part mark text on one line, other texts combined on another line.

2: All text on one line.

CONCATENATE_CHAR=+

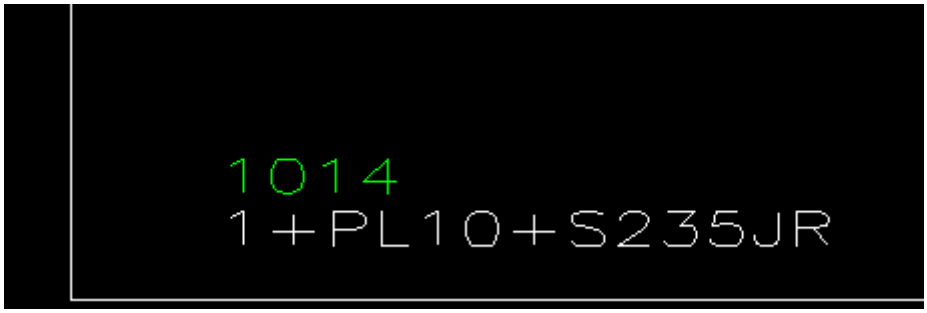
Define a separator of max 19 characters for the text items.

Examples of different text specifications

The following settings are used the example below:

```
TEXT_OPTIONS=PQDG
TEXT_POSITION_X=30.0
TEXT_POSITION_Y=30.0
TEXT_HEIGHT=0.0
PART_MARK_PREFIX=Part:
SIDE_MARK_PREFIX=Side:
STEEL_QUALITY_PREFIX=Material:
QUANTITY_PREFIX=Quantity:
```

```
THICKNESS_PREFIX=Thickness:
DESCRIPTION_PREFIX=Desc:
CONCATENATE_TEXT=1
CONCATENATE_CHAR=+
```



The following settings are used for the example below: `TEXT_OPTIONS=B`, `CONCATENATE_TEXT=0`:

Miscellaneous layers [MISC_LAYERS]

Entity	Layer Name	Color	Text Height	Output as
TEXT	TEXT	7	Not used, always the same as the general text height definition 10.0.	
OUTER_CONTOUR	CUT	7		
INNER_CONTOUR	CUTOUT	4		
PART_MARK	SCRIBE	3	Do not set a value for this option. If you set one, the DXF file will not be created.	

Entity	Layer Name	Color	Text Height	Output as
PHANTOM	LAYOUT	4		
NS_POP_PMARK	NS_POP_MARK	5		POP_CIRCLE 2.0 (POP_CIRCLE or POP_POINT followed by size)
FS_POP_PMARK	FS_POP_MARK	6	1.0 This '1.0' is the diameter of the hole used for far side pop marks. It must match the value in the "drill thru" option in the machinex.ini file	POP_CIRCLE 2.0 (POP_CIRCLE or POP_POINT followed by size)

Color table

1 = red

2 = yellow

3 = green

4 = cyan

5 = blue

6 = magenta

7 = white

8 = dark grey

9 = light grey

Hole layers [HOLE_LAYERS]

Layer Name	Min Diam	Max Diam	Color
P1	8.0	10.31	7
P2	10.32	11.90	7
P3	11.91	14.0	7

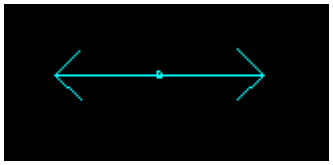
Slot layers [SLOT_LAYERS]

The type and color affect the symbol, but the color of the slot outline or arrow (phantom) is defined by the `PHANTOM` layer definition in the `MISC_LAYERS` definition.

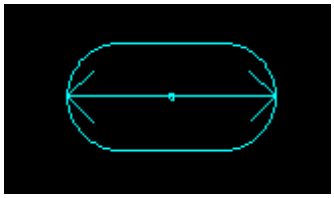
Layer Name	Min Diam	Max Diam	Min 'b'	Max 'b'	Min 'h'	Max 'h'	Type	Color	Phantom
13_16x1	20.62	20.65	4.75	4.78	0.0	0.02	3	3	PHANTOM_OUTLINE
13_16x1-7_8	20.62	20.65	26.97	26.99	0.0	0.02	3	3	PHANTOM_OUTLINE

Below there are three examples with different phantom types. The other settings used are `Slot type=1`, `HOLE_POINT_STYLE=33` and `HOLE_POINT_SIZE=1`

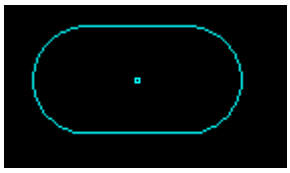
`PHANTOM_ARROW`:



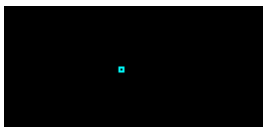
`PHANTOM_BOTH`:



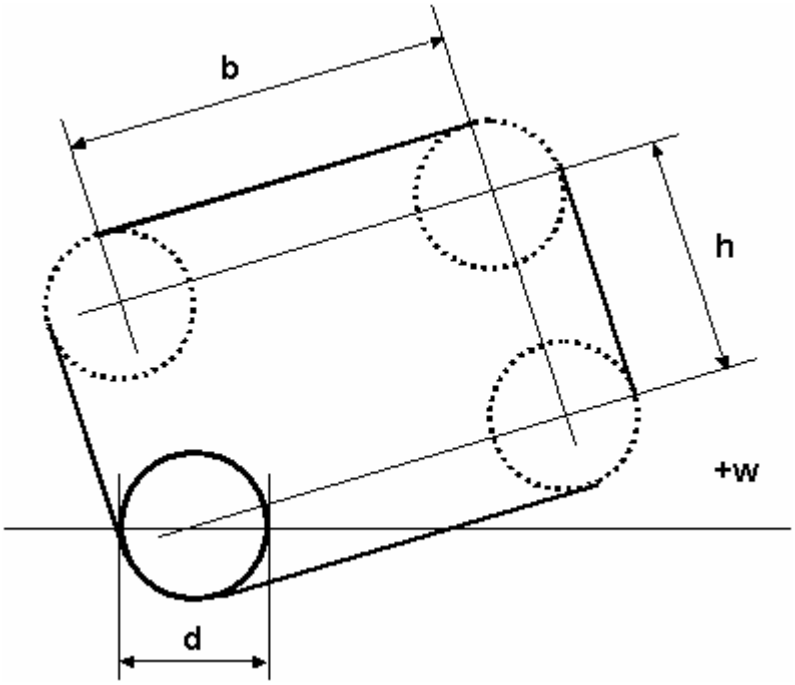
`PHANTOM_OUTLINE`:



`PHANTOM_NONE`:



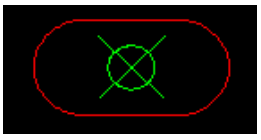
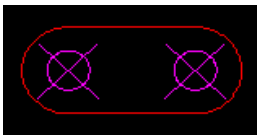
For an explanation of the "b" and "h" dimensions, see the image below:

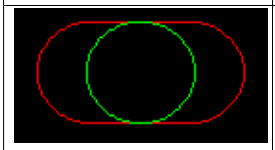
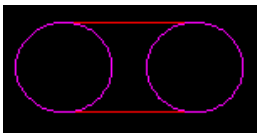
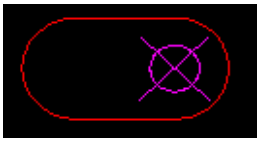
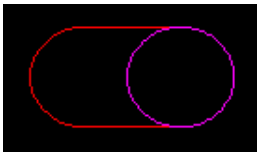


Examples of slot types

These example use different slot types, but the other setting are the same:

- Slot layer color is 3 (green).
- Hole layer color is 6 (magenta).
- Phantom layer color is 1 (red).
- Slot layer phantom type: `PHANTOM_OUTLINE`
- Hole point settings: `HOLE_POINT_STYLE=35`, `HOLE_POINT_SIZE=10`

Slot type	Description
`SLOT_TYPE_1` 	One hole symbol to the center of slot. The hole symbol follows the `HOLE_POINT_STYLE` and `HOLE_POINT_SIZE` settings. The slot symbol is created according to the selected phantom setting (`PHANTOM_OUTLINE` in this example). The circle color follows the slot layer color, and the slot color follows the phantom layer color.
`SLOT_TYPE_2` 	Two hole symbols to the slot. The hole symbol follows the `HOLE_POINT_STYLE` and `HOLE_POINT_SIZE` settings. The slot symbol is created according to the selected phantom setting (`PHANTOM_OUTLINE` in this example). The hole symbol color follows the hole layer color, and the slot color follows the phantom layer color.
`SLOT_TYPE_3`	One circle to the center of slot. The size of the circle corresponds to the real hole size. The circle color follows the slot layer color, and the slot color follows the phantom layer color. The slot symbol is created according

Slot type	Description
	to the selected phantom setting (PHANTOM_OUTLINE in this example).
SLOT_TYPE_4 	Two circles to the slot. The size of the circle corresponds to the real hole size. If the circles would be touching each other, only one circle in the middle of slot is created. The slot symbol is created according to the selected phantom setting (PHANTOM_OUTLINE in this example). The circle color follows the hole layer color, and the slot color follows the phantom layer color.
SLOT_TYPE_5 	Hole symbol to the first slot center point. The hole symbol follows the HOLE_POINT_STYLE and HOLE_POINT_SIZE settings. The slot symbol is created according to the selected phantom setting (PHANTOM_OUTLINE in this example). The hole symbol color follows the hole layer color, and the slot symbol color follows the phantom layer.
SLOT_TYPE_6 	One circle to the first slot center point. The slot symbol is created according to the selected phantom setting (PHANTOM_OUTLINE in this example). The circle color follows the hole layer color, and the slot symbol color follows the phantom layer color.
SLOT_TYPE_7 	No hole symbol is created. The slot symbol is created according to the selected phantom setting (PHANTOM_OUTLINE in this example). The slot color follows the slot layer color.

ASCII file description

In an `import.asc` file each part is described by 8 lines. These lines are repeated for each part to be transferred. Units are always in millimeters, blanks are used as separators.

Below is an example of a beam part description:

```
import.asc

4169 HEA300 1
290.000000 8.500000 300.000000 14.000000 300.000000 14.000000
A/6 BEAM
S235JR S235JR
0.000000
16.500000        24000.000000     4855.000000
6000.000000      24000.000000     4855.000000
16.500000        24000.000000     5855.000000
```

Line	Description
Line 1	`4169 HEA300 1` = ID profile type • ID 4169: Unique ID (integer). • PROFILE HEA300: Profile name (string). • TYPE 1: Profile type (integer) The available profile types are: `0` = free cross section (can be used for special profiles which are not in the database) `1` = I profiles `2` = Welded hollow core profiles (HK, HQ) `3` = U profiles `4` = L profiles `5` = Round bars `6` = Round tubes `7` = Rectangular hollow core sections (RHS, P) `8` = T profiles `9` = Rectangular bars (FL, PL) `10` = Z profiles `11` = C profiles `12` = Omega profiles `13` = Sigma profiles `14` = Rail profile `16` = Reinforcement bars (DH)
Line 2	The contents of line 2 depend on the part profile. • Polygon plates: N_POINTS COORDINATES

Line	Description
	N_POINTS: For profiles of type 0. COORDINATES: Number of the corner points (integer). The X and Y coordinates of the plate corners (floating). Rotation direction is clockwise. Coordinates follow the global coordinate system. Z coordinates are taken from the center line in the plate thickness direction. Note that the line 2 can be divided into several rows in the file. • Profiles: For profile types `1-16`, the line includes the physical dimensions of the cross section. HEIGHT S W1 T1 W2 T2: `290.000000 8.500000 300.000000 14.000000 300.000000 14.000000` • HEIGHT `290.000000`: Height of the cross section • S `8.500000`: Web thickness. • W1 `300.000000`: Width of the upper flange. • T1 `14.000000`: Thickness of the upper flange. • W2 `300.000000`: Width of the lower flange. • T2 `14.000000`: Thickness of the lower flange.
Line 3	`A/6 BEAM` = mark name • MARK A/6: Position mark of the part (string). • NAME BEAM: Part name (string).
Line 4	`S235JR S235JR` = material Material of the part (string).
Line 5	`0.000000` = rotation Rotation angle (in degrees) around the local x-axis of the beam.
Line 6	`16.500000 24000.000000 4855.000000` = X1 Y1 Z1 Coordinates of the beam start point. Z coordinates are center-line coordinates.
Line 7	`6000.000000 24000.000000 4855.000000` = X2 Y2 Z2 Coordinates of the beam end point. Z-coordinates are center-line coordinates.
Line 8	`16.500000 24000.000000 5855.000000` = X3 Y3 Z3 Direction vector showing the direction of the local z-axis.

4.8 Customize catalogs and databases

You can customize catalogs and databases to contain the only relevant content for your project. Customizing catalogs and databases helps you to simplify your work and avoid mistakes.

You can customize catalogs and databases for:

- materials
- profiles
- shapes (page 294)
- bolts (page 314)
- rebars (page 328)
- applications and components (page 339)

Always ensure that the catalog content is correct. Mistakes in catalogs might lead to serious inconsistencies in quantity information, data transfer, or other calculations. For example, incorrect material density leads to systematic errors in reported weights.

You can add new content to catalogs from other environments, from Tekla Warehouse, or import content created in other software solutions.

Additional content in Tekla Warehouse

In Tekla Warehouse, you can find additional content, such as application tools and environment content.

You can download Tekla Warehouse offline content that includes the catalog content of environments, such as profiles, bolts, materials, and reinforcements. The content is in `.tsep` packages that are installed when you open Tekla Structures.

The offline catalog content is under **Tekla Structures collections** in Tekla Warehouse. To find this content, search for **Catalogs**, then under **Show** select **Collections**.

You can also create a local collection for your company, and share it with your organization in your internal network. You can manage the access rights on the folder and collection level in the `collections.json` file on each user's computer. Copy the file to the same location on each user's computer. The file is located in `C:\Users\Public\Public Documents\Trimble\Tekla Warehouse\collections.json`.

This image shows an example of the collection paths with four Tekla Structures collections:

```
{
  "collections":
  [
    "\\\\Server1\\Tekla Warehouse\\OfflineContent\\austria",
    "\\\\Server1\\Tekla Warehouse\\OfflineContent\\brazil",
    "\\\\Server1\\Tekla Warehouse\\OfflineContent\\china",
    "\\\\Server1\\Tekla Warehouse\\OfflineContent\\czech",
  ]
}
```

In Tekla Warehouse the collections are found after mapping under **My collections** --> **Local and network collections** .

Customize the material catalog

The material catalog contains information about material types and grades. Materials are shown in a hierarchical tree grouped according to their types, with material grades listed under each material type.

The following material types are available in Tekla Structures:

- Steel
- Concrete
- Reinforcing bar
- Timber
- Miscellaneous

By default, the material catalog contains standard, environment-specific materials. You can add, modify, and delete material grades.

Tekla Structures stores the material information in the `matdb.bin` file.

Important buttons in the material catalog

When you work with the material grades, note the usage of the following buttons in the **Modify Material Catalog** dialog box:

Button	Description
Update	Saves the changes of a single edited material grade to the computer's memory until you click **OK**.
OK	Saves the changes in the model folder. Tekla Structures saves the modified catalog on the hard disk when you click **OK** to close the dialog box and then click **OK** in the **Save confirmation** dialog box.
Cancel	Closes the **Modify Material Catalog** dialog box without saving the changes. Note that all changes made to the catalog will be lost even if you have clicked **Update**, because the changes have not been saved on the hard disk. The changes made to the catalog are visible during one session, because the catalog is using the computer's memory. When you start Tekla Structures the next time, the previous data is restored from the hard disk.

Tekla Structures stores the material information in the `matdb.bin` file. When you first open a model, Tekla Structures reads the data from the hard disk and stores it in the computer's memory.

When you select a material, Tekla Structures reads the data from the computer's memory and displays it in the **Modify Material Catalog** dialog box. This is faster than accessing the data from the hard disk.

Add a material grade

1. On the **File** menu, click **Catalogs** --> **Material catalog** to open the **Modify Material Catalog** dialog box.
2. Select a material type, for example, steel.
3. Right-click and select **Add Grade**.

   A new material grade is added under to the material type you selected.
4. Change the material grade name by clicking the grade and entering a new name for it.
5. Enter the material grade properties.
6. Click **OK** to save the material grade and close the **Modify Material Catalog** dialog box.
7. Click **OK** in the **Save confirmation** dialog box to save the changes.

Copy a material grade

You can add new material grades by modifying a copy of an existing, similar material grade.

1. On the **File** menu, click **Catalogs** --> **Material catalog** to open the **Modify Material Catalog** dialog box.
2. Select a material grade that is similar to the one that you want to create.
3. Right-click and select **Copy Grade**.

   A copy of the material grade with the name **COPY** is added to the material tree.
4. Change the material grade name by clicking the grade and entering a new name for it.
5. Modify the material grade properties.
6. Click **OK** to save the material grade and close the **Modify Material Catalog** dialog box.
7. Click **OK** in the **Save confirmation** dialog box to save the changes.

Modify a material grade

You can modify existing material grades using the material catalog.

1. On the **File** menu, click **Catalogs** --> **Material catalog** to open the **Modify Material Catalog** dialog box.
2. Select a material grade in the tree and modify its properties.
   - Use the **General** tab for entering three alternative names for the material. The names are usually the material names used in different countries or standards. The tab also contains the profile and plate density values.
   - Use the **Analysis** tab for entering information on the properties used in structural analysis.
   - Use the **Design** tab for entering information on the design-specific properties, such as strengths and partial safety factors.
   - Use the **User attributes** tab for creating your own attributes for material grades.

     For example, you can define a paint layer thickness, or the maximum grain size of concrete using a user-defined attribute.
3. When you have finished modifying the material grade, click **Update**.
4. Click **OK** to close the **Modify Material Catalog** dialog box.

   Tekla Structures asks if you want to save the changes to the model folder.
5. Click **OK** in the **Save confirmation** dialog box to save the changes.

   The modified material catalog is saved in the current model folder and is available only for that model. To make the modified catalog available for all the other models, use export and import.

Delete a material grade

1. On the **File** menu, click **Catalogs** --> **Material catalog** to open the **Modify Material Catalog** dialog box.
2. Select the material grade that you want to delete.
3. Right-click and select **Delete Grade**.
4. Click **OK** to close the **Modify Material Catalog** dialog box.
5. Click **OK** in the **Save confirmation** dialog box to save the changes.

Add user attributes to material grades

You can add user attributes and their values to the material grades. The user attributes can then be used, for example, in filtering.

1. On the **File** menu, click **Catalogs** --> **Material catalog** to open the **Modify Material Catalog** dialog box.
2. On the **User attributes** tab, click **Definitions** to open the **Modify Material Properties** dialog box.
3. Click **Add** to add a new row.
4. To define a user attribute, click each item on a row.
   a. In the **Category** list, select a material category to which the user attribute is applied.
   b. In the **Design code** list, select a design code to which the attribute is added.
   c. In the **Material type** list, select a material type for the attribute.
   d. In the **Quantity type** list, select the type of information that the user attribute contains, for example, weight, area, ratio, or string.
   e. In the **Order** column, define the order in which the user attributes are shown in the dialog box. Smaller values are shown first.
   f. In the **Property name** column, define a name for the property.

      The name is saved in the catalog and can be used in reports and templates. When **Property name** is used in a template, `MATERIAL.PROPERTY_NAME` indicates where the property name appears.
   g. In the **Label** column, define a label for the attribute.
5. Click **Update**.
6. Click **OK** to close the **Modify Material Properties** dialog box.

Create user-defined material definitions

You can replace the existing material definitions with your own definitions and use them, for example, in drawing part marks. Material definitions can contain text, numbers and symbols.

1. Save the symbol file `user_material_symbols.sym` in the symbol folder (usually the folder `..\ProgramData\Trimble\Tekla Structures\<version>\environments\common\symbols\`).
2. In a text editor, such as Microsoft Notepad, create a text file that contains your material definitions.

   Each row in the file defines a material. Use the following syntax: `material_name symbol_file_name@n`, where

   - `material_name` is the name of the material used in the material catalog
   - `symbol_file_name` is the symbol file name to be used
   - `n` is the number of the symbol.

   For example:

```
S235JRG1    user_material_symbols@1    B
S235JRG2    user_material_symbols@2    C
S235JR      user_material_symbols@0    A
S275JR      user_material_symbols@3    D
S235JR      user_material_symbols@4    E
```

   WARNING The order of material names in the definition file affects the conversion. Materials with more specific names must be listed before the ones with similar, but simpler names, such as S235JRG1, must be listed before S235JR. Otherwise they both get the same symbol.

3. Save the file for example with the name `user_material_definitions.txt`.

   All the named materials in the material catalog will be replaced with the ones defined in this file.

4. Set the name of the file as a value for the advanced option `XS_MATERIAL_SYMBOL_REPRESENTATION_FILE` in **File menu** --> **Settings** --> **Advanced options** --> **Drawing Properties** as follows:

```
set XS_MATERIAL_SYMBOL_REPRESENTATION_FILE=user_material_definitions.txt
```

   You can also enter a full path to the material definition file. Without the path, Tekla Structures searches for the file in the model, firm, project, and system folders.

About importing and exporting material grades

Use importing and exporting for merging material catalogs. Material catalogs are imported and exported as `.lis` files.

Importing and exporting is useful when you:

- upgrade to a newer version of Tekla Structures and want to use a customized material catalog from a previous version
- want to combine material catalogs that are stored in different locations
- want to share material catalog information with other users
- want to combine material catalogs across different environments.

TIP You can also download or share material grades using .

Export a part of the material catalog

If you do not want to export the whole material catalog, you can export a branch of the material tree, meaning all the material grades grouped under one material type, or a single material grade. Material catalogs are exported from Tekla Structures models as `.lis` files.

1. On the **File** menu, click **Catalogs** --> **Material catalog** to open the **Modify Material Catalog** dialog box.
2. Select material grades to be exported.
   - To export a branch of the material tree, right-click the branch and select **Export Grades**.
   - To export a single material grade, right-click the material grade and select **Export Grade**.
3. Browse for the folder where you want to save the export files.

   By default, the file is saved to the current model folder.
4. Enter a name for the file and click **OK**.
5. Click **OK** to close the **Modify Material Catalog** dialog box.
6. Click **OK** in the **Save confirmation** dialog box to save the changes.

Export an entire material catalog

Exporting and importing are used to merge material catalogs. Material catalogs are exported from Tekla Structures models as `.lis` files. Note that the **Export** command exports the entire catalog.

1. On the **File** menu, click **Catalogs** --> **Material catalog** to open the **Modify Material Catalog** dialog box.
2. Click **Export**.

3. Browse for the folder where you want to save the exported file.

   By default, the file is saved to the current model folder.
4. Enter a name for the file and click **OK**.
5. Click **OK** to close the **Modify Material Catalog** dialog box.
6. Click **OK** in the **Save confirmation** dialog box to save the changes.

Import a material catalog

Material catalogs are imported to Tekla Structures models as `.lis` files. You can move an exported `.lis` file to any model folder and import it to an existing material catalog.

1. Open the model to which you want to import a material catalog.
2. On the **File** menu, click **Catalogs** --> **Material catalog** to open the **Modify Material Catalog** dialog box.
3. Click **Import**.
4. Browse for the folder that contains the import file, and select the file.
5. Click **OK**.

   If a material with a same name as the material being imported already exists, the **Import confirmation** dialog box appears and you have three options:

   - **Replace**: The existing material is replaced with the imported material.
   - **Merge**: Material properties that are different in the import file are added to the existing material. All the other properties remain unchanged.

     Use this option to import only certain elements of the material catalog, such as user attributes.
   - **Leave**: The existing material is not replaced and the material definitions in the import file are ignored.

   If you select the **Apply for all** check box, Tekla Structures uses the same option (**Replace**, **Merge**, or **Leave**) for all the existing materials that have the same name as the one being imported.

   If a user attribute with a different definition already exists, you are prompted to **Replace** or **Leave** the existing attribute.
6. Click **OK** to close the **Modify Material Catalog** dialog box.
7. Click **OK** in the **Save confirmation** dialog box to save the changes.

Units used in import and export

This table lists the units Tekla Structures uses when importing and exporting profile catalogs and material catalogs.

Type	Unit (if blank, no unit)
Boolean	
Integer	
String	
Ratio	
Strain	
Angle	degree
Length	mm
Deformation	mm
Dimension	mm
Radius of inertia	mm
Area	mm^2
Reinforcement area	mm^2
Transverse reinforcement area	mm^2/m
Area/unit length	mm^2/m
Volume	mm^3
Section modulus	mm^3
Moment of inertia	mm^4
Torsion constant	mm^4
Warping constant	mm^6
Force	N
Weight	kg
Distributed load	N/m
Spring constant	N/m
Mass/length	kg/m
Surface load	N/m^2
Strength	N/m^2
Stress	N/m^2
Modulus	N/m^2
Density	kg/m^3
Moment	Nm
Distributed moment	Nm/m
Rotation spring constant	Nm/rad
Temperature	K (°C)
Thermal dilation coefficient	1/K (1/°C)
Factor	

Customize the profile catalog

The profile catalog contains information about profiles, their rules and types, and the analysis and design properties of the profiles. Profiles are shown in a hierarchical tree grouped according to the rules.

By default, the profile catalog contains standard, environment-specific profiles and generic parametric profiles. You can add, modify, import, export, and delete profiles.

You can define your own user-defined profiles, which can be either fixed or parametric. Use the profile catalog to create new fixed profiles, either from scratch or by copying an existing one. Use the sketch editor or `.clb` files to create new parametric profiles.

Tekla Structures stores the profile catalog information in the `profdb.bin` file.

Important buttons in the profile catalog

When you work with the profiles, note the usage of the following buttons in the **Modify Profile Catalog** dialog box:

Button	Description
Update	Saves the changes of a single edited profile to the computer's memory until you click **OK**.
OK	Saves the changes in the model folder. Tekla Structures saves the modified catalog on the hard disk when you click **OK** to close the dialog box and then click **OK** in the **Save confirmation** dialog box.
Cancel	Closes the **Modify Profile Catalog** dialog box without saving the changes. Note that all changes made to the catalog will be lost even if you have clicked **Update**, because the changes have not been saved on the hard disk. The changes made to the catalog are visible during one session, because the catalog is using the computer's memory. When you start Tekla Structures the next time, the previous data is restored from the hard disk.

Tekla Structures stores the information of fixed profiles in the `profdb.bin` file. When you first open a model, Tekla Structures reads the data from the hard disk and stores it in the computer's memory.

When you select a profile, Tekla Structures reads the data from the computer's memory and displays it in the **Modify Profile Catalog** dialog box. This is faster than accessing the data from the hard disk.

How profiles are grouped together

In the profile catalog, the profiles are displayed in a hierarchical tree and they are grouped according to rules , such as the profile type (for example, **I profiles**) and the profile subtype (for example, **HEA**). To change how the profiles are grouped in the profile tree, you need to modify the rules.

The order in which you create the rules does not matter, only the location of the rules in the profile tree.

Tekla Structures reads the rules from top to bottom in the profile tree. Profiles are in the highest group where they meet the criteria defined in the rule. For example, a rule that collects **All profiles** overrides all rules that are below it in the profile tree.

Add a rule to the profile catalog

1. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Modify Profile Catalog** dialog box.
2. Right-click any existing rule and select **Add Rule**.

   TIP You can add a next level rule that creates a subgroup under an existing rule. Use the **Add Next Level Rule** command to add the next level rule.

   The **Profile manager rules** dialog box appears.
3. Define the rule properties.
   a. Enter a rule name in the **Rule name** box.
   b. Select the **Profile type** to which the rule is applied.
   c. Enter the **Name filter string** that defines the new rule.

      By default, the wildcard symbol (*) is entered, meaning “all entries”.

      For example, to group all catalog entries with names beginning with A, enter `A*` in the **Name filter string** box, or to group all catalog entries with names containing 100, enter `*100*`. Tekla Structures groups the catalog entries that meet your criteria under the new rule.
4. Click **OK** to close the **Profile manager rules** dialog box.
5. Click **OK** to close the **Modify Profile Catalog** dialog box.
6. Click **OK** in the **Save confirmation** dialog box to save the changes.

Modify a rule in the profile catalog

Profiles in the profile tree are listed in an alphabetical order, and rules are listed in the order you specify. To change the order in which the rules appear, use the **Move up** and **Move down** commands.

TIP If you want to delete a rule, right-click an existing rule and select **Delete Rule**.

---

1. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Modify Profile Catalog** dialog box.
2. Right-click any existing rule and select **Edit Rule**.

   The **Profile manager rules** dialog box appears.
3. Modify the rule properties.
4. Click **OK** to close the **Profile manager rules** dialog box.
5. Click **OK** to close the **Modify Profile Catalog** dialog box.
6. Click **OK** in the **Save confirmation** dialog box to save the changes.

See also

- Wildcards

Add user attributes to profiles

You can add your own attributes to profiles. For example, you can specify paint layer thickness, define the maximum grain size of concrete, sort out different profile types by material, or create profile aliases for converting between imperial and metric profiles.

1. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Modify Profile Catalog** dialog box.
2. On the **User attributes** tab, click **Definitions**.

   The **Modify Profile Properties** dialog box appears.
3. Click **Add** to add a new row.
4. To define a user attribute, click each item on a row.
   a. In the **Profile type** list, select a profile type to which the user attribute is applied.
   b. In the **Quantity type** list, select the type of information that the user attribute contains, for example, weight, area, ratio, or string.
   c. In the **Order** list, define the order in which the user attributes are shown in the dialog box. Larger values are shown first.
   d. In the **Property name** list, define a name for the property.

      The name is saved in the catalog and can be used in reports and templates. When **Property name** is used in a template,

`PROFILE.PROPERTY_NAME` indicates where the property name appears. For example, `PAINT_LAYER_THICKNESS`.

e. In the **Symbol** column, define an abbreviation that can be used for the property, such as `Ix` or `ct`.

f. In the **Label** column, define a label for the attribute.

5. Click **Update**.
6. Click **OK** to close the **Modify Profile Properties** dialog box.

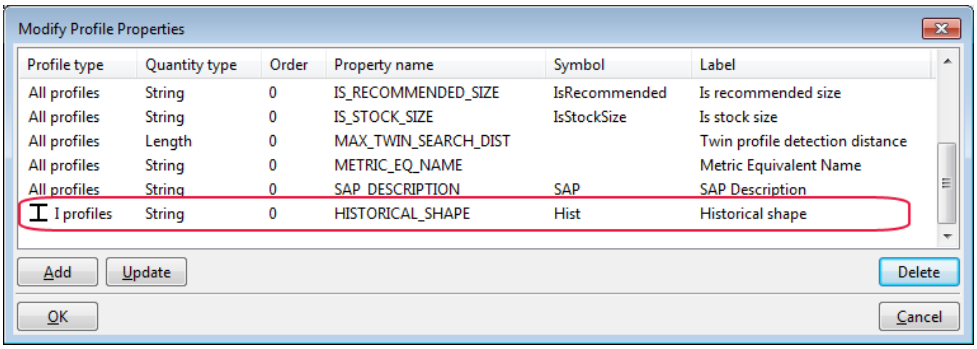
Example: Add a user attribute to a profile and use it in a rule

You can add your own attributes and their values to profiles. The user attributes can then be used, for example, in profile filtering.

This example shows how to add a user attribute for the rule for I profiles.

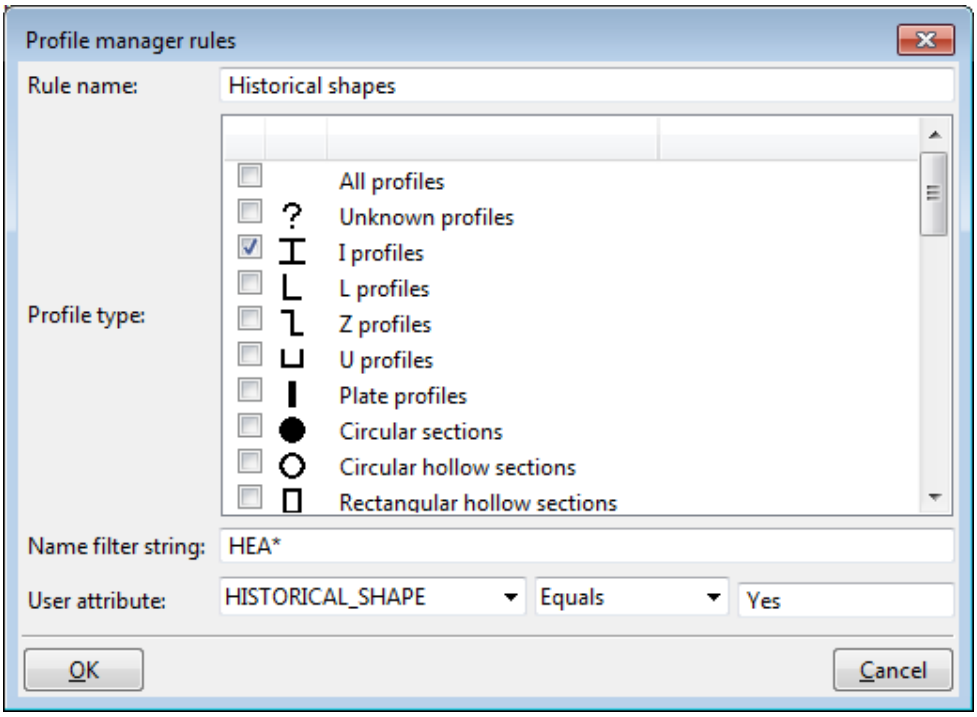
1. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Modify Profile Catalog** dialog box.
2. On the **User attributes** tab, click **Definitions**.

   The **Modify Profile Properties** dialog box appears.
3. Click **Add** to add a new row, then select the row and modify the properties as follows:
   - Set **Profile type** to **I profiles**.
   - Set **Quantity type** to **String**.
   - Set **Property name** to `HISTORICAL_PROFILE`.
   - Set **Symbol** to `Hist`.
   - Set **Label** to `Historical profile`.



4. Click **Update**, then click **OK**.
5. In the profile tree, select **I profiles**, then select **HEA**.
6. Right-click and select **Add Next Level Rule**.
7. In the **Profile manager rules** dialog box, set the rule properties as follows:
   - Set **Rule name** to `Historical profiles`.

- In **Profile type**, clear the **All profiles** check box and select the **I profiles** check box.
- Enter `HEA*` in the **Name filter string** box.
- Set **User attribute** to **HISTORICAL_PROFILE** and **Equals**, and enter `Yes` in the box next to the two other boxes.

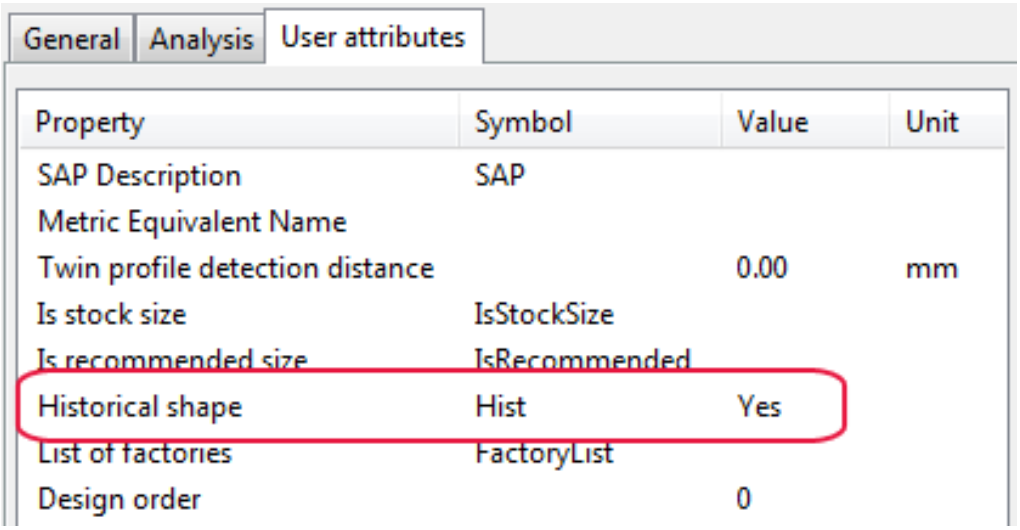


8. Click **OK**.

   Historical profiles appears in the profile tree.

9. Select the required historical profile, such as **HEA120**, in the profile tree.

10. On the **User attributes** tab, and change the **Value** field for **Historical profile** to `Yes`.



11. Click **Update**.
12. Click **OK** to close the **Modify Profile Catalog** dialog box.
13. Click **OK** in the **Save confirmation** dialog box to save the changes.

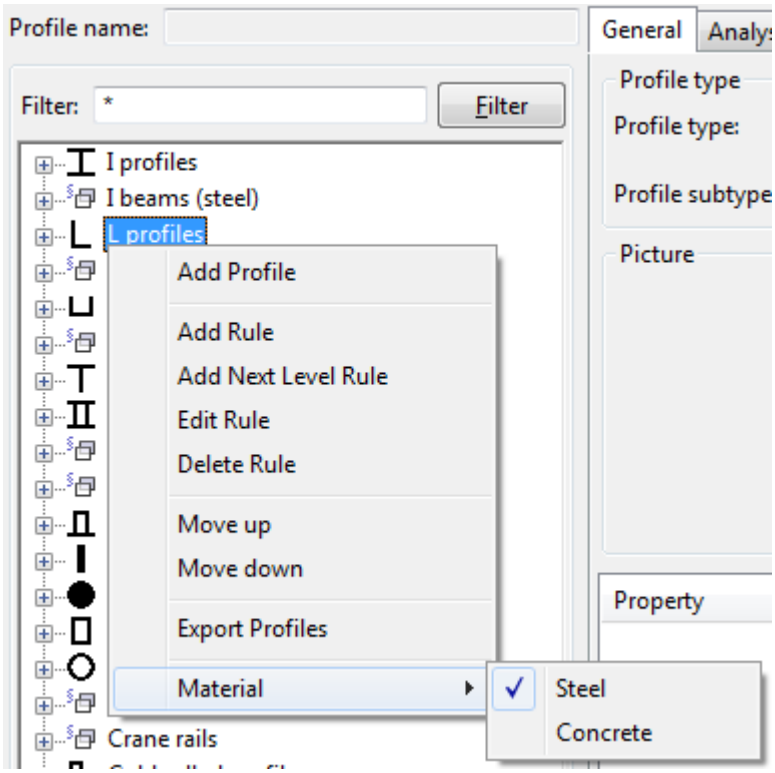
The next time that you open the profile catalog, the profiles appear under **Historical profiles** in the profile tree.

Associate profile types with a certain material

You can define which profiles are available for steel parts, concrete parts, or both. The associated profile type affects which profile types are shown in the **Select Profile** dialog box when you change the material of a part.

1. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Modify Profile Catalog** dialog box.
2. Select a profile type, for example, **L profiles**.
3. To associate the profiles with steel, right-click and select **Material** --> **Steel** .

A check mark next to **Steel** indicates that the profiles are available for steel parts.



4. To also make the selected profiles available for concrete parts, right-click and select **Material** --> **Concrete** .

   If needed, you can remove the check mark by clicking the material again.

5. Click **OK** to close the **Modify Profile Catalog** dialog box.
6. Click **OK** in the **Save confirmation** dialog box to save the changes.

See also

- Select and change the profile or material of a part

Delete a profile from the profile catalog

1. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Modify Profile Catalog** dialog box.
2. Select the profile that you want to delete.
3. Right-click and select **Delete Profile**.
4. Click **OK** to close the **Modify Profile Catalog** dialog box.
5. Click **OK** in the **Save confirmation** dialog box to save the changes.

Tekla Structures continues to show parts that use the deleted profiles in model views until you modify the parts or reopen the model. After that, parts that

have profiles that are not available in the profile catalog, are shown as sticks without a profile.

If the deleted profile used a custom cross-section definition, delete it separately to remove the cross-section from your model.

Import and export profiles

Import and export profiles to merge profiles across profile catalogs.

Profile catalogs are imported and exported as `.lis` files, sketched profiles as `.uel` files, and user-defined parametric profiles as `.clb` files.

When you export an entire profile catalog, Tekla Structures creates three separate files: `profiles.clb`, `profiles.lis` and `rules.lis`. The `.clb` file contains parametric profile definitions, if they are used in the profiles in the catalog, otherwise it is empty. The `profiles.lis` file includes the actual profile definitions and the `rules.lis` file the branch rules. When you export a branch of a profile catalog, the branch name is attached as prefix to the file names.

Importing and exporting is useful when you:

- upgrade to a newer version of Tekla Structures and want to use a customized profile catalog from a previous version
- want to combine profile catalogs that are stored in different locations
- want to share profile catalog information with other users
- want to combine profile catalogs across different environments.

Limitations of importing and exporting profiles

- You cannot import or export hard-coded profiles such as PROFILE_ZZ, PROFILE_CC, and PROFILE_CW.
- You cannot import profiles that do not have a defined cross section.
- If you have used a sketched profile or a user-defined parametric profile as the cross section for a fixed profile, you also need to import the sketched profile or the user-defined parametric profile to the new model.

TIP You can also download or share profiles using Tekla Warehouse.

Import profile catalog items

Tekla Structures has five types of profile catalog items: fixed profiles, hard-coded parametric profiles, sketched profiles, user-defined parametric profiles, and rule sets. Profiles and rule sets are imported to Tekla Structures models

as `.lis` files, sketched profiles as `.uel` files, and user-defined parametric profiles as `.clb` files.

If you are importing an entire profile catalog or a branch, we recommend that you save the related files in a separate folder. This makes the import process faster.

1. Open the model to which you want to import profile catalog items.
2. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Modify Profile Catalog** dialog box.
3. Click **Import** to import a single file, or **Import Directory** to import the contents of a file folder.
4. Select the import file or the import folder.
5. Click **OK**. Tekla Structures checks if there are duplicates in the profile names in the import file compared to the profile catalog.
   a. If the **Review import items** dialog box appears, there are duplicate profile names and you must select each duplicate and assign the action you want to perform with the following buttons:
      - **Leave**: The existing profile item is not replaced and the profile definitions in the import file are ignored.
      - **Merge**: Profile properties that are different in the import file are added to the existing profile. All the other properties remain unchanged.

        Use this option to import only certain elements of the profile catalog, such as user attributes.
      - **Replace**: The existing profile item is replaced with the imported profile item.
      - If you leave **Unknown** as the action for a profile item, it is not imported.

      You can select more than one profile item at a time by using the **Shift** and **Ctrl** keys and assign the same action to the entire selection.

      NOTE Each cross section definition has a unique name and ID number. If during an import, a cross section with the same name but different properties is found in the existing profile catalog, the cross section being imported is renamed by adding an incremental number at the end of the existing name.

   b. After you have selected the actions, click **Continue** to perform them.
6. Click **OK** to close the **Modify Profile Catalog** dialog box.
7. Click **OK** in the **Save confirmation** dialog box to save the changes.

Test and approve the catalog content, then export the new catalog and set it up to be used in models.

Export an entire profile catalog
Profile catalogs are exported from Tekla Structures models as `.lis`, `.uel`, and `.clb` files.

1. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Modify Profile Catalog** dialog box.
2. Click **Export**.
3. Browse for the folder where you want to save the export files.

   By default, the files are saved to the current model folder. For faster profile catalog import, we recommend that you create a separate sub-folder for the catalog files.
4. Click **OK** to close the **Modify Profile Catalog** dialog box.

Set up the catalog to be used in models.

Export a part of the profile catalog
If you do not want to export an entire profile catalog, you can export a branch of the profile tree, meaning all the profiles grouped under one rule, or a single profile. Profiles and rule sets are exported from Tekla Structures models as `.lis` files, sketched profiles as `.uel` files, and user-defined parametric profiles as `.clb` files.

1. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Modify Profile Catalog** dialog box.
2. Select profiles to be exported.
   - To export a branch of the profile tree, right-click the branch and select **Export Profiles**.
   - To export a single profile, right-click the profile and select **Export Profile**.
3. Browse for the folder where you want to save the export files.

   By default, the files are saved to the current model folder.

   If you are exporting a single profile, enter a name for the file.
4. Click **OK**.
5. Click **OK** to close the **Modify Profile Catalog** dialog box.

Example of a profile export file

The export `.lis` file is divided into specific sections.

The first row in the file is `PROFILE CATALOG EXPORT VERSION = n`, where `n` is the version number.

WARNING Do not delete this row. If the row does not appear in the file, the import is canceled.

The next section defines the hierarchical tree structure that is used to display the contents of the catalog.

The section after that contains the profiles.

Fixed profiles

```
PROFILE_NAME = "HEA120";
{
TYPE = 1; SUB_TYPE = 1001; COORDINATE = 0.000;
{
"FLANGE_SLOPE_RATIO"    0.000000000E+000
"ROUNDING_RADIUS_2"     0.000000000E+000
"ROUNDING_RADIUS_1"     1.200000000E+001
"FLANGE_THICKNESS"      8.000000000E+000
"WEB_THICKNESS"         5.000000000E+000
"WIDTH"                 1.200000000E+002
"HEIGHT"                1.140000000E+001
```

Fixed user-defined profiles

Fixed user-defined profiles can have more than one cross section. The profile type for fixed user-defined profiles is 998. `SUB_TYPE` refers to the name of the cross section definition. When importing fixed user-defined profiles, the relevant cross section definitions must be in the same import file as the profile.

```
PROFILE_NAME = "TAN_HK_TEST_2_CS";
{
TYPE = 998; SUB_TYPE = 253; COORDINATE = 0.000;
{
"EQUIVALENT_TYPE"       11
"FLANGE_SLOPE_RATIO"    0.000000000E+000
"ECCENTRICITY_Y"        0.000000000E+000
"ECCENTRICITY_X"        0.000000000E+000
"ROUNDING_RADIUS_2"     0.000000000E+000
"FLANGE_THICKNESS_2"    0.000000000E+000
"WEB_THICKNESS_2"       0.000000000E+000
```

Cross section definitions

```
CROSS_SECTION_NAME = "MY_OWN_PROFILE
POINT_NUMBER = 1;
POINT_X =  200.00;
POINT_Y = -200.00;
CHAMFER_TYPE = 0;
CHAMFER_X = 0.00;
CHAMFER_Y = 0.00;
POINT_NUMBER = 2;
POINT_X =  200.00;
POINT_Y =  200.00;
CHAMFER_TYPE = 0;
CHAMFER_X = 0.00;
CHAMFER_Y = 0.00;
```

Units used in import and export

This table lists the units Tekla Structures uses when importing and exporting profile catalogs and material catalogs.

Type	Unit (if blank, no unit)
Boolean	
Integer	
String	
Ratio	
Strain	
Angle	degree
Length	mm
Deformation	mm
Dimension	mm
Radius of inertia	mm
Area	mm^2
Reinforcement area	mm^2
Transverse reinforcement area	mm^2/m
Area/unit length	mm^2/m
Volume	mm^3
Section modulus	mm^3
Moment of inertia	mm^4
Torsion constant	mm^4
Warping constant	mm^6
Force	N
Weight	kg
Distributed load	N/m
Spring constant	N/m
Mass/length	kg/m
Surface load	N/m^2
Strength	N/m^2
Stress	N/m^2
Modulus	N/m^2
Density	kg/m^3
Moment	Nm
Distributed moment	Nm/m
Rotation spring constant	Nm/rad

Type	Unit (if blank, no unit)
Temperature	K (°C)
Thermal dilation coefficient	1/K (1/°C)
Factor	

Import and export sketched profiles
To use a sketched profile in other Tekla Structures models, export the profile as a `.uel` file, then import the file into another Tekla Structures model.

We recommend that you use the profile catalog to import and export sketched profiles. You can also use the **Applications & components** catalog to import sketched profiles together with related custom components.

The exported `.uel` file contains information about the version of Tekla Structures from which it was exported. You can import the file into the same or newer version of Tekla Structures, but you cannot import a `.uel` file from a newer version into an older version.

Export sketched profiles

1. Open the Tekla Structures model you want to export from.
2. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Modify Profile Catalog** dialog box.
3. Right-click the profile you want to export and select **Export Profile**.
4. In the **Export Profile Catalog** dialog box, enter a name for the export file in the **Selection** box.
5. If you want to save the export file to a specific location, browse for the folder.

   By default, Tekla Structures saves the export file in the current model folder.
6. Click **OK**.

Import sketched profiles
After you have exported sketched profiles to a `.uel` file, you can import them to another Tekla Structures model.

TIP To automatically import all `.uel` files from a folder when creating a new model, use the advanced option .

---

1. Open the Tekla Structures model you want to import to.
2. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Modify Profile Catalog** dialog box.
3. Click **Import**.
4. In the **Import Profile Catalog** dialog box, select `*.uel` from the **Filter** list.

5. Select the file to import.
6. Click **OK**.
7. Click **OK** to close the **Modify Profile Catalog** dialog box.
8. Click **OK** in the **Save confirmation** dialog box to save the changes.

Create your own profiles

You can create your own profiles and save them in the profile catalog.

Use any of the following methods to create user-defined profiles in Tekla Structures:

Profile type	Creation methods
Fixed profile	• Create user-defined cross sections in profiles (page 247) • Create a fixed profile (page 253) • Create a fixed profile by copying an existing profile (page 254) • Create a fixed profile based on a parametric profile (page 255)
Parametric profile	• Create parametric profiles using .clb files (page 256) • Create parametric profiles by sketching (page 264)
Parametric profile with variable cross sections	• Create parametric profiles with variable cross sections (page 289)

Create user-defined cross sections in profiles

You can use user-defined cross sections for creating fixed profiles. Define the cross sections before creating the profile.

Use any of the following methods to define a cross section:

- Define a cross section using a polygon without or with inner contours.

  Use this method to create a cross section with fixed dimensions..
- Define a cross section using a plate.

  Use this method if you have a contour plate in the model.
- Define a cross section using a DWG file.

  Use this method if you have a `.dwg` file of the profile you that want to define.

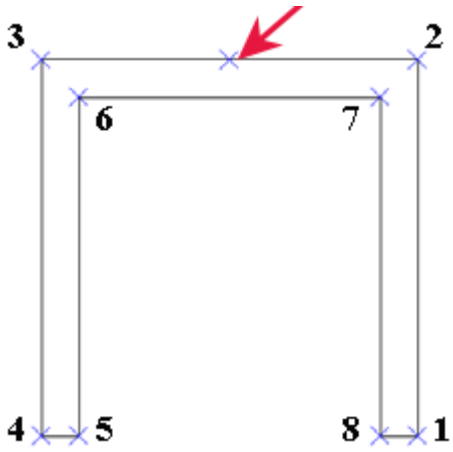
Define a cross section without inner contours using a polygon
Define a cross section with no inner contours by picking the shape of the cross section.

Because the cross section shape disappears after you have clicked the middle mouse button to close the shape, picking the center point of the cross section can be difficult.

To make it easier to define the shape, insert a reference model of the cross section in the model, and use the reference model as the basis for picking the cross section shape. Alternatively, you can create a few construction lines or points in the model and use them to define the cross section shape.

1. On the **File** menu, click **Catalogs** --> **Define profiles** --> **Define cross section using polygon**.
2. Pick the corner points of the cross section to define the shape.

   Start at the bottom-right corner and pick the points counter clockwise.
3. Pick the start point, then click the middle mouse button to close the shape.
4. Pick the center point of the cross section.

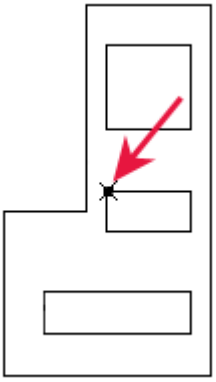


5. In the **User Profile Cross Section** dialog box, enter a name for the cross section.
6. Click **OK** to close the **User Profile Cross Section** dialog box.
7. Click **OK** in the **Save confirmation** dialog box to save the changes.

Use this cross section when you add a new profile to the profile catalog. The **Profile type** is **User-defined, fixed**.

Define a cross section with inner contours using a polygon
Define a cross section with inner contours by picking the shape of the cross section.

1. On the **File** menu, click **Catalogs** --> **Define profiles** --> **Define cross section using polygon**.
2. Pick the corner points of the cross section to define the shape, then pick the start point to close the shape.
3. For each inner contour, pick the corner points of the cross section inner contour, then pick the start point to close the shape.
4. When you have finished picking all inner contours, click the middle mouse button.
5. Pick the center point of the cross section.



6. In the **User Profile Cross Section** dialog box, enter a name for the cross section.
7. Click **OK** to close the **User Profile Cross Section** dialog box.
8. Click **OK** in the **Save confirmation** dialog box to save the changes.

Use this cross section when you add a new profile to the profile catalog. The **Profile type** is **User-defined, fixed**.

Define a cross section using a plate

If you have a contour plate in the model, you can define a cross section using a contour plate.

1. Create a contour plate that includes all the chamfers.
2. On the **File** menu, click **Catalogs** --> **Define profiles** --> **Define cross section using plate**.
3. On the **Parameters** tab of the **Profile Cross-Section from Plate (10)** dialog box, enter a name in the **Section name** and **Profile name** fields.

   Other properties are optional.
4. Click **OK**.

5. Select the contour plate.

Tekla Structures creates the cross section with the shape of the contour plate.

Properties: Profile cross-section from plate (10)

Use the **Parameters** tab to define the profile properties in the **Profile cross-section from plate (10)** component.

Option	Description
Section name	Name of the cross section shown in the **Modify Profile Catalog** dialog box. If you leave this box empty, no profile is created.
Profile name	Name of the profile shown in the **Beam** properties, and in the **Modify Profile Catalog** dialog box. If you leave this box empty, no profile is created.
Save to	The location of the profile catalog. Select one of the following options: • **Model directory**: The current model folder. • **Global directory**: `..\ProgramData\Trimble\Tekla Structures\<version>\environments\<environment>\profil` • **Do not save**: Does not save the profile. This is useful for testing.
Min distance between points	The minimum distance between the corner points of the cross section. To create simpler drawings of complicated cross sections, increase this value.
Center point offset	The origin of the plate defines the location of the profile reference line. Enter an offset value to move the reference line, relative to the cross section.
Coordinate system	Select one of the following options: • **Use local** • **Use global xy-plane**
Mirroring	Select one of the following options: • **Do not mirror** • **Mirror to x-direction** • **Mirror to y-direction**

Option	Description
	• **Mirror to x- and y-direction**

Use this cross section when you add a new profile to the profile catalog. The **Profile type** is **User-defined, fixed**.

Define a cross section using a DWG file
if you have a `.dwg` file of the profile you that want to define, you can import the cross section and add it as a DWG profile to the profile catalog.

Before you start defining a cross section using a DWG file:

- Save the outline of the cross section as a DWG file. Ensure that the DWG file only contains the outline of the profile.
- Make sure that the cross section is created as a closed polyline.
- Make sure that the outline consists of only one closed polyline. You cannot, for example, define holes to your cross section with this method. If you need holes or openings, use the polygon or the plate creation method.
- Remove hatching and unnecessary lines from the DWG file. Tekla Structures imports all the lines it finds in the DWG file.
- If there are blocks in the DWG file, they must be exploded.

Tekla Structures supports DWG files that have been created using version ACAD2012 or earlier.

1. Open a model.
2. On the **File** menu, click **Catalogs** --> **Define profiles** --> **Define cross section using DWG file**.
3. On the **Parameters** tab of the **DWG Profile to Library (6)** dialog box, browse for the DWG file.
4. Define the cross section properties.
5. Click **OK**.
6. In the model, pick the start and the end points of the cross section to be imported.

Tekla Structures imports the cross section and places the profile reference line at the origin of the DWG file.

Properties: DWG Profile to Library (6)

Use the **Parameters** tab to define the profile properties in the **DWG profile to library (6)** component.

Option	Description
Input file	Browse for the DWG file to be imported.
Section name	Name of the cross section shown in the **Modify Profile Catalog** dialog box.

Option	Description
Profile name	Name of the profile shown in the **Modify Profile Catalog** dialog box.
Save to	The location of the profile catalog. Select one of the following options: • **Model directory**: The current model folder. • **Global directory**: `..\ProgramData\Trimble\Tekla Structures\<version>\environments\<environment>\profil` • **Do not save**: Does not save the profile. This is useful for testing.
Min distance between points	The minimum distance between the corner points of the cross section. To create simpler drawings of complicated cross sections, increase this value.
Center point offset	The origin of the plate defines the location of the profile reference line. Enter an offset value to move the reference line, relative to the cross section.

Use this cross section when you add a new profile to the profile catalog. The **Profile type** is **User-defined, fixed**.

Modify a user-defined cross section

You can modify cross sections that have been defined using a polygon, a plate, or a DWG file.

1. On the **File** menu, click **Catalogs** --> **Define profiles** --> **Edit Polygon Cross Section**.
2. In the **Modify Cross Section** dialog box, select the cross section that you want to modify.

   TIP If you want to delete a cross section, select the cross section, then click **Delete**.

3. Modify the cross section point properties.
   - **Number** refers to each point picked when the cross section was created, in numerical order. The first point picked is 1, the second 2, and so on.
   - **Chamfer** refers to the chamfer shape.

- **x:** and **y:** apply to the chamfer type. For example, if you want the chamfer to be equal on both sides of the angle, only enter a value for **x:**.

  For an uneven chamfer, enter values for **x:** and **y:**.

4. Click **Update**.
5. Click **OK** to close the **Modify Cross Section** dialog box.
6. Click **OK** in the **Save confirmation** dialog box to save the changes.

Create fixed profiles

You can create completely new fixed profiles or create copies of existing fixed profiles. You can also convert parametric profiles into fixed profiles.

Create a fixed profile

You can create fixed profiles with a single cross section or with multiple cross sections.

Cross sections affect the total weight of the profile.

WARNING If you create a profile with multiple cross sections, create the cross sections with the same number of corner points and in the same order.

---

1. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Modify Profile Catalog** dialog box.
2. Right-click anywhere in the profile tree, then select **Add Profile**.

   A new fixed profile with the name **PROFILE1** is created.
3. Define the properties of the profile.
   a. In the **Profile name** field, enter a new name for the profile.

      The profile name must be in upper case letters, with no spaces. Tekla Structures automatically converts lower case letters to upper case letters.

   b. From the **Profile type** list, select **User-defined, fixed**.

   c. From the **Profile subtype** list, select the cross section that you want to use.

      If you have created your own user-defined cross sections (page 247), you can use one of them.

   d. Under **Equivalent type**, select a profile type that matches the new cross section as closely as possible. This is important because some connections only work for certain types of profiles.

      The equivalent type and the profile dimensions, such as height and width, affect which connections can be applied to the profile. An unsuitable equivalent type or missing dimension values may result in problems with connections.

e. Click **Update**.

4. Modify the dimension values.

   Always enter values for the dimensions **Height h** and **Width b**, as these values affect how Tekla Structures displays the profiles. If the values are 0, the part is drawn as a line.

5. Under **Cross section**, define a relative location for each cross section.

   a. From the **Number** list, select the number of the cross section.

   b. In the **Relative location** field, enter the location of the cross section.

      This value indicates the location of the cross section along the axis: 0.0 for the start end and 1.0 for the second end. If you only have a single cross section, select `1` for **Number** and enter `0.000` for **Relative location**.

   c. After defining each cross section, click **Update**.

6. Click **Add** to add more cross sections, if needed.

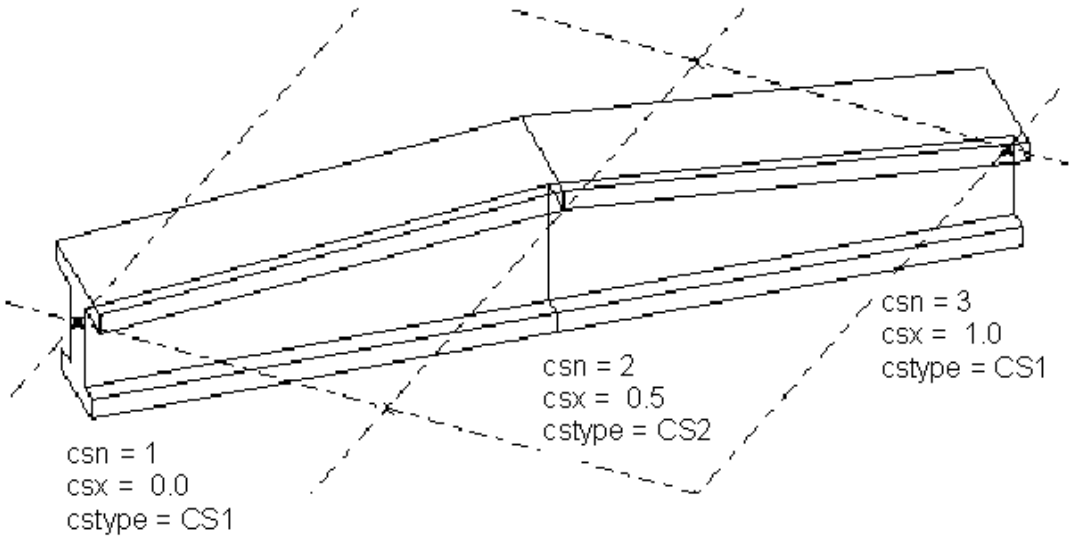
   - If you want to use a different cross section in the profile, select a new one from the **Profile subtype** list.
   - If you want to remove a cross section, select the cross section from the **Number** list, then click **Remove**.

7. Click **OK** to close the **Modify Profile Catalog** dialog box.

8. Click **OK** in the **Save confirmation** dialog box to save the changes.

Example

For a pitched profile, you need two cross sections with the same center point height. The **Relative location** value is `0.0` for the first cross section, `0.5` for the second cross section, and `1.0` for the third cross section.



Create a fixed profile by copying an existing profile
You can create new fixed profiles by modifying a copy of an existing, similar profile.

1. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Modify Profile Catalog** dialog box.
2. Select a fixed profile that is similar to the one that you want to create.
3. Right-click, then select **Copy Profile**.

   A new profile with the name **<existing_profile_name COPY>** is created.
4. In the **Profile name** field, enter a new name for the profile.

   The profile name must be in upper case letters, with no spaces. Tekla Structures automatically converts lower case letters to upper case letters.
5. Modify the profile properties on the **General**, **Analysis**, and **User attributes** tabs.
   - The **General** tab contains information about profile types and dimensions.

     WARNING Under **Equivalent type**, select a profile type that matches the new cross section as closely as possible. This is important because some connections only work for certain types of profiles.

     Always enter values for the dimensions **Height h** and **Width b**, as these values affect how Tekla Structures displays the profiles. If the values are 0, the part is drawn as a line.

     The equivalent type and the profile dimensions, such as height and width, affect which connections can be applied to the profile. An unsuitable equivalent type or missing dimension values may result in problems with connections.
   - The **Analysis** tab contains information about the properties used in structural analysis. The structure can be analyzed with different analysis software.
   - The **User attributes** tab is for viewing or entering user attributes for profiles.
6. Click **Update**.
7. Click **OK** to close the **Modify Profile Catalog** dialog box.
8. Click **OK** in the **Save confirmation** dialog box to save the changes.

Create a fixed profile based on a parametric profile
You can convert an existing parametric profile into a fixed profile.

1. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Modify Profile Catalog** dialog box.
2. Select a parametric profile from the list.
3. Right-click, then select **Add Profile**.

A new standard fixed profile is created with the profile values of the parametric profile.

Modify a fixed profile
If necessary, you can modify existing fixed profiles using the profile catalog.

NOTE The fixed profiles conform to industry standards. Only administrators should modify them.

---

1. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Modify Profile Catalog** dialog box.
2. Select a fixed profile  in the tree and modify its properties.
   - The **General** tab contains information about profile types and dimensions.
   - The **Analysis** tab contains information about the properties used in structural analysis. The structure can be analyzed with different analysis software.
   - The **User attributes** tab is for viewing or entering user attributes for profiles.
3. When you have finished modifying the profile, click **Update**.
4. Click **OK** to close the **Modify Profile Catalog** dialog box.

   Tekla Structures asks if you want to save the changes to the model folder.
5. In the **Save confirmation** dialog box, click **OK** to save the changes.

Create parametric profiles using .clb files
You can create new parametric profiles using `.clb` files.

Follow the example workflow below to create a parametric profile with `.clb` files.

How the .clb, components.clb and profitab.inp files work together
When you create new parametric profiles using this method, you need these files.

- `.clb`

  This file contains the cross section definitions. Create a new `.clb` file in the `..\ProgramData\Trimble\Tekla Structures\<version>\environments\common\inp` folder for each parametric profile you define.

- `components.clb`

  This file contains a list of all `.clb` files that contain cross section definitions. When you create a new `.clb` file, you need to add its file name to the `components.clb` file located in the `..\ProgramData\Trimble\Tekla Structures\<version>\environments\common\inp` folder.

- `profitab.inp`

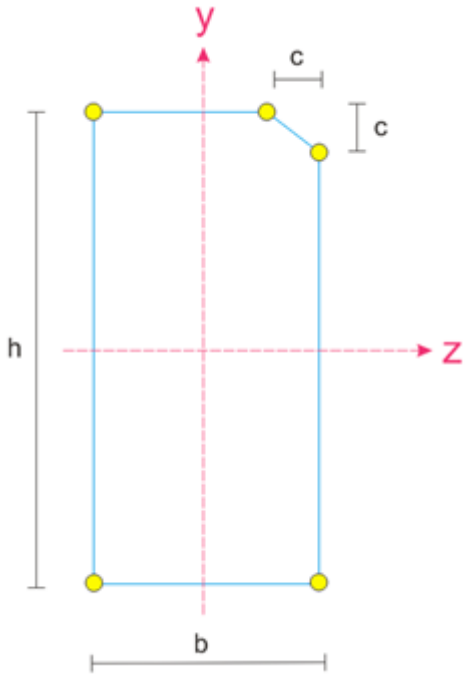
  This file is the link between the `.clb` files and the profile catalog. This file contains a list of all parametric profiles available in Tekla Structures. The file controls how the parametric profiles are displayed in the **Modify Profile Catalog** dialog box. When you want to take a new parametric profile into use, you must add the needed profile definitions, such as the profile type, prefix and the unit of measurement, to the `profitab.inp` file. The `profitab.inp` file is located under the environment folder in `..\ProgramData\Trimble\Tekla Structures\<version>\environments\<environment>\`. The exact file location might vary depending on the folder structure of your environment files .

  Tekla Structures searches for the `profitab.inp` file in the standard search order and then from the folder indicated by the advanced option `XS_PROFDB`.

Plan the shape and point coordinates of the profile

Start by defining the shape and point coordinates of the new profile on paper.

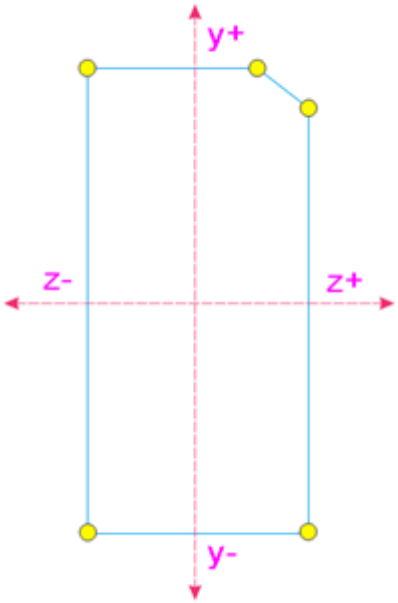
1. Design the profile on paper.
   a. Draw the cross section outline.
   b. Add the corner points.
   c. Add the dimensions.
   d. Place the y-z coordinate axis center point in the middle of the cross section.



2. Define the y and z coordinate directions.

   For example:

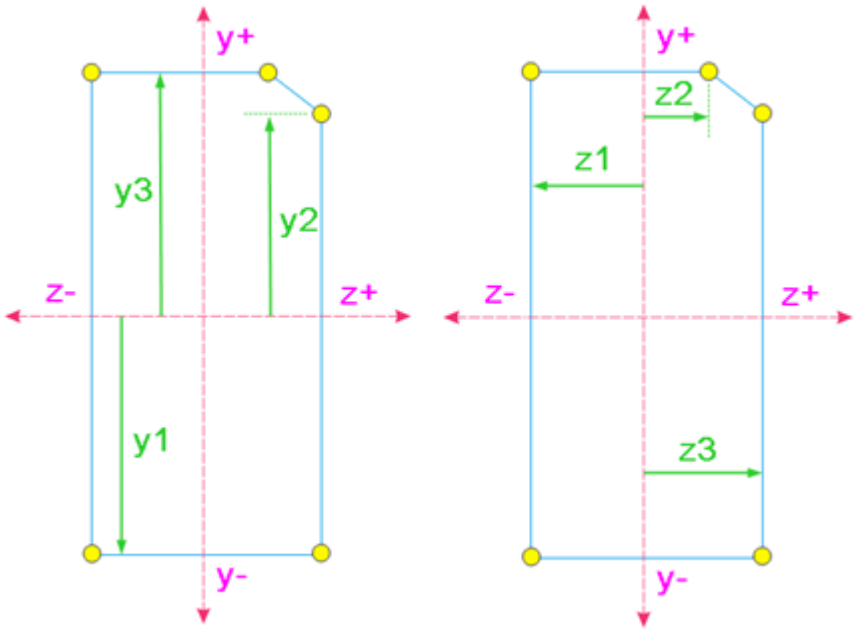
   - positive y axis: up
   - negative y axis: down
   - positive z axis: on the right
   - negative z axis: on the left



3. Define the y and z vectors.

   For example:

   - y1, y2, y3
   - z1, z2, z3

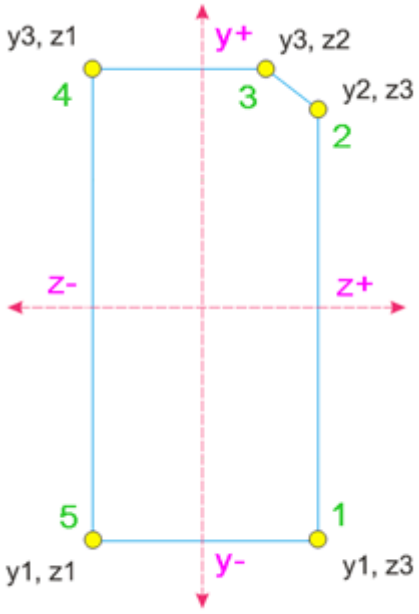


4. Make coordinate pairs for the points.

   Assign y, z vector pairs to each point. Start from the lower right corner and define the points in counterclockwise order.

   For example:

   - point 1: y1 z3
   - point 2: y2 z3
   - point 3: y3 z2
   - point 4: y3 z1
   - point 5: y1 z1



Create the .clb file

After defining the shape and point coordinates of the profile, continue by creating the `.clb` file.

1. Create a new `.clb` file using any standard text editor, such as Microsoft Notepad.
2. Define a library name to be used in the `profitab.inp` file for this profile.

   For example:

```
library_id "1Gen"
```

3. Define a cross section name to be used in the `profitab.inp` file for this profile.

For example:

```
Section_type
{
name "RectChamfer"
```

4. Define the dimensions of the cross section.

   For example:

```
base_attribute
{
name "h"
description "albl_Height"
type dimension
default 1000
}
```

5. Define the coordinates of the profile.

   The coordinates must be the same as the y and z vectors that you defined earlier. Define the default values.

   For example:

```
expression
{
  name "y1"
type y
  default -400
formula -h/2
}
```

6. Define the geometry of one or several faces of the profile.

   For example:

```
geometry
{
name "default"
face
  {
  index 0
  point 0 y1 z3
  point 0 y2 z4
  point 0 y3 z4
  point 0 y4 z3
  point 0 y4 z2
  point 0 y3 z1
  point 0 y2 z1
  point 0 y1 z1
  }
face
  {
  index 1
  point 1 y5 z7
  point 1 y6 z8
  point 1 y7 z8
  point 1 y8 z7
  point 1 y8 z6
  point 1 y7 z5
  point 1 y6 z6
  point 1 y5 z6
  }
}
```

NOTE The index number refers to the point number: 0=start point of the beam, 1=end point of the beam.

7. Save the `.clb` file in the `..\ProgramData\Trimble\Tekla Structures\<version>\environments\common\inp` folder.
8. In a text editor, open the `components.clb` file.
9. Add your profile definition to the `components.clb` file by adding the following line:

```
Include ”new_file_name.clb” // give comment
```

10. Save the `components.clb` file.

Add profile definitions to the profitab.inp file

Before you start to use the new parametric profile, add the profile definitions to the `profitab.inp` file.

1. In Windows, browse to the environment folder in `..\ProgramData\Trimble\Tekla Structures\<version>\environments\<environment>\` and find the `profitab.inp` file.
2. Copy the `profitab.inp` file to a model, project, or firm folder.
3. In a standard text editor, such as Microsoft Notepad, open the `profitab.inp` file in the new location.
4. Under a suitable category, add a new line for the profile definition.

   Use the following syntax:

```
Prefix
! Type ! SO ! Z ! MI ! MA ! G3-NAME ! Z3-NAME !
```

   An example of a profile definition:

```
PNL_A
! USER ! 0 ! ! 2 ! 3 !1Gen.RectChamfer !h*b-[c]
```

5. Save the file.

   The profile is now available in the profile catalog. You might have to restart Tekla Structures for the change to take effect.

Properties used in profitab.inp

Use these properties when you define new parametric profiles using the `profitab.inp` file.

Property	Description
`Prefix`	Prefix of the parametric profile. The prefix is shown in the profile catalog. For example, `PNL_A`.

Property	Description
`Type`	Type of the parametric profile. The profile types are or include the following: I, L, Z, U, PL, D, PD, P, C, T, HK, HQ, ZZ, CC, CW, CU, EB, BF, SPD, EC, ED, EE, EF, EZ, EW, 102, 103, 104, 105, 106, USER For example, in the default environment, parametric profiles with prefixes PD, EPD, CHS, CFCHS, O, Ø, and TUBE all group under the type PD, and appear under **Circular hollow sections** in the profile catalog.
`SO`	Sorting order. The options are: • `-1`: Decreasing sorting order • `+1`: Increasing sorting order • `0`: No sorting order • `-2`: Name increasing, value decreasing • `+2`: Value increasing, name decreasing For example, if your profile is PLT200*10 or PLT10*200 and the sorting order is `+2`, the result in the output (such as a report) for both cases is PLT200*10. If the sorting order is `-2`, the result for both cases is PLT10*200.
`Z`	Unit of measurement. The options are: • `0`: millimeters • `1`: inches • `2`: feet • `3`: centimeters • `4`: meters
`MI`	Minimum number of parameters you can use with the parametric profile. For example, the rectangular hollow section SHS has the following **Profile subtypes**: **h*t**, **h*b*t**, **h1*b1-h2*b2*t**. If you define SHS with a minimum of two and a maximum of two parameters, you only have the option **h*t** available in the **Select Profile** dialog box.
`MA`	Maximum number of parameters you can use with the parametric profile.
`G3-NAME`	Refers to a cross section file (`.clb` file). Can be a combination of a library id and the name of a cross section, separated by a full stop. For example, `1Gen.RectChamfer`.

Property	Description
`Z3-NAME`	Defines how the profile parameters relate to the parameters in the cross section file. Parameters in the order of appearance in the `.clb` file, optional parameters in square brackets. For example, `h*b-[c]`. Can also be the name of the detailing component.

Create parametric profiles by sketching

You can create parametric user-defined profiles by sketching. You can change the dimensions of parametric profiles each time that you use them in a model.

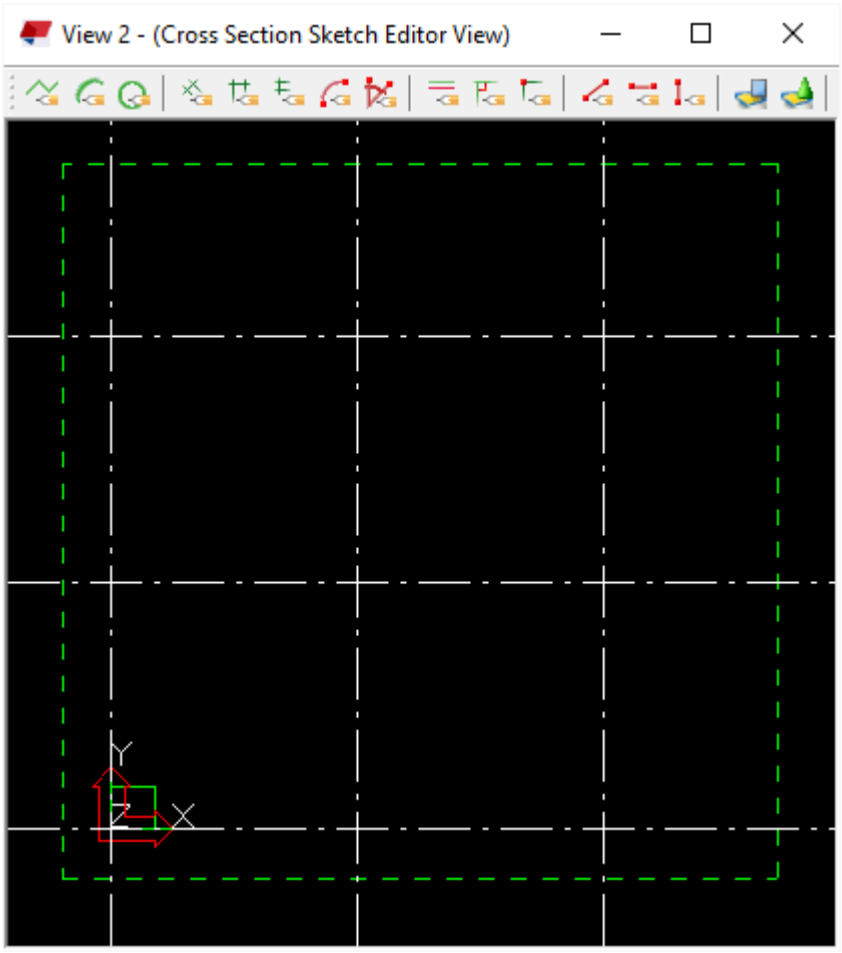
- Use the cross section sketch editor to create and modify sketched profiles.
- The **Sketch Browser** shows the objects of a sketched profile.
- Use the **Variables** dialog box to define the properties of a sketched profile.

Open the sketch editor

1. Open a Tekla Structures model.
2. On the **File** menu, click **Editors** --> **Define cross section in sketch editor**.

Tekla Structures opens the sketch editor, the **Sketch Browser**, and the **Variables** dialog box.

When you first open the sketch editor, the view is empty. The grid coordinates and labels that you see in the sketch editor depend on the grid properties of your actual Tekla Structures model.

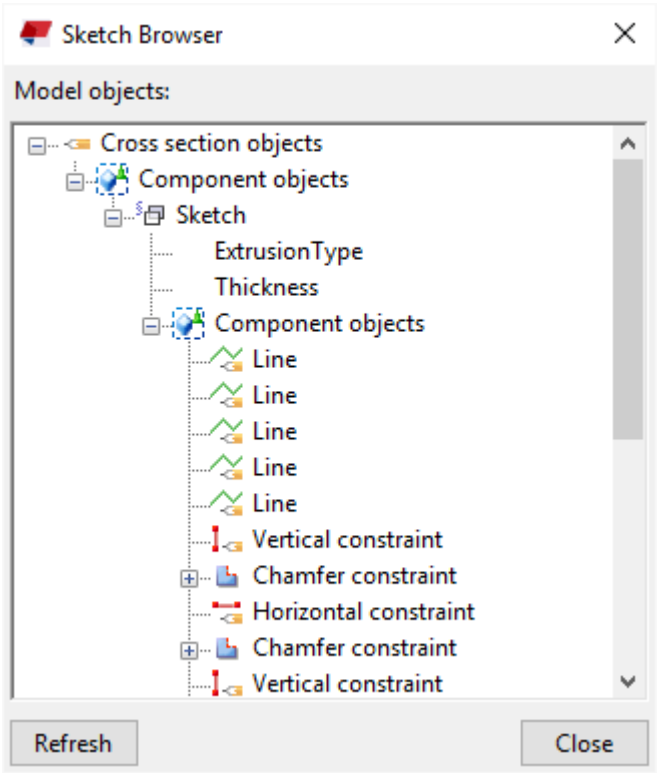


Sketch Browser

The **Sketch Browser** shows the objects (lines, arcs, circles, constraints, dimensions, and chamfers) of a sketched profile in a hierarchical, tree-like structure.

The **Sketch Browser** automatically opens when you open the sketch editor.

When you click an object in the sketch editor, Tekla Structures highlights the object in the **Sketch Browser**.

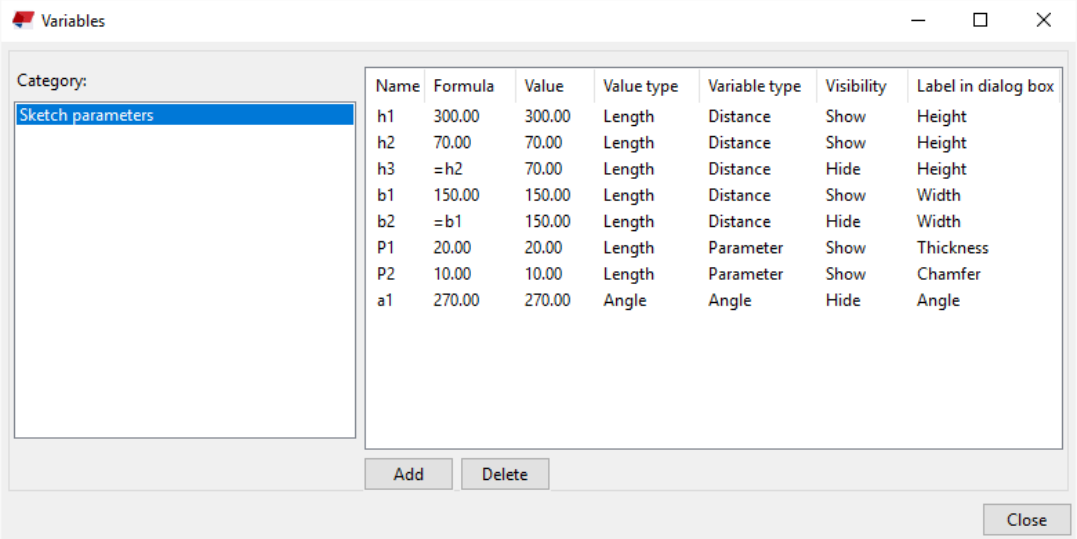


The **Sketch Browser** shows the following information about each sketched profile:

- Extrusion type (0, 1, or 2) and thickness of the sketched profile
- Lines, arcs, and circles
- Constraints
- Distances and dimensions and their values
- Chamfers and their type (0=**None**, 1=**Line** ... 7=**Line and arc**) and dimensions.

Variables in sketched profiles
Variables can define fixed properties, or they can include formulas, so that Tekla Structures calculates the property value each time you use the profile in a model.

Use the **Variables** dialog box to define the properties of a sketched profile. The **Variables** dialog box automatically opens when you open the sketch editor.



NOTE The **Variables** dialog box functions the same way as the corresponding dialog box in the custom component editor. For more information on how to use variables, see Add variables to a custom component.

Sketch the outline of a profile

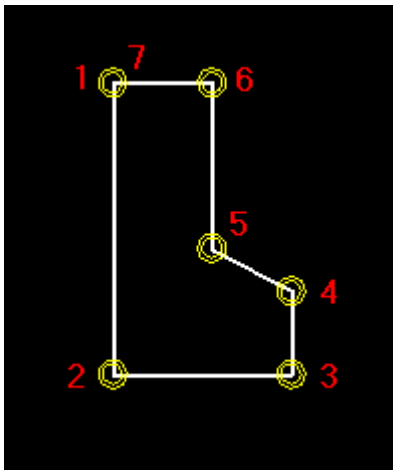
When you create a new sketched profile, start by sketching the outline and the holes of the profile using lines, arcs, and circles.

Unless you are creating a profile of a consistent thickness, such as a cold-rolled profile, ensure that you create a closed shape.

Sketch a polyline

You can create line segments in the sketch editor by picking points. Tekla Structures automatically creates coincident constraints between the line segments and shows a chamfer symbol where line segments meet.

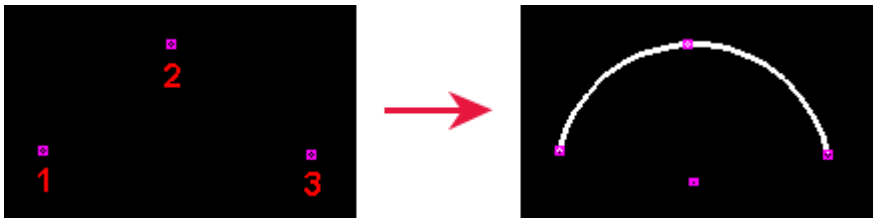
1. Open the sketch editor. (page 264)
2. Click the **Sketch polyline** button:  .
3. Pick points to create each line segment.
4. Click the middle mouse button to create the polyline.



Sketch an arc

You can create an arc in the sketch editor by picking three points.

1. Open the sketch editor. (page 264)
2. Click the **Sketch arc** button:  .
3. Pick three points to define the arc.

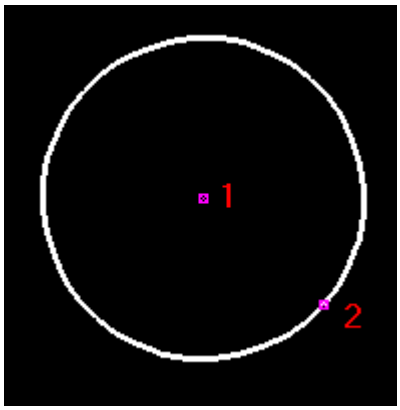


TIP You can use the advanced option XS_CS_CHAMFER_DIVIDE_ANGLE to define the smoothness of the arc.

Sketch a circle

You can create a circle in the sketch editor by picking two points.

1. Open the sketch editor. (page 264)
2. Click the **Sketch circle** button:  .
3. Pick a point to indicate the center of the circle **(1)**.
4. Pick a point to indicate the radius of the circle **(2)**.



Refine the shape of a sketched profile by adding a constraint
After you have sketched the outline of a profile, use *constraints* to refine your sketch and lock the shape.

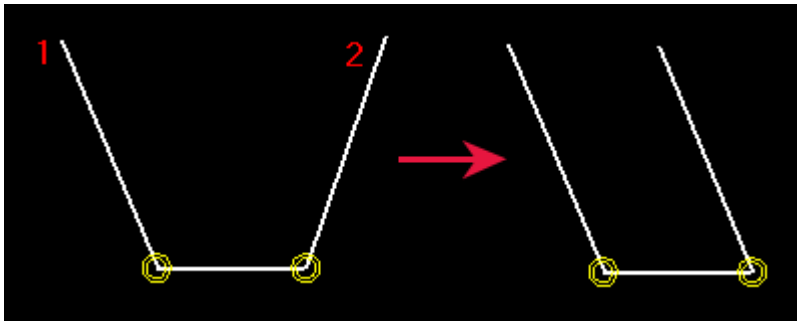
For example, you can straighten lines, create 90 degree angles, force lines to meet, close the shape, and add chamfers in corners.

To straighten the entire profile, use horizontal and vertical constraints in conjunction with other constraints. Although the shape is locked, you can still rotate the profile in the model.

Add a parallel constraint
You can use a parallel constraint to force two lines in a sketched profile to be parallel to each other.

Before you begin, sketch the outline of the profile in the sketch editor. (page 267)

1. Click the **Parallel constraint** button:  .
2. Select a line in the sketch **(1)**.
3. Select another line in the sketch **(2)**.



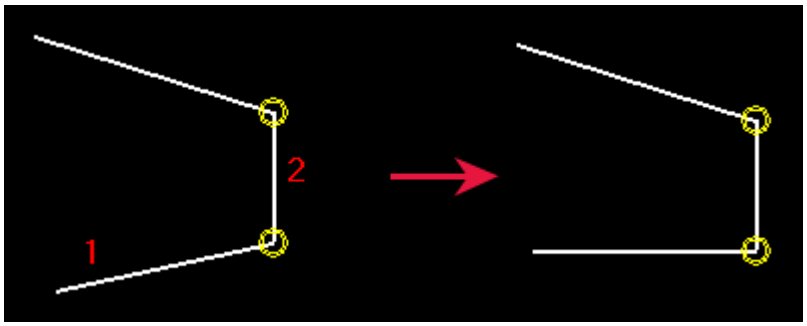
Add a perpendicular constraint

You can use a perpendicular constraint to force a line in a sketched profile to be at a 90 degree angle to another line that you select.

Before you begin, sketch the outline of the profile in the sketch editor. (page 267)

The selected lines do not have to intersect. You can add a perpendicular constraint to any two lines.

1. Click the **Perpendicular constraint** button:  .
2. Select a line in the sketch **(1)**.
3. Select another line in the sketch **(2)**.



Add a coincident constraint

You can use a coincident constraint to force two lines in a sketched profile to start or end at the same point, by extending or shortening one or both lines.

Before you begin, sketch the outline of the profile in the sketch editor. (page 267)

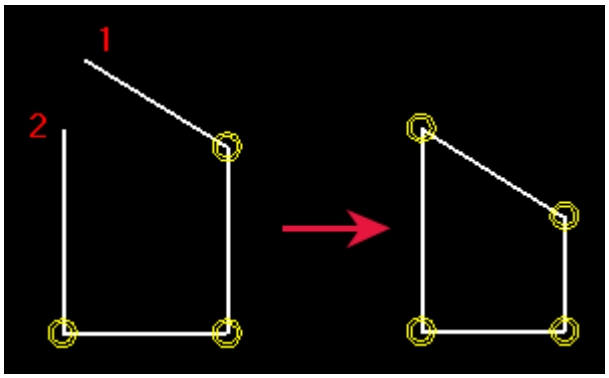
The selected lines do not have to intersect. You can add a coincident constraint to any two lines.

NOTE Tekla Structures automatically creates coincident constraints:

- where two lines meet
- between line segments when you draw them with the **Sketch polyline** tool
- between the start of the first line segment and the end of the last line segment in a shape, if they are within a certain distance of each other

---

1. Ensure that the **Snap to end points**  snap switch is active.
2. Click the **Coincident constraint** button:  .
3. Pick the end of the first line **(1)**.
4. Pick the end of the second line **(2)**.



Add a fixed constraint

You can use a fixed constraint to lock the position and angle of a line in a sketched profile so that other constraints do not affect it.

Before you begin, sketch the outline of the profile in the sketch editor. (page 267)

1. Click the **Fixed constraint** button:  .
2. Select a line in the sketch.

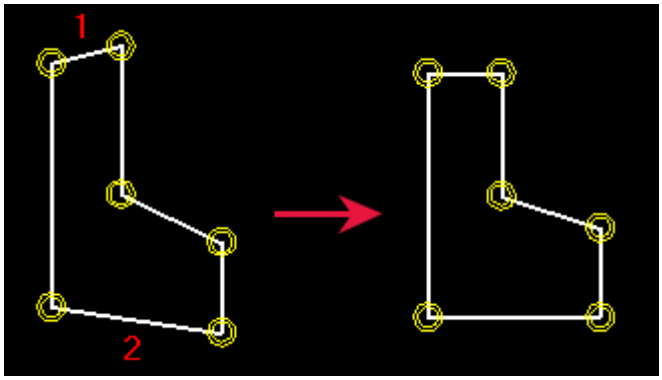
Add a horizontal constraint

You can use a horizontal constraint to force a line in a sketched profile to be parallel to the local x axis.

Before you begin, sketch the outline of the profile in the sketch editor. (page 267)

Tekla Structures automatically creates horizontal constraints when you create lines that are nearly horizontal.

1. Click the **Horizontal constraint** button:  .
2. Select the lines you want to straighten **(1, 2)**.



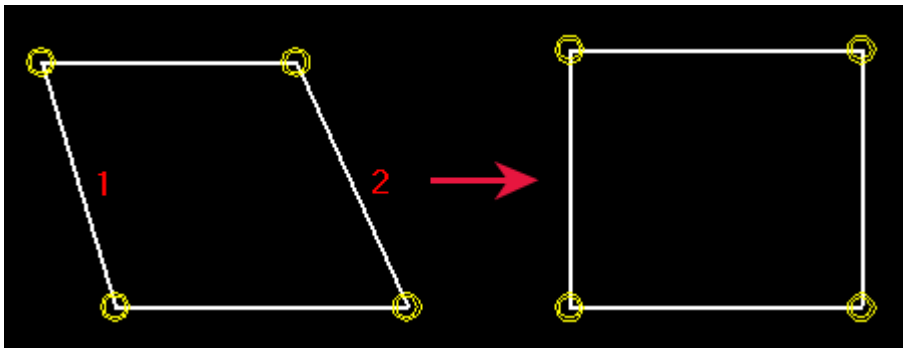
Add a vertical constraint

You can use a vertical constraint to force a line in a sketched profile to be parallel to the local y axis.

Before you begin, sketch the outline of the profile in the sketch editor. (page 267)

Tekla Structures automatically creates vertical constraints when you create lines that are nearly vertical.

1. Click the **Vertical constraint** button: 
2. Select the lines you want to straighten **(1, 2)**.



Delete a constraint

If a constraint is no longer needed, you can delete it from a sketched profile.

1. Click  to open the **Sketch Browser**.
2. Select the constraint that you want to delete.
3. Right-click and select **Delete**.
4. Click **Refresh**.

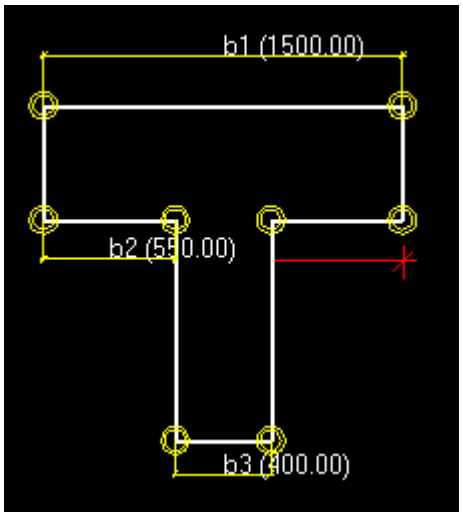
Add dimensions to a sketched profile

After you have sketched a profile, use dimensions to make different distances in the profile parametric. You can use these dimensions to define the size of the profile when you use it in a model.

Tekla Structures also adds the dimensions you create to the list of variables that you can use in calculations.

NOTE Do not create too many dimensions in a sketch. If there are too many dimensions, the dimensions cannot adjust when the values are changed.

In this example, if you create the dimension marked in red, the dimension b1 no longer works:

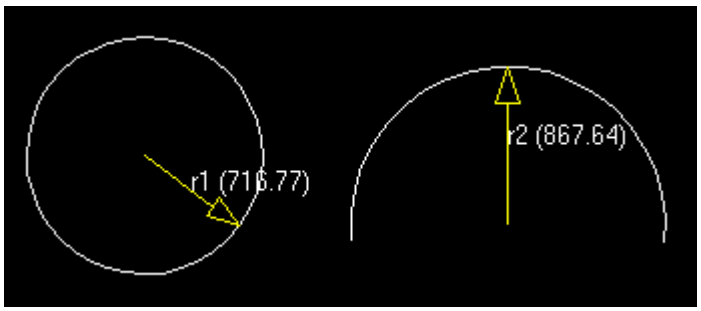


Add a radial dimension to a sketch

You can create a radial dimension for an arc or a circle in a sketched profile.

Before you begin, sketch the outline of the profile in the sketch editor. (page 267)

1. Click the **Sketch radial dimension** button:  .
2. Select the arc or circle.

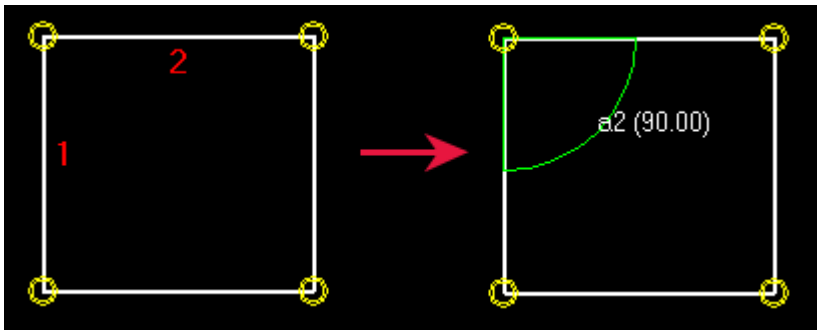


Add an angle dimension to a sketch

You can create an angle dimension between two lines in a sketched profile. The angle is calculated counter clockwise from the first line you select.

Before you begin, sketch the outline of the profile in the sketch editor. (page 267)

1. Click the **Sketch angle dimension** button:  .
2. Select the first line **(1)**.
3. Select the second line **(2)**.



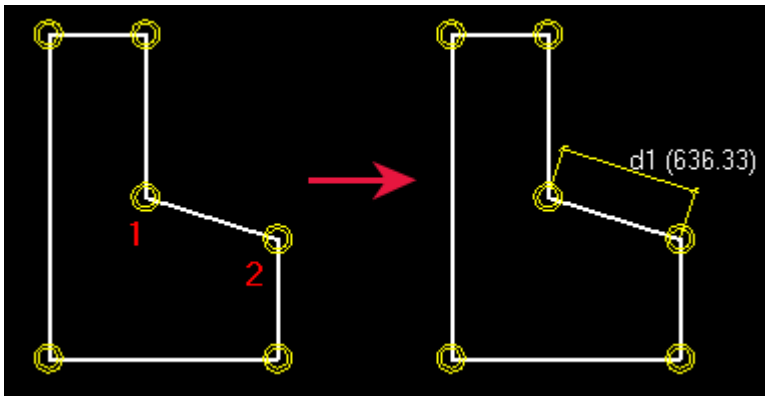
TIP If you are unable to see the angle symbol, scroll with the mouse wheel to zoom in.

Add a dimension between two points in a sketch

You can add a dimension to a sketched profile, between two points you pick.

Before you begin, sketch the outline of the profile in the sketch editor. (page 267)

1. Click the **Sketch free dimension** button: 
2. Pick a point to indicate the start point of the dimension **(1)**.
3. Pick a point to indicate the end point of the dimension **(2)**.
4. Pick a point to indicate the location of the dimension lines and text.



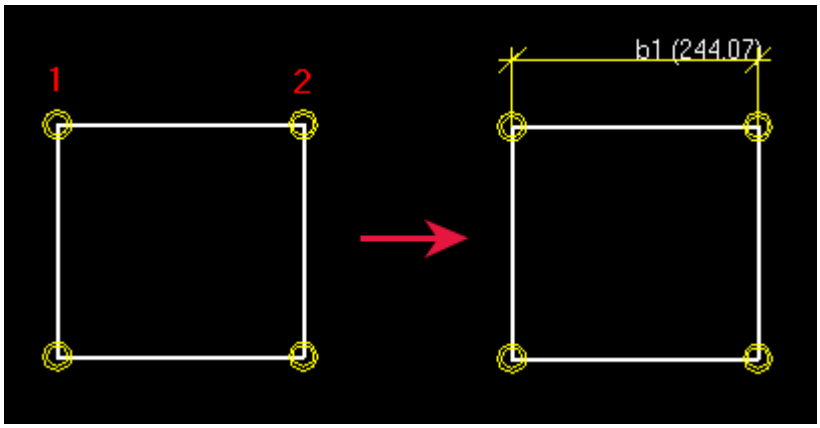
Add a horizontal dimension to a sketch

You can add a horizontal dimension to a sketched profile, between two points you pick.

Before you begin, sketch the outline of the profile in the sketch editor. (page 267)

1. Click the **Sketch horizontal dimension** button:  .
2. Pick a point to indicate the start point of the dimension **(1)**.

3. Pick a point to indicate the end point of the dimension **(2)**.
4. Pick a point to indicate the location of the dimension lines and text.

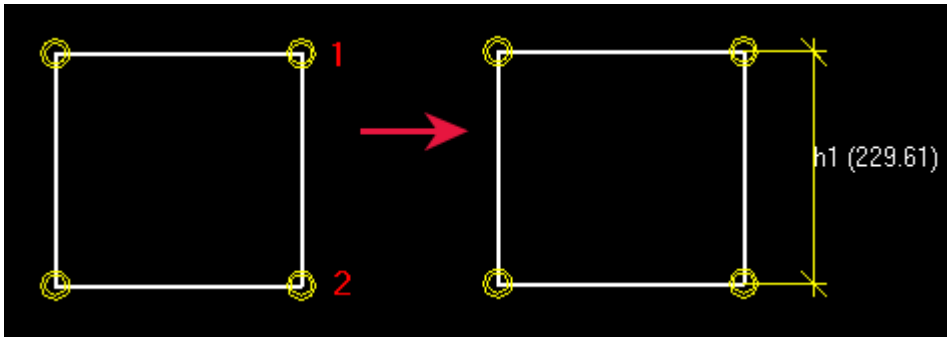


Add a vertical dimension to a sketch

You can add a vertical dimension to a sketched profile, between two points you pick.

Before you begin, sketch the outline of the profile in the sketch editor. (page 267)

1. Click the **Sketch vertical dimension** button:  .
2. Pick a point to indicate the start point of the dimension **(1)**.
3. Pick a point to indicate the end point of the dimension **(2)**.
4. Pick a point to indicate the location of the dimension lines and text.



Delete a dimension from a sketch

If a dimension is no longer needed in a sketch, you can delete it.

You can delete a dimension from a sketch in the sketch editor view, in the **Variables** dialog box, or in the **Sketch Browser**.

1. Select the dimension that you want to delete.
2. Do one of the following:

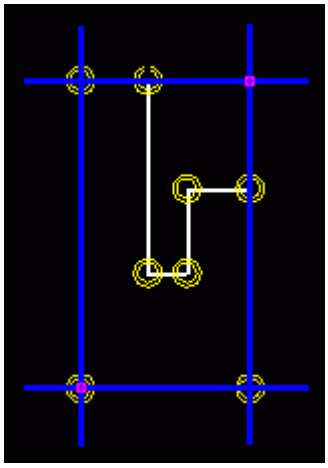
- In the sketch editor view or in the **Sketch Browser**, right-click and select **Delete**.
- In the **Variables** dialog box, click the **Delete** button.

Define positioning planes for a sketched profile
When you sketch a profile, you can define *positioning planes* for it. With positioning planes you can determine the planes that Tekla Structures uses for positioning parts and components.

Part positioning planes
With *part positioning planes* you can determine how Tekla Structures positions parts that have a sketched profile.

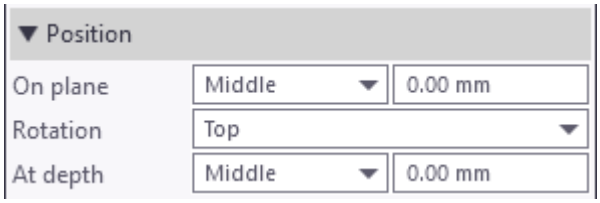
These planes are used for the **On plane** and **At depth** settings for parts, and also when placing custom components that are bound to boundary planes.

The part positioning planes are shown in blue:



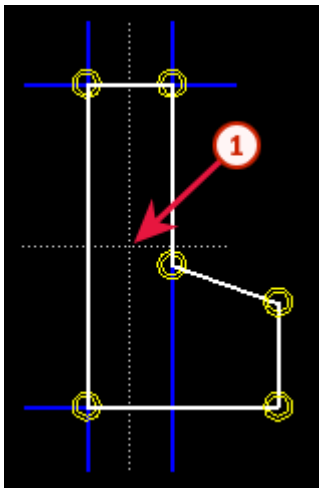
The **On plane** options **Left** and **Right** are set according to the vertical blue planes, and the **Middle** option is halfway between them.

For the **At depth** setting, the **Front** and **Behind** options are set according to the horizontal blue planes, and the **Middle** option is halfway between them.



Example

You can define part positioning planes so that an asymmetric profile is positioned according to its web only. In the following example, gray dotted lines illustrate the **Middle** option:

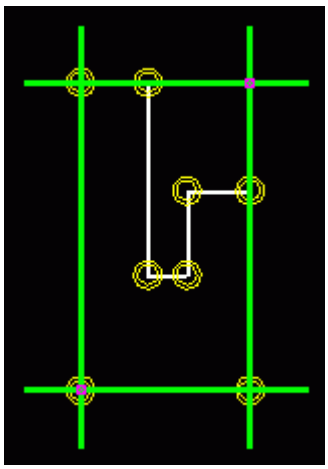


(1) Middle option

Connection positioning planes

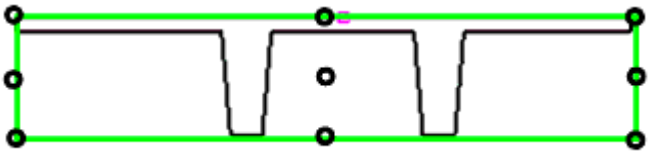
With *connection positioning planes*, you can determine how Tekla Structures positions components in relation to the component main part that has a sketched profile.

The connection positioning planes are shown in green:

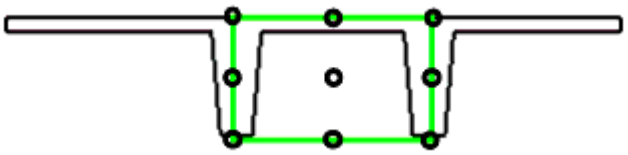


Example

This image shows the default connection positioning planes of a double tee slab that was created as a sketched profile. The green line illustrates the default connection positioning planes.



To place connections according to the location of the stems of the double tee, move the connection positioning planes as shown here.



Show and hide positioning planes

To show or hide the positioning planes, do one of the following:

To	Do this
Show or hide **part** positioning planes	Click  .
Show or hide **connection** positioning planes	Click  .

Move positioning planes

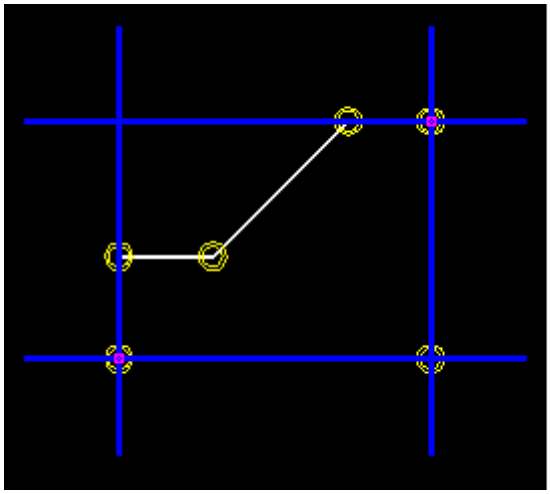
You can move the positioning planes by moving their handles.

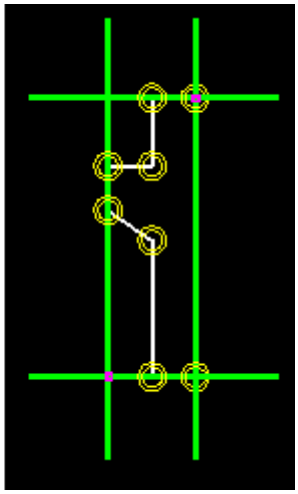
If you move the handles away from the outermost corners of the sketched profile, you must bind them by adding a dimension to each handle. Otherwise, the positioning does not function correctly in the model.

1. Click the positioning plane to show the handles.

   The handles are shown in pink. By default, the handles are at the outermost corners of the sketched profile.

   For example:





2. Click a handle to select it.

NOTE The same handle controls both the vertical and horizontal plane. You can move them both at the same time.

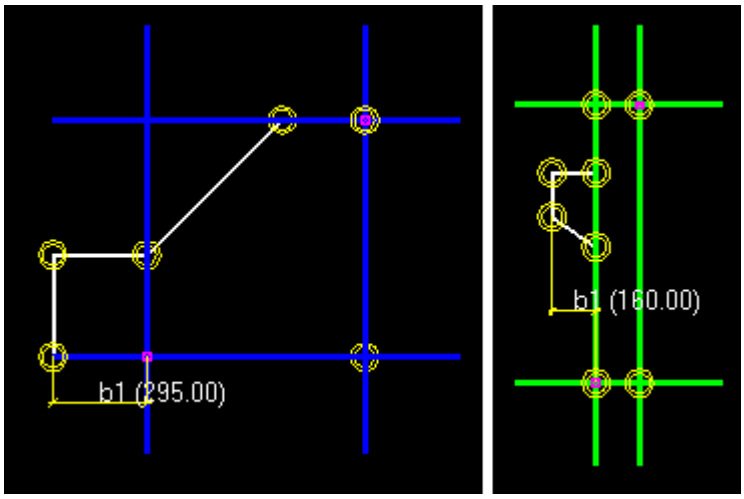
3. Move the handle like any other object in Tekla Structures.

   For example, right-click and select **Move**.

4. If the handle is not at the outermost corner of the profile, add a dimension between the handle and the corner.

Example

In this example, the left handle of the positioning plane has been bound by using a horizontal dimension **(b1)**:



Revert to default positioning planes

You can revert to the default positioning planes of a sketched profile if you have moved the planes.

To revert to the default positioning planes, do one of the following:

To	Do this
Revert to the default **part** positioning planes	1. Click  to show the part positioning planes. 2. Select the part positioning planes. 3. Right-click and select **Delete**. 4. Click  again to check that the planes have reverted back to the default.

To	Do this
Revert to the default **connection** positioning planes	1. Click  to show the connection positioning planes. 2. Select the connection positioning planes. 3. Right-click and select **Delete**. 4. Click  again to check that the planes have reverted back to the default.

Check a sketched profile
You can check that the constraints and dimensions in a sketched profile work correctly.

1. Double-click a dimension line to open the **Distance Properties** dialog box.
2. Change the **Value** box.
3. Click **Modify**.

   Tekla Structures updates the profile in the sketch editor.
4. Check that the shape of the profile does not change and that the dimensions adjust correctly.
5. Click **Cancel** to close the **Distance Properties** dialog box.

See also

Use sketched profiles in a model (page 283)

Save a sketched profile
Tekla Structures saves the sketched profiles in the current model folder, in the `xslib.db1` file, which is a library file containing custom components and sketches. Sketched profiles are available in the **Others** section in the profile catalog.

NOTE Note the following limitations when naming sketched profiles:

- You cannot use the name of a fixed profile.
- You cannot include numbers, special characters, or blank spaces in the profile name.
- Lower case letters are automatically converted into upper case letters.

To save a sketched profile, do one of the following:

To	Do this
Save a new profile	1. Click **Save sketch**  . 2. Enter a name in the **Prefix** box, and then click **OK**.
Update an existing profile	1. Click **Save sketch**  . 2. Click **Yes** when prompted to update the existing cross section.
Save a copy of the profile under a different name	1. Click **Save sketch as**  . 2. Enter a new name in the **Prefix** box, and then click **OK**.

Modify sketched profiles

You can modify existing sketched profiles, such as by modifying chamfers or dimensions. You can also move corners or holes by moving the handles. The chamfers are moved automatically when you move the handles.

Modify a sketched cross section

- You cannot change dimensions that have been calculated using formulas in the **Variables** dialog box.
- Constraints might also prevent you from changing dimensions.

1. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Modify Profile Catalog** dialog box.
2. Open the **Others** branch at the end of the profile tree.
3. To open the profile in the sketch editor, right-click a sketched profile, then select **Edit profile**.
4. Double-click a sketch object to modify its properties.

   The sketch objects that you can modify appear in yellow.
5. Modify the properties, then click **Modify**.
6. Close the sketch object properties dialog box.
7. Click the **Save sketch as** icon  to save the changes.

Modify chamfers in a sketch

You can change the shape and dimensions of chamfers in a sketched profile. For example, you can create rounded profile corners.

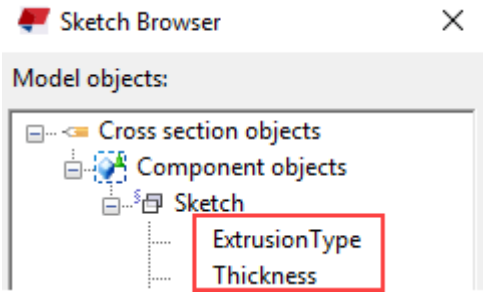
1. In the sketch editor, double-click a chamfer symbol .
2. In the **Chamfer Properties** dialog box, change the shape and dimensions of the chamfer.
3. Click **Modify**.
4. Click **OK** to close the dialog box.
5. Click the **Save sketch as** icon to save the changes.

Set the sketch thickness

If you have sketched an open shape, such as a cold-rolled section, you must define the thickness and extrusion type of the sketch in the **Sketch Browser**.

Before you begin, sketch an open polyline (page 267) in the sketch editor.

The sketch thickness can be fixed or parametric.



1. Set the sketch thickness in one of the following ways:
   - To set a fixed thickness:
     a. In the **Sketch Browser**, right-click **Thickness**, then select **Add Equation**.
     b. Enter the value of the thickness after =.
   - To define a parametric thickness:
     a. In the **Variables** dialog box, add a new parameter variable (for example, P1) for **Length**.
     b. In the **Formula** column, define the default value for the parameter variable.
     c. In the **Sketch Browser**, right-click **Thickness**, then select **Add Equation**.
     d. Enter the name of the parameter variable (for example, P1) after =.
2. To define the extrusion type:
   a. In the **Sketch Browser**, right-click **ExtrusionType**, then select **Add Equation**.

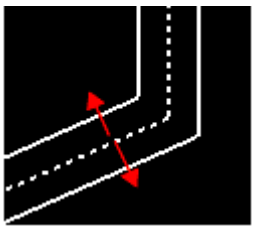
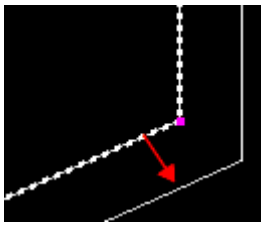
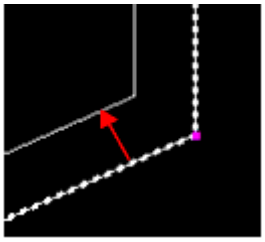
b. Enter the extrusion type number (0, 1, or 2) after =.

3. Click the **Save sketch as** icon  to save the changes.

Extrusion types

The extrusion type defines how a sketched profile of a consistent thickness is extruded. You must define the extrusion type for sketches that consist of an open polyline.

When you change the thickness, the profile grows inwards, outwards, or symmetrically in both directions, depending on the extrusion type.

Type	Description	Image
0	The sketch is extruded symmetrically to the outside and inside of the polyline. (Default)	
1	The sketch is extruded to the outside of the polyline.	
2	The sketch is extruded to the inside of the polyline.	

Use sketched profiles in a model

After you have created a sketched profile and saved it, you are ready to use it in the model. If you have applied constraints correctly, the shape of the profile is maintained when you change its dimensions.

1. In the property pane, open the part properties.

   For example, to open the beam properties, on the **Steel** tab, hold down **Shift**, then click  .

2. Click the **...** button next to the **Profile** field.

   The **Select Profile** dialog box appears.

3. Open the **Others** branch at the end of the profile tree.
4. Select a sketched profile.
5. If the profile is parametric, define its dimensions in the **Value** column on the **General** tab.
6. Click **OK** to close the **Select Profile** dialog box.
7. Pick points to place the part in the model.

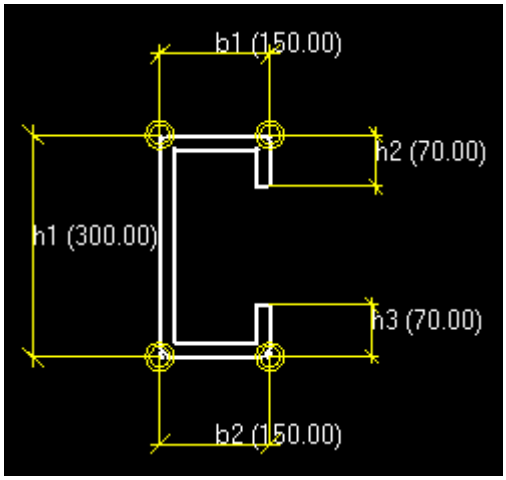
See also

Create an image of a profile (page 292)

Example: Create a symmetric C-shaped profile by sketching
This example shows how to create a sketched profile using variables.

After completing the tasks, you will have a symmetric C-shaped profile with the dimensions b1 = b2 and h2 = h3. When you use the profile in the model, you can change the following dimensions:

- Width (b1)
- Total height (h1)
- Height (h2)
- Thickness (P1)
- Chamfers (P2)

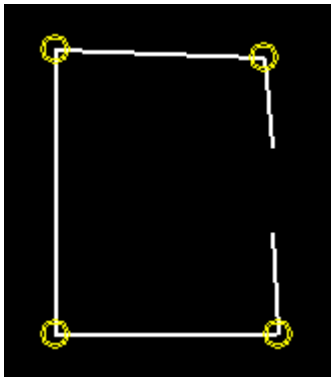


Example: Sketch a C-shaped profile

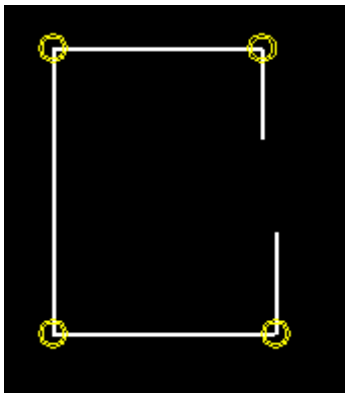
Start by sketching the outline of the profile.

1. Open the sketch editor.
2. Use the **Sketch polyline** command to create a rough C-shaped profile.

At this stage, the profile does not have to be symmetric or have the right dimensions.



3. Straighten the lines using the **Add horizontal constraint** and **Add vertical constraint** commands.

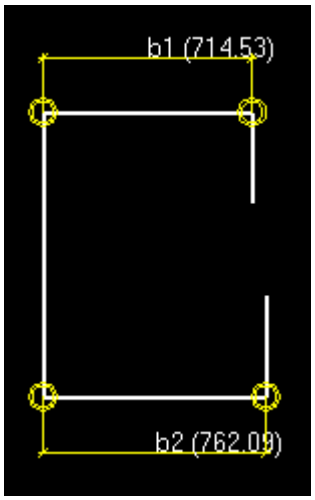


4. Save the profile and name it `CSHAPE`.

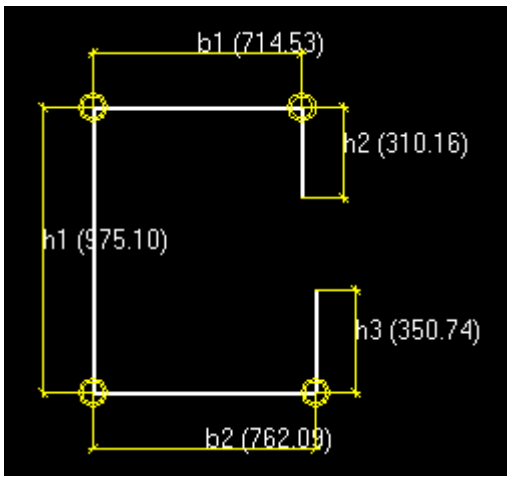
Example: Add dimensions to the sketched profile

After sketching the outline of the profile, you can continue by adding dimensions.

1. Use the **Sketch horizontal dimension** command to create the distances b1 and b2.



2. Use the **Sketch vertical dimension** command to create the distances h1, h2, and h3.



3. In the **Variables** dialog box, enter the following values for the distances:

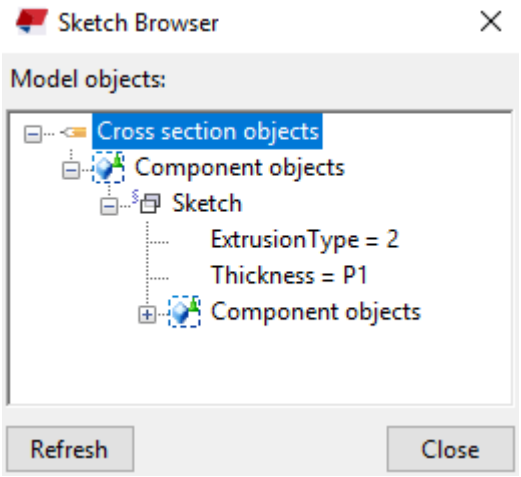
Name	Formula	Value	Value type	Variable type	Visibility	Label in dialog box
b1	**150.00**	**150.00**	**Length**	**Distance**	**Show**	**Width**
b2	**=b1**	**150.00**	**Length**	**Distance**	**Hide**	**Width**
h1	**300.00**	**300.00**	**Length**	**Distance**	**Show**	**Height**
h2	**70.00**	**70.00**	**Length**	**Distance**	**Show**	**Height**
h3	**=h2**	**70.00**	**Length**	**Distance**	**Hide**	**Height**

4. Ensure that **Visibility** is set to **Show** for the distances b1, h1, and h2.
5. Save the sketched profile.

Example: Set the sketch thickness

After adding dimensions to the sketched profile, you can continue by defining the thickness of the sketch.

1. In the **Variables** dialog box, do the following:
   a. Click **Add** to add a parameter variable P1.
   b. In the **Formula** column, enter `20.00`.
   c. In the **Visibility** column, select **Show**.
   d. In the **Label in dialog box** column, enter `Thickness`.
2. In the **Sketch Browser**, set the thickness using the parameter variable P1.
   a. Right-click **Thickness**, select **Add Equation**, and then enter `=P1`.
   b. Right-click **ExtrusionType**, select **Add Equation**, and then enter `=2` to get the sketch extruded to the inside of the polyline.



3. Save the sketched profile.

Example: Modify the chamfers of the sketched profile

After setting the thickness of the sketch, you can continue by modifying the chamfers of the sketched profile.

1. In the sketch editor, do the following:
   a. Double-click a chamfer symbol .
   b. In the **Chamfer properties** dialog box, change the chamfer type to **Line** , and then click **Modify**.
   c. Repeat steps 1a–b for all the chamfers.
2. In the **Variables** dialog box, do the following:
   a. Click **Add** to add a parameter variable P2.

b. In the **Formula** box, enter `10.00`.

c. In the **Visibility** box, select **Show**.

d. In the **Label in dialog box** box, enter `Chamfer`.

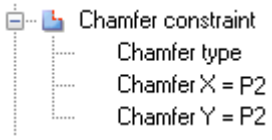
3. In the **Sketch Browser**, do the following:

   a. Double-click **Chamfer constraint** to open the chamfer properties.

   b. Right-click **Chamfer X**, select **Add Equation**, and then enter `=P2`.

   c. Enter the same value for **Chamfer Y**.

   d. Repeat steps 4a–c for all the chamfers.



4. Save the sketched profile.

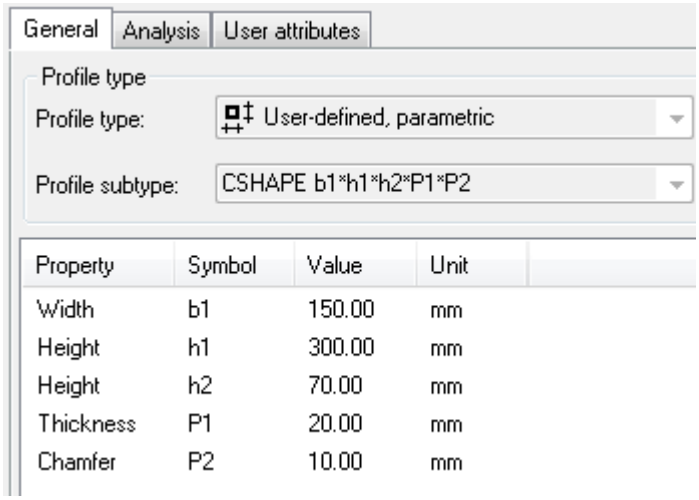
Example: Use the sketched profile in a model

Your sketched profile is now completed and you can use it in a model.

1. Double-click a part to open the part properties in the property pane.
2. Click the **...** button next to the **Profile** box.

   The **Select Profile** dialog box appears.

3. Open the **Others** branch at the end of the profile tree, and select the **CSHAPE** profile.
4. If needed, modify the dimensions of the profile on the **General** tab.

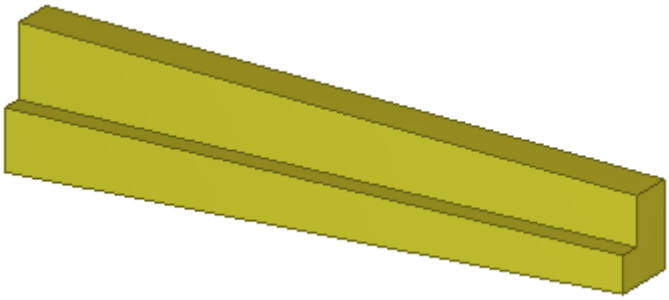


5. Click **OK** to apply the changes.
6. Pick points to place the part in the model.

Create parametric profiles with variable cross sections
You can create parametric user-defined profiles with variable cross sections using the **Profile Editor**. You can use a profile with variable cross sections like any other parametric profile.

You can

- use a cross section with different dimensions at different locations in a profile
- modify the variables of the cross sections and the profile
- save the profile and use it as a parametric profile through the profile catalog
- import and export variable cross section profiles



NOTE When you use this method, only the dimensions of a variable cross section can vary, not the actual shape of the cross section. If you want to use several different cross section shapes in the profile, create a fixed profile (page 253) with multiple cross sections instead.

Create a profile with variable cross sections

Before you start:

- Create a sketched profile (page 264) using the sketch editor.

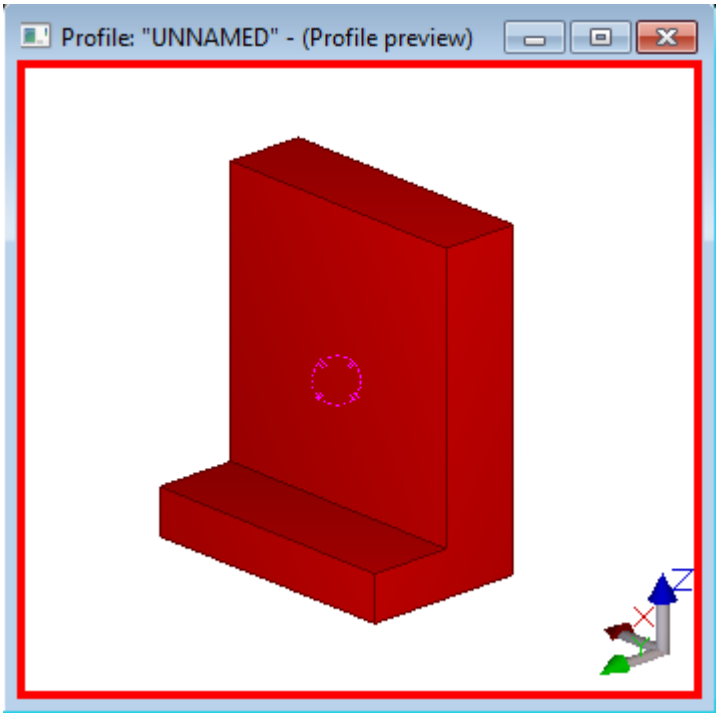
- In the **Variables** dialog box in the sketch editor, set **Visibility** to **Show** for the dimensions that you want to change when using the profile in a model.

1. On the **File menu**, click **Catalogs** --> **Define properties** --> **Define profile with variable cross section**.

   The **Define Profile with Variable Cross Section** dialog box opens.

2. Select the sketch you want to use as the start and end cross section of the profile.
3. Click **OK**.

   The **Profile Editor** and the **Profile preview** view appear.



4. Under **Cross sections of the profile**, add cross sections or remove selected cross sections by clicking **Add** or **Remove**.

   When you click **Add**, Tekla Structures adds a new cross section at the end of the profile, at the location 1.0., and moves the existing cross sections towards the start of the profile. By default, cross sections are located at 0.1 intervals in the profile.

5. Under **Cross section variables**, define the following:

   - The relative location of each cross section in the profile.

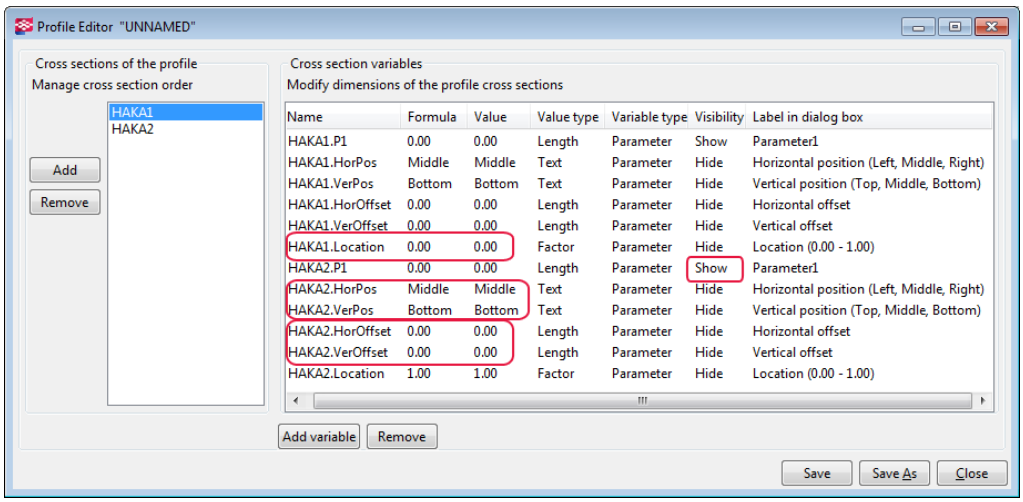
     Use the `*.Location` variables. For example, start=0.00, middle=0.5, end=1.00.

   - How the cross sections are aligned in the horizontal and vertical direction.

     Use the `*.HorPos` and `*.VerPos` variables.

- How much the cross sections are offset from the alignment.

  Use the `*.HorOffset` and `*.VerOffset` variables.



6. If you have added new cross sections, check that they do not overlap any existing cross sections.
7. Set **Visibility** to **Show** for the dimensions that you want to change when using the profile in a model.
8. If you want to use parameter variables and equations to define the cross section dimension, click **Add variable** and define the variable values.
9. Save the profile.
   a. Click **Save**.
   b. In the **Save profile as** dialog box, enter a unique name for the profile.

      You cannot include numbers in the profile name, or use the name of a standard profile.
   c. Click **OK**.

      Tekla Structures saves the profile in the current model folder.

Modify a profile with variable cross sections

1. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Modify Profile Catalog** dialog box.
2. Open the **Others** branch at the end of the profile tree.
3. Right-click a profile with variable cross sections, and then select **Edit profile** to open the profile in the **Profile Editor**.
4. Modify the profile properties.
5. Click **Save**.

Define standardized values for parametric profiles

You can define standardized values for the dimensions of parametric profiles. The standardized values are visible in the profile catalog where you can select suitable dimension values for the profiles.

1. Under `..\ProgramData\Trimble\Tekla Structures\<version>\environments\<environment>` folder, locate the `industry_standard_profiles.inp` file.

   The exact file location may vary depending on the folder structure of your environment files.

   If there is no `industry_standard_profiles.inp` file in your environment, you can use the file of the default environment.

2. Copy the `industry_standard_profiles.inp` file and place it in your firm, project, or model folder.

3. Open the copied `industry_standard_profiles.inp` file using any standard text editor, for example, Microsoft Notepad.

4. Modify the file.

   The file has the following format:

   - profile and profile subtype
   - parameters separated by spaces
   - units for each parameter
   - standardized values for each parameter.

     Each dimension combination has its own row.

5. Save the file.

Example

For example, the standardized combinations of dimension values for a C profile are as follows:

```
c h*b*t
h    b    t
mm       mm       mm
75       35       5
75       35       6
75       35       7
100      40       7
100      40       8
100      40       9
```

Create an image of a profile

To illustrate the shape and dimensions of a profile you have created, you can create an image of it. Tekla Structures shows the image when you browse for profiles in the profile catalog.

The image must be in Windows bitmap (`.bmp`) format and can be created with any bitmap editor, such as Microsoft Paint.

1. Take a screenshot of the profile that you have drawn or sketched.

   For example, press the **Print Screen** (**Prt Scr**) key to take a screenshot of your entire desktop. To take a screenshot of an active window, press **Alt +Print Screen**. The screenshot is placed on the clipboard.

2. Open the screenshot in a bitmap editor and modify the image if necessary.

3. Save the image in `.bmp` format in the `..\ProgramData\Trimble\Tekla Structures\<version>\Bitmaps` folder.

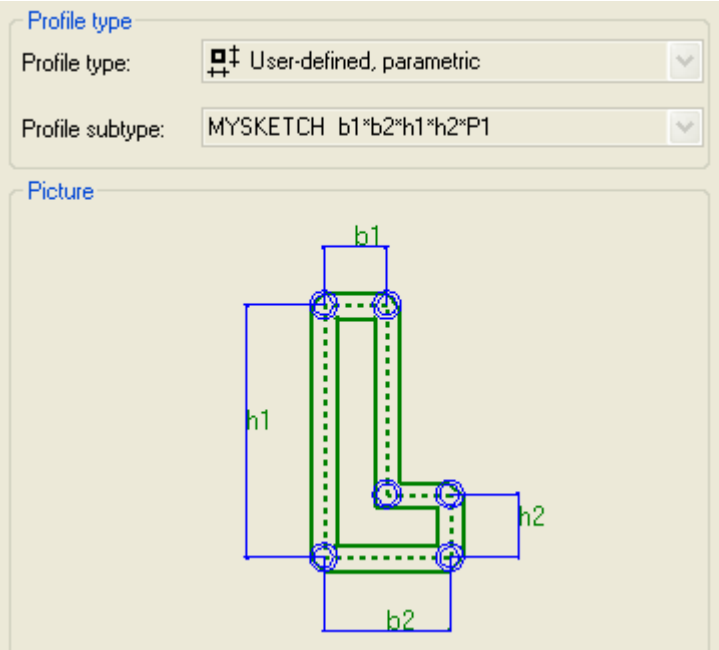
   The file name must match the profile name. For example, if the name of a fixed profile (page 253) or a sketched profile (page 264) is `mysketch`, the image must be named `mysketch.bmp`.

   If the profile has been created using a .clb file (page 256), the name of the image file must also include the library ID that has been used for the profile in the `.clb` file and in the `profitab.inp` file. For example, if the library ID is `BuiltUps` and the cross section name is `BOXISMC`, name the image file `BuiltUps.BOXISMC.bmp`.

   Note that the profile names, cross section names, and library IDs are case sensitive.

4. Restart Tekla Structures.

The image is now shown in the profile catalog.



Customize the shape catalog

The shape catalog contains information about shapes that are used for defining items. Use the **Shape catalog** dialog box to view and modify shape properties and metadata, to group and tag shapes, and to import and export shapes.

The shape catalog includes default shapes, for example **Default** and **Concrete_Default**, and other shapes that are read from specific shape folders in a set folder search order (page 45). The shapes that you import, download from Tekla Warehouse, or create using existing geometry (page 295) in the currently open model are also shown in the shape catalog.

Shape definition files

For each shape in the shape catalog, there are two *definition files* that contain the shape information:

- One `.xml` file for shape attributes, such as name and GUID, stored in the `\Shapes` folder
- One `.tez` or `.xml` file for geometric properties, such as coordinates, stored in the `\ShapeGeometries` folder

Tekla Structures searches for these subfolders and definition files in the model, project, firm, and system folders, and in the folder defined by the advanced option XS_DEFAULT_BREP_PATH.

The definition files of the shapes that are used for items in a model are automatically copied to the model folder.

If you have shapes that you would like to have available in the shape catalog for all new models that are created in your project or company, copy the corresponding `.xml` and `.tez` files to the correct subfolders (`\Shapes` and `\ShapeGeometries`) in the `\profil` folder under your project or firm folder (page 16).

Group structure and other shape files

The hierarchical *group structure* of the shape catalog is read from the `ShapeCatalog.Groups.xml` file in the model folder. Using this file, you can share the group structure with all users in a project, preferably in the beginning of the project.

If you modify the group structure, Tekla Structures saves the changes to the `ShapeCatalog.Groups.user.<username>.xml` file in the model folder.

The `*.shapecatalog` and `*.ShapeCatalog.Groups.xml` files are used for exporting and importing shapes and the group structure between Tekla Structures models.

Create shapes

In addition to importing item shapes or downloading them from Tekla Warehouse, you can create shapes using existing geometry and parts in Tekla Structures models.

For example, you can create a shape using a single part or several parts that have been attached to each other.

The part reference point that has the yellow handle determines the origin of the shape. The positive global x direction determines the direction of the shape. When you create items using the shape, the shape origin and direction align with the yellow and magenta item handles.

The shape name is generated using the part name and part location in the format <grid location>_<elevation>_<part name>. For example:

- 1/D_+0_FOOTING
- 3/C_+0-+3600_COLUMN
- 1-2/A-B_+3600_SLAB

If there is already a shape with the same name in the shape catalog, Tekla Structures adds two underscore characters and a running number at the end of the new shape name. For example, 1/D_+0_FOOTING__1.

Create a shape by using existing geometry in the model

Use this method if you want to create a new shape using an existing part, but you do not want to delete the part or change it to an item.

1. Using parts, model the geometry from which you want to create a shape.
2. If you want to include more than one part in the shape, attach the parts to each other.
3. On the **Edit** tab, click  **Create shape from geometry**.
4. Select the part.

   Alternatively, you can first select the part, right-click, and then select **Create shape from geometry**.

Tekla Structures adds a new shape to the shape catalog (page 294).

You can then use the shape when you create items in the model. You can also modify items and shapes further in the **Geometry editing** mode.

Create a shape by converting a part to an item

When you change an existing part in the model to an item, Tekla Structures also creates a new shape and adds it to the shape catalog.

When you change a part to an item, Tekla Structures deletes the original part and replaces it with the newly created item in the model. The name, material, finish, class, pour phase, and the numbering properties of the original part are saved as the corresponding item properties. Other part type specific properties and user-defined attributes are not saved. The objects that are attached to the original part, such as reinforcement and surfaces, are deleted.

1. Create the parts that you want to change to an item.
2. If you want to include more than one part in the item, attach the parts to each other.
3. On the **Edit** tab, click  **Convert part to item**.
4. Select the part.

   Alternatively, you can first select the part, right-click, and then select **Convert part to item**.

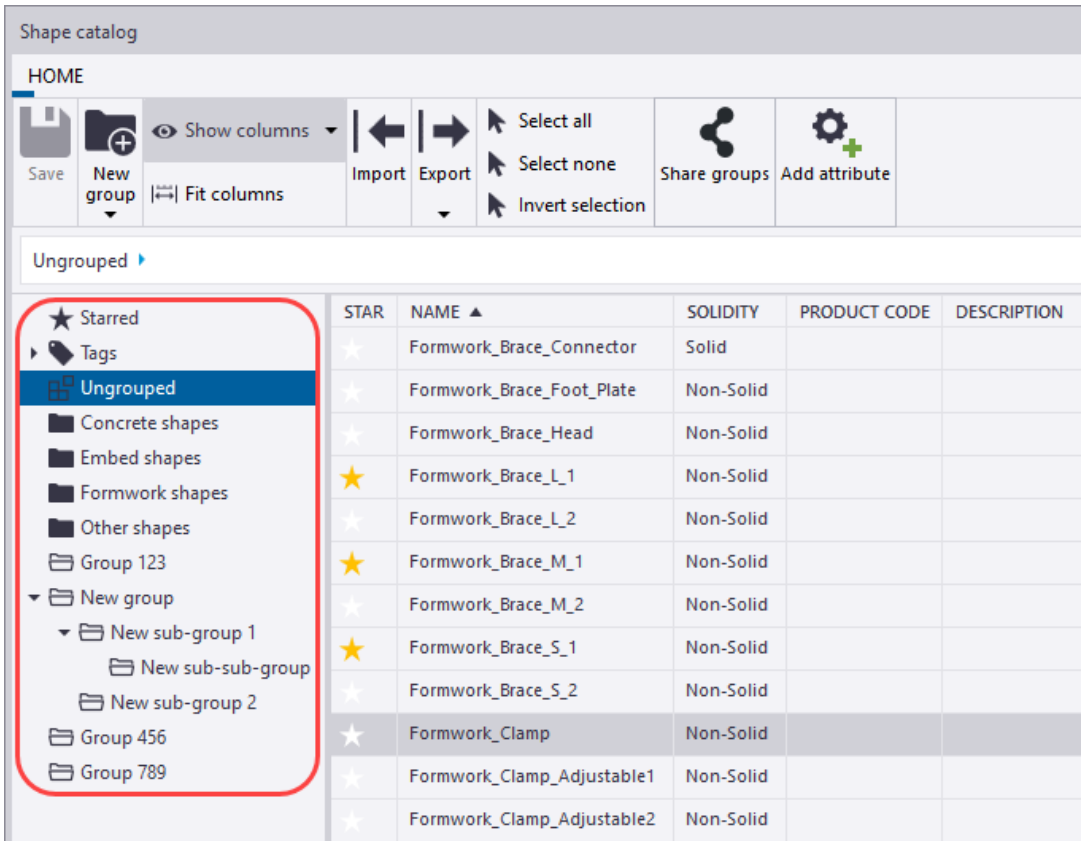
Tekla Structures changes the part to an item and adds a new shape to the shape catalog (page 294).

Organize shapes and groups in the shape catalog

You can arrange the shapes in the shape catalog in a hierarchical group structure.

The group structure is shown on the left side of the **Shape catalog** and **Select shape** dialog boxes. In the **Shape catalog** dialog box, you can add, modify,

and delete groups and sub-groups, and move and copy shapes between the groups and sub-groups.



The group structure might vary depending on the Tekla Structures environment that you are using. Alternatively, your company or project administrator might have created and shared a group structure. If you are a Tekla Structures administrator or main user, you can share your groups so that they become available to all users in the shared model.

The group structure is read from the `ShapeCatalog.Groups.xml` file in the model folder and from the `*.ShapeCatalog.Groups.xml` files in the shape sub-folders in the project, firm, and system (XS_SYSTEM) folders. Some shapes might first be in the **Ungrouped** group, but you can regroup them.

New shapes that you create (page 295) in the model are also added to the **Ungrouped** group. If you import new shapes without a group structure, you can select a group for the shapes. You can also group shapes by tagging or starring (page 304) them.

Groups that are marked with are system groups. Groups that are marked with are user-defined groups.

Current user-defined groups and the changes that you make to the group structure are stored in the `ShapeCatalog.Groups.user.<username>.xml` file in the model folder.

NOTE Even if you modify the group structure, the definition files (`.xml` and `.tez`) for each shape remain in the original `\Shapes` and `\ShapeGeometries` folders.

The **Select shape** dialog box is used for selecting a shape for an item. In the **Select shape** dialog box, the **Recent** group is also shown. It contains the latest shapes that you have used.

Add a new group or sub-group

1. On the **File** menu, click **Catalogs** --> **Shape catalog** to open the **Shape catalog** dialog box.
2. To add a sub-group to an existing group, select the group on the left side of the dialog box.

   You can add sub-groups to both user-defined groups and system groups, but not to the **Starred**, **Tags**, or **Ungrouped** group.

3. Click **New group** and do one of the following:
   - To create a highest-level group, select **New group**.
   - To add a sub-group under the selected group, select **New sub-group**.
4. In the **New group name** dialog box, enter a name for the new group, then click **Create**.
5. Add, move, or copy shapes to the new group, or modify the shape properties as needed.
6. Click **Save** to save the changes to the shape catalog.

Modify a group or sub-group

You can rename groups and sub-groups, and modify group properties.

1. On the **File** menu, click **Catalogs** --> **Shape catalog** to open the **Shape catalog** dialog box.
2. Select the group or sub-group that you want to modify.
3. To rename the group, do the following:
   a. Right-click and select **Rename**.
   b. In the **Rename group** dialog box, enter the new name, then click **Rename**.
4. To modify group properties, such as the manufacturer or tags (page 307) of the shapes in the group, do the following:
   a. Select all shapes in the group.

b. In the property area on the right side of the **Shape catalog** dialog box, modify the properties.

5. Click  **Save** to save the changes to the shape catalog.

Move or copy a group or sub-group

You can move and copy groups and sub-groups in the shape catalog. You can move and copy both user-defined groups and system groups.

When you move or copy a group, the sub-groups of the selected group are also moved or copied.

You cannot move or copy the **Starred**, **Tags**, or **Ungrouped** group, or sub-groups in them.

1. On the **File** menu, click **Catalogs** --> **Shape catalog** to open the **Shape catalog** dialog box.
2. Select the group or sub-group that you want to move or copy.
3. Do one of the following:
   - To move the group, drag the group to a new location in the group structure.
   - To move a sub-group to the highest level in the group structure, right-click the sub-group and select **Move to top level**.
   - To copy the group, hold down **Ctrl** and drag the group to a new location.
   - To copy a sub-group to the highest level, right-click the sub-group and select **Copy to top level**.
4. Click  **Save** to save the changes to the shape catalog.

Select shapes

You can use these methods when you select shapes in the **Shape catalog** dialog box.

Selecting different sets of shapes is useful when you want to export (page 311) or add tags (page 307) to certain shapes, or otherwise modify a sub-set of shapes.

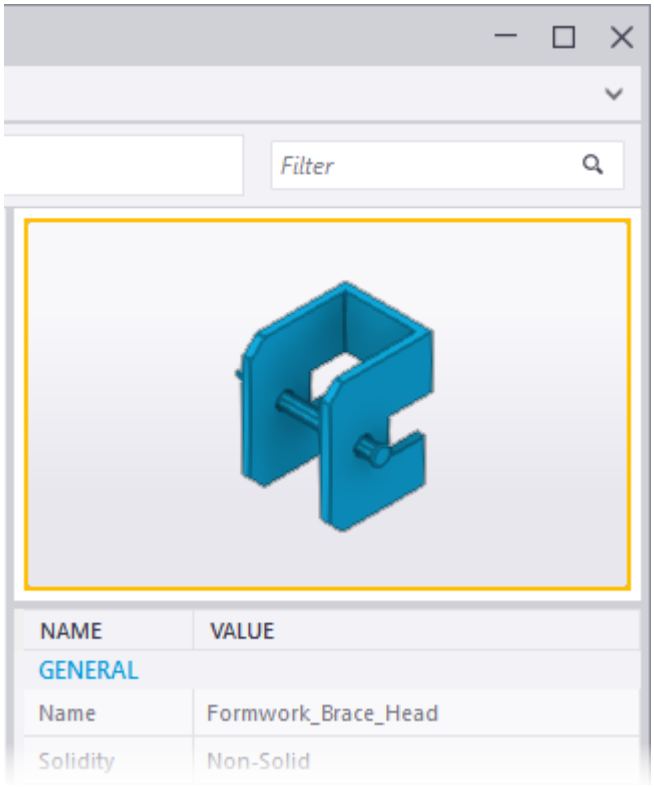
- Use the following commands on the catalog ribbon:
  - Click **Select all** to select all the shapes in the currently visible group.

    Alternatively, you can select one shape, then press **Ctrl+A**.
  - Click **Select none** to clear the current selection.
  - Click **Invert selection** to select the currently unselected shapes and to deselect the currently selected shapes.

- To select several consecutive shapes, select the first shape, then hold down **Shift** and select the last shape.
- To select several non-consecutive shapes, select the first shape, then hold down **Ctrl** and select the other shapes.

Preview a shape
In the **Shape catalog** and **Select shape** dialog boxes, Tekla Structures shows a preview of the selected shape in the upper right corner of the dialog box.

Use these methods to examine the shape in the preview:



- Zoom in and out by scrolling with the mouse wheel
- Rotate the shape using the left mouse button ( )
- Pan using the middle mouse button ( )
- Adjust the viewing angle using the right mouse button ( )

Move or copy shapes between groups

When you move a shape from one group to another, shapes are removed from the previous group. When you copy a shape between groups, the shapes remain in both groups.

1. On the **File** menu, click **Catalogs** --> **Shape catalog** to open the **Shape catalog** dialog box.
2. Browse to and select the group from which you want to move or copy shapes.
3. Do one of the following:
   - To move one or more shapes to another group, select the shapes and drag them to the other group.

     Alternatively you can right-click the selected shapes, select **Move to group**, and then, in the dialog box that appears, select a group. In the dialog box, you can also create a new group or sub-group for the shapes, if needed.
   - To copy one or more shapes to another group, select the shapes, hold down **Ctrl**, then drag the shapes to the other group.

     Alternatively you can right-click the selected shapes, select **Copy to group**, and then, in the dialog box that appears, select a group. In the dialog box, you can also create a new group or sub-group for the shapes, if needed.
   - To remove one or more shapes from the selected group, select the shapes, right-click on one of the selected shapes, and then select **Remove from group**.

     If the shapes only belong to the selected group, the shapes are moved to the **Ungrouped** group. If the shapes also belong to any other group, they remain in that group.
4. Click  **Save** to save the changes to the shape catalog.

Modify shape properties

1. On the **File** menu, click **Catalogs** --> **Shape catalog** to open the **Shape catalog** dialog box.
2. Browse to and select the group in which you want to modify shape properties.
3. Select one or more shapes.
4. In the property area on the right side of the **Shape catalog** dialog box, modify the shape properties.

For example, you can add a description or tags (page 307) to the selected shapes.

NOTE You cannot rename shapes. You cannot remove or change the solidity information, Tekla Structures version, source file location, or GUIDs of the shapes.

5. Click  **Save** to save the changes to the shape catalog.

Add a new user-defined attribute to shapes

In addition to the shape properties that are shown by default in the shape catalog, you can add user-defined attributes to the selected shapes.

User-defined shape attributes are saved in each selected shape's definition file (`.xml`) in the `\Shapes` folder in the model folder.

User-defined attributes of shapes cannot be shown in reports.

1. On the **File** menu, click **Catalogs** --> **Shape catalog** to open the **Shape catalog** dialog box.
2. Select the shapes to which you want to add a new attribute.
3. Click  **Add attribute**.
4. In the **Define attribute** dialog box, do the following:
   a. In the **Label** box, define a name for the attribute.
   b. In the **Type** list, select the type of information that the attribute contains.
   c. In the **Description** box, enter any additional information about the attribute.
   d. Click **Add attribute**.

   Tekla Structures shows the new attribute at the end of the property list in the **Shape catalog** dialog box and in the **Select shape** dialog box, before the tags.
5. In the property list, enter a value for the new attribute in the **Value** cell, then press **Enter**.
6. If you need to modify a user-defined attribute, do the following:
   a. Select the attribute in the property list.
   b. Click  next to the name of the attribute.
   c. In the **Modify attribute** dialog box, modify the type or description of the attribute, and then click **Modify attribute**.

You cannot modify the name of the attribute.

The modifications are applied to all shapes that have this attribute when you click **Yes** to confirm the modifications.

7. If you need to delete a user-defined attribute, do the following:
   a. Select the attribute in the property list.
   b. Click  next to the name of the attribute.
   c. If you want to delete the attribute from certain shapes only, select the shapes.
   d. Select whether you want to delete the attribute from the selected shapes only, or from all shapes that have the attribute. Click **Delete from selected** or **Delete from all** accordingly.
8. Click  **Save** to save the changes to the shape catalog.

Delete a group or sub-group, or shapes

You can delete groups, sub-groups, and shapes within the groups from the shape catalog. You can delete both the groups and the shapes in the groups at the same time, or you can delete groups and shapes separately.

Before you delete shapes, ensure that any shape that you want to delete is not used for items in your Tekla Structures model. When you delete a shape from the shape catalog, the shape is no longer available anywhere in the model.

If you try to delete shapes that are used for items in the model or whose definition files are not in the model folder, Tekla Structures does not delete those shapes.

1. On the **File** menu, click **Catalogs** --> **Shape catalog** to open the **Shape catalog** dialog box.
2. Select a group or sub-group on the left side of the dialog box.
3. Do one of the following:
   - To only delete the group but not the shapes in it, right-click the group, then select **Delete**.

     If the shapes only belong to the deleted group, the shapes are moved to the **Ungrouped** group. If the shapes also belong to any other group, they remain in that group.
   - To delete both the group and the shapes in it, right-click on the group and select **Delete with shapes**.
   - To only delete certain shapes in the group, select one or more unused model-folder shapes, right-click on one of the shapes, and then select **Delete**.

   You are prompted to confirm the deletion.

4. Click **Yes**.
5. Click  **Save** to save the changes to the shape catalog.

Share groups with other users
If you are a Tekla Structures administrator or main user, you might have organized shapes into groups in a project. You can then share the group structure so that your user-defined groups become system groups and are available to all users in the shared model.

1. On the **File** menu, click **Catalogs** --> **Shape catalog** to open the **Shape catalog** dialog box.
2. If still needed, modify the group structure and shape properties, then click  **Save** to save the changes to the shape catalog.
3. Click  **Share groups**.
4. When prompted to confirm the sharing, click **Share groups** in the dialog box that appears.
5. Click **OK**.

The other users in the shared model will see the shared groups when the users read in changes the next time.

Organize the shape catalog view
You can organize the shape catalog view to suit your needs and ways of working.

In the **Shape catalog** dialog box, you can show or hide property columns, or change the order of the property columns. You can also filter shapes and mark them with stars and tags.

In the **Select shape** dialog box, you can show or hide property columns, or change the order of the property columns. You can also filter shapes and mark them with stars.

The **Select shape** dialog box opens when you click the **...** button next to the **Shape** box in the item properties, or in a component dialog box.

The changes that you make to the dialog box layout are automatically saved to the `shape_catalog.settings.UI` file in the `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\Catalogs\` folder. Tekla Structures uses the saved layout next time you open the dialog box.

Show or hide the catalog ribbon

You can show or hide the catalog ribbon in catalog dialog boxes and selection dialog boxes.

You can show or hide the catalog ribbon in the following dialog boxes:

- **Rebar catalog**
- **Select rebar**
- **Shape catalog**
- **Select shape**

By default, the ribbon is shown in catalog dialog boxes, but hidden in selection dialog boxes.

- To show the ribbon, click the down arrow at the right side of the (**Home**) ribbon title bar.
- To hide the ribbon, click the up arrow at the right side of the (**Home**) ribbon title bar.

Work with property columns in the catalog view

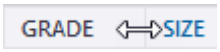
You can organize the catalog view by showing and hiding the property columns, and by changing the order, sort order, and width of the columns.

You can organize the columns in the catalog view in the following dialog boxes:

- **Rebar catalog**
- **Select rebar**
- **Shape catalog**
- **Select shape**

NOTE The **Star** column is always visible and you cannot hide it.

To	Do this
Show or hide a property column	1. Click **Show columns** to open a list of the available property columns. A check mark in front of a column name indicates that the column is visible. 2. To show a column, click the column name to add a check mark in front of the column name. 3. To hide a column, click the column name to remove the check mark.
Change the order of the property columns	Drag a column header to a new location.

To	Do this
Change the sort order of a property column	Click the column header. The arrow symbol next to the column header indicates if the sort order is ascending ▲ or descending ▼. To sort values by two properties and in two columns: 1. Sort by one column. 2. Hold down **Shift** and then sort by the other column.
Resize a property column	Drag the edge between this and the following column header. For example:  You can also click **Fit columns** to adjust the widths of the visible columns so that the longest value in each column (or the column header in the shape catalog) is shown. This does not affect the widths of the columns you have manually resized.

Filter shapes

Filtering shapes helps to narrow down the number of shapes shown in the shape catalog view.

You can filter shapes in both the **Shape catalog** dialog box and the **Select shape** dialog box. You can use filtering together with other methods, such as sorting.

1. Open the **Shape catalog** dialog box or the **Select shape** dialog box.
   - On the **File** menu, click **Catalogs** --> **Shape catalog** to open the **Shape catalog** dialog box.
   - To open the **Select shape** dialog box, click the **...** button next to the **Shape** box in the item properties, or in a component dialog box.
2. In the **Filter** box, type the search term or filtering criteria.
3. Select a group or sub-group.

   Tekla Structures shows the matching shapes in the selected group.

Add shapes to the Starred group

You can add stars to important or preferred shapes, so that you can easily find these shapes later. Shapes to which you add stars appear in the **Starred** group in the shape catalog.

Starring is user-specific, so it is only visible to you. The starring settings are stored in the `shape_catalog.settings.user.<username>` file in the current model folder.

1. Open the **Shape catalog** dialog box or the **Select shape** dialog box.
   - On the **File** menu, click **Catalogs** --> **Shape catalog** to open the **Shape catalog** dialog box.
   - To open the **Select shape** dialog box, click the **...** button next to the **Shape** box in the item properties, or in a component dialog box.
2. Browse or search for the shapes to which you want to add stars.
3. In the list of shapes, click the white star symbol in the **Star** column for each shape that you want to add to the **Starred** group.

   By default, the **Star** column is the first column and the star symbol is at the beginning of each shape row.

   The star symbol turns yellow  and the shape is added to the **Starred** group.

To remove a shape from the **Starred** group, click the yellow star symbol on the shape row. The star symbol turns white again.

Add tags to shapes

In the **Shape catalog** dialog box, you can add tags to shapes to add keywords or other metadata to the shapes.

Tags are model-specific and saved in the `ShapeCatalog.Groups.User.<username>.xml` file in the current model folder.

1. On the **File** menu, click **Catalogs** --> **Shape catalog** to open the **Shape catalog** dialog box.
2. Select the shapes that you want to tag.
3. In the **Tags** box at the bottom-right corner of the **Shape catalog** dialog box, enter the keywords or metadata, then press **Enter**.

   To add several tags to a shape, enter the next tag in the next tag box, then press **Enter**.

   Each group of tagged shapes appears with the  symbol under **Tags** in the list of groups.

4. Click  **Save** to save the changes to the shape catalog.

Remove tags from shapes or delete tags
You can remove tags from shapes or delete tags when they are no longer needed.

1. On the **File** menu, click **Catalogs** --> **Shape catalog** to open the **Shape catalog** dialog box.
2. Remove or delete tags.
   - To remove a tag from a shape, select the shape, then click the **X** symbol after the tag name in the **Tags** section in the property area.
   - To delete a tag, select the tagged group, select all the shapes in the group, then click the **X** symbol after the tag name in the **Tags** section in the property area.
3. Click  **Save** to save the changes to the shape catalog.

Import shapes into Tekla Structures

You can import the following types of shape files:

- `dgn`
- `dwg`
- `dxf`
- `ifc`
- `ifcXML`
- `ifcZIP`
- `iges`
- `igs`
- `shapecatalog`
- `skp`
- `step`
- `stp`
- `tsc`

When you import a shape into the shape catalog, Tekla Structures creates two files: one `.xml` file for shape attributes, such as the name and GUID, and one `.tez` file for geometric properties, such as coordinates. The files are saved

in the current model folder under the `\Shapes` and `\ShapeGeometries` sub-folders.

The shape name that is shown in the shape catalog is determined as follows:

- If you import a `.tsc` or `.shapecatalog` file, the shape name is read from the imported file.
- If you import other file types, the shape name is the name of the imported file.

TIP You can also download shapes from Tekla Warehouse, or create shapes using existing geometry (page 295) in Tekla Structures models.

Import shapes

When you use other modeling software to model shapes that you want to import into Tekla Structures, we recommend that you center parts around the origin and direct the parts along the x axis.

From Tekla Structures models you can also import shape catalog groups (page 296) either with the shapes as `.shapecatalog` files or without the shapes as `.ShapeCatalog.Groups.xml` files.

1. Open the model into which you want to import shapes or shape catalog groups.
2. On the **File** menu, click **Catalogs** --> **Shape catalog** to open the **Shape catalog** dialog box.
3. To import shapes without the group structure into a certain group or sub-group in the shape catalog, select the group or sub-group on the left side of the dialog box.

   If you do not select a group, Tekla Structures imports the shapes into the **Ungrouped** group.
4. Click  **Import**.
5. In the **Import shape definitions** dialog box, browse to the folder that contains the files to be imported, select the files, then click **Open**.

   Tekla Structures checks if there are duplicates in the shapes in the import files compared to the existing shape catalog.

   In the **Import** dialog box, you can see the **Status** of each imported shape, such as New shape definition or Shape name already exists. If a shape has already been used in the model, you can also see the **Instances** of the shape.
6. If shapes with the same name and GUID as the shapes being imported already exist in the shape catalog, replace or keep the existing shapes. In the **Import** dialog box:

- Select **Overwrite** for each existing shape that you want to replace with a new, imported shape.
- Deselect **Overwrite** for each existing shape that you want to keep unchanged.

7. In the **Import** dialog box, click **Import**.

   Importing a large file can take several minutes.

8. Click **OK** to complete the import.

   The groups that contain new or modified shapes are marked with  on the left side of the **Shape catalog** dialog box. The new or modified shape rows are highlighted in yellow in the list of shapes.

9. Click  **Save** to save changes to the shape catalog.

Shape import has three possible results:

- Tekla Structures imports the shape as a watertight solid shape. All solid operations are available.
- Tekla Structures imports the shape as a non-solid shape. A non-solid shape means that the object might not be watertight. For example, it has holes, or is missing a face or an edge.
- Import fails. The import can fail for several reasons, such as if the shape is very complex or has no volume. There might also be a tolerance difference between Tekla Structures and the original software that was used to create the shape. To find out why the import failed, check the session history log by going to **File menu** --> **Logs** --> **Session history log**.

The **Solidity** column in the shape catalog shows whether a shape is solid or non-solid.

Example: Import a shape from SketchUp Pro

This example shows how to import a solid 3D shape from Trimble SketchUp Pro to a Tekla Structures model.

1. Create an empty model in SketchUp Pro.

   Delete any extra entities, such as the default person on the drawing area.

2. Create a group of entities.

   Although Tekla Structures supports importing separate individual entities, we recommend you create a group of entities or a component in SketchUp.

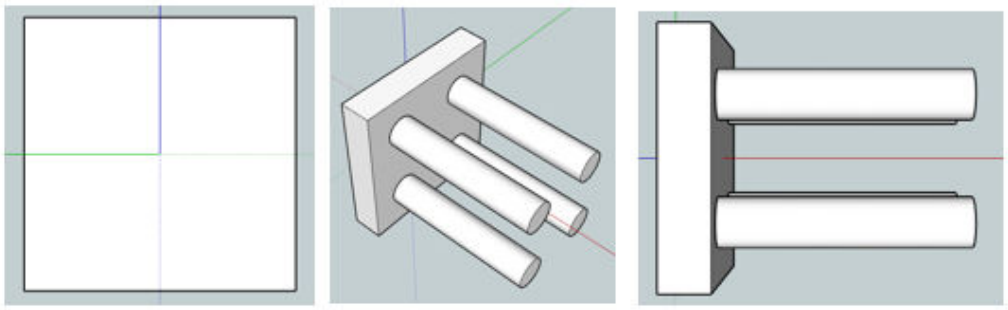
   All SketchUp groups and components should form watertight solids. Select the group or component and open **Entity Info** to check that the selection is a solid. SketchUp solids have a volume. If there is no volume listed, the selection is not a solid.

3. Select the group and click **Solid Tools** --> **Union** to make the group of entities into a union of solids.

   Your group becomes a single solid volume: a solid.

4. Place the solid in SketchUp so that it lies along the positive x axis (red), and halfway on both y (green) and z axes (blue). In Tekla Structures, the yellow and magenta part handles will align with the x axis used in SketchUp.

   The location and rotation of the solid in SketchUp are important, since they determine how an item is inserted and positioned in Tekla Structures. Different positioning in SketchUp causes an offset in Tekla Structures.



5. Save the SketchUp file.
6. In your Tekla Structures model, open the **Shape catalog** dialog box and click  **Import**.
7. Select the SketchUp file.
8. Click **Import**.

Tekla Structures imports the shape to the shape catalog and you can use it to define the shape of an item or a concrete item.

Export shapes

You can export shapes and shape catalog groups together or separately from each other.

TIP You can also upload shapes to Tekla Warehouse.

---

1. Open the model from which you want to export shapes or shape catalog groups.
2. On the **File** menu, click **Catalogs** --> **Shape catalog** to open the **Shape catalog** dialog box.
3. Do one of the following to export shapes or groups:

To	Do this
Export all the shapes in the catalog, but not the group structure	On the **Shape catalog** ribbon, click  **Export** --> **Export all shapes**.
Export all the shapes and groups in the catalog	On the **Shape catalog** ribbon, click  **Export** --> **Export all shapes with groups**.
Export the group structure of the catalog, but not the shapes	On the **Shape catalog** ribbon, click  **Export** --> **Export group structure only**.
Export all the shapes in a group or sub-group	Select the group or sub-group, right-click, and select **Export shapes**. For example, you can export the shapes in the **Starred** group, or groups of tagged shapes.
Export all the shapes in a group or sub-group and also the group	Select the group or sub-group, right-click, and select **Export shapes with group**.
Export a group or sub-group and its sub-groups, but not the shapes	Select the group or sub-group, right-click, and select **Export selected group structure only**.
Export one or more individual shapes	Select the shapes (page 299), right-click, and select **Export**.

4. In the **Export to** dialog box, browse to a folder, enter a name for the export file, and then click **Save**.

   If you are only exporting one individual shape, browse to and select a folder for the export file, then click **Select folder** in the **Export to** dialog box. The shape name is used as the name of the export file.

Tekla Structures saves the export file in the selected folder. When the export is completed, you can click **Open folder** to open the export folder.

The file name extension of the export file depends on the exported content, being:

- `.tsc` if only one shape is exported
- `.shapecatalog` if several shapes or both shapes and groups are exported
- `.ShapeCatalog.Groups.xml` if only the group structure is exported

Compress shape geometry files

You can compress shape geometry files by converting the files from `.xml` format to compressed format `.tez`. Using the `.tez` format saves disk space.

In Tekla Model Sharing models, the shape geometry files are automatically converted from `.xml` to `.tez`.

In models that are not shared, you can manually compress the shape geometry files that are stored in the `\ShapeGeometries` sub-folder in the current model folder. The files in the `\Shapes` sub-folder are not compressed.

If you have already used any of the shapes for items in the model, they work the same way even after compression.

NOTE Compression is a permanent action. You cannot undo it even if you do not save the model.

To compress existing shape geometry files, either re-import the original shape files (page 308), or use the **Compress shape geometries** application.

1. Open the model for which you want to compress shape geometry files.
2. Click the **Applications & components** button  in the side pane to open the **Applications & components** catalog.
3. Search for the **Compress shape geometries** application, then double-click to open it.
4. In the **Compress shape XML files to TEZ format** dialog box, click **Compress**.
5. Close the model, then open it again.

Clean or restore shape geometry files

If some previously imported shapes cause missing faces or edges in items or drawings, you can clean the shape geometry files.

Cleaning means that Tekla Structures investigates and corrects the shape geometry, and tries to create solid objects.

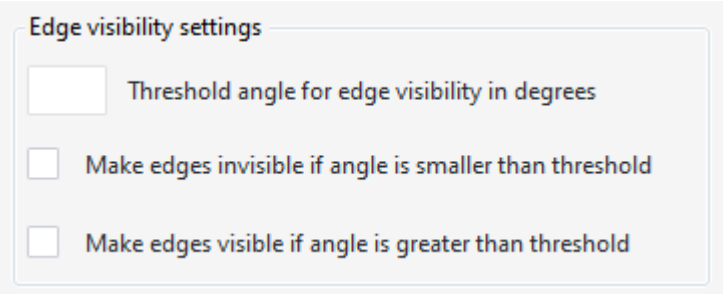
Clean shape geometry files

To clean existing shape geometry files, either re-import the original shape files (page 308), or use the **Shape cleaner** application as follows:

1. Open the model for which you want to clean shape geometry files.
2. Click the **Applications & components** button  in the side pane to open the **Applications & components** catalog.
3. Search for the **Shape cleaner** application, then double-click to open it.

   The **Shape cleaner** dialog box opens.

4. Select the shapes that you want to clean.
5. If you need to hide unnecessary edges or show more edges in the selected shapes, use the **Edge visibility settings**.



   a. Enter a threshold value for the angle between the neighboring faces in each of the selected shapes.
   b. To hide edges when the neighboring shape faces are in a smaller angle than the threshold value, select the first check box.
   c. To show edges when the neighboring shape faces are in a greater angle than the threshold value, select the second check box.

   Shapes with too many visible or invisible edges can affect how various Tekla Structures features operate on items that are created using those shapes. For example, creating rebar sets might fail if complex shapes have too many edges visible.
6. To create backups of the shape geometry files, select **Create backups from shapes before cleaning**.

   Creating backups of the original shape geometry files allows you to restore them if needed.
7. Click **Clean**.

   Tekla Structures cleans the shapes and shows how many shapes resulted in being solid objects and how many non-solid.

   If you need to interrupt the cleaning process, you can click **Stop**.
8. To see the changed shape geometry in the items in the model, close the model, then open it again.

Restore the original shape geometry files

If you have created backup files, you can restore the original shape geometry files if you are not happy with the result of the cleaning.

1. Open the **Shape cleaner** dialog box again.
2. Select the shapes that you want to restore.
3. Click **Revert**.

Customize the bolt catalog

The individual *bolt assembly elements*, such as bolts of different sizes and lengths, nuts and washers, are listed in the bolt catalog. Each *bolt assembly* then consists of these bolt assembly elements. You cannot use a bolt if it does not belong to a bolt assembly. The bolt assemblies are listed in the bolt assembly catalog.

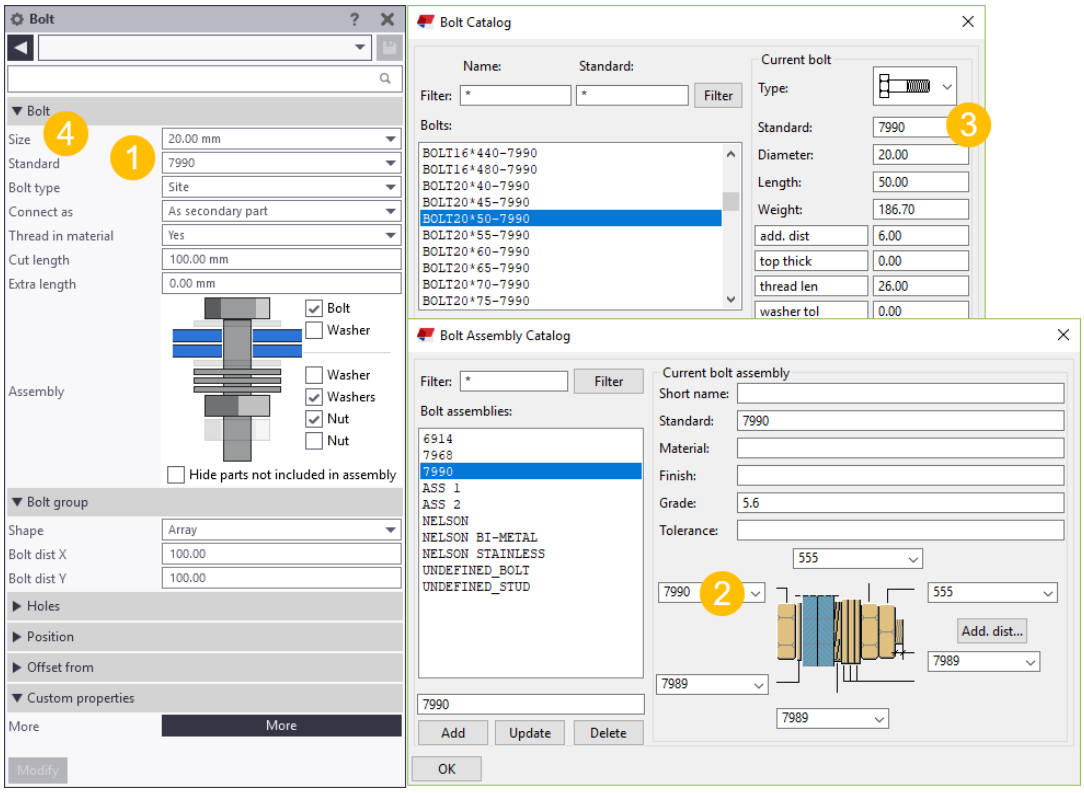
Tekla Structures stores the bolt catalog information in the `screwdb.db` file and the bolt assembly catalog information in the `assdb.db` file.

See also

How the bolt catalog and bolt assembly catalogs work together (page 315)

How bolt and bolt assembly catalogs affect length calculation (page 322)

How the bolt catalog and bolt assembly catalogs work together



(1) The **Bolt standard** options are read from the bolt assembly catalog.

(2) The bolt assembly catalog defines which bolt standard is used in the bolt assembly.

(3) The bolt catalog contains the different bolt diameters, lengths, and other properties used in the bolt standard.

(4) The **Bolt size** options are read from the bolt catalog depending on the selected **Bolt standard** option.

Manage bolts and bolt assemblies

In the bolt catalog and the bolt assembly catalog, you can add, modify, and delete bolts and bolt assemblies.

Add a bolt to the catalog

You must add individual bolt elements, such as bolts, nuts, and washers, to the bolt catalog before you can define bolt assemblies and use them in a model.

These steps are for adding bolts, but they also apply to adding nuts and washers.

TIP You can also add bolts by importing them into the bolt catalog.

---

1. On the **File** menu, click **Catalogs** --> **Bolt catalog** to open the **Bolt Catalog** dialog box.
2. Enter the name of the bolt in the following box:

   You can enter a maximum of 40 characters in the name box.
3. In the **Type** list, select an option to define the bolt element type.
4. Define the other properties of the new bolt.

   You can enter a maximum of 25 characters in the **Standard** box.

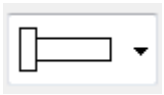
   Use different names for bolt, nut, washer, and stud standards to distinguish bolt element types from each other when defining bolt assemblies.
5. Click **Add** to add the bolt to the bolt catalog.

   You cannot use a bolt if it does not belong to a bolt assembly. Therefore, we recommend checking that the catalog also includes nuts and washers that work with the new bolt so that you can create a bolt assembly. If the catalog does not include suitable nuts and washers, add them the same way as you added the new bolt.
6. Click **OK**.

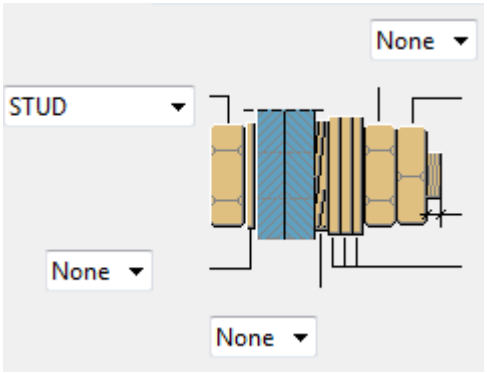
   The **Save confirmation** dialog box appears.
7. Select **Save changes to model folder** to save the changes in the `screwdb.db` file in the current model folder, and then click **OK**.

Add a stud bolt to the catalog

A stud is special type of bolt that is welded to steel parts to transfer loads between steel and concrete. You cannot use studs unless you have defined a stud assembly that contains the assembly's name and material.

1. On the **File** menu, click **Catalogs** --> **Bolt catalog** to open the **Bolt Catalog** dialog box.
2. Enter values for the following properties:
   - **Name**: Name for the stud bolt.
   - **Type**: 
   - **Standard**: This name is needed when creating a bolt assembly for the stud.
   - **Diameter**: Shank diameter.
   - **Length**: Stud length.
   - **Weight**: Stud weight.
   - **top thick**: Head thickness.
   - **top diameter**: Head diameter.

   The units depend on the settings in **File menu** --> **Settings** --> **Options** --> **Units and decimals** .
3. On the **File** menu, click **Catalogs** --> **Bolt assembly catalog** to open the **Bolt Assembly Catalog** dialog box.
4. Select the standard for the stud bolt.
5. Set all the other bolt assembly elements to **None**.



6. To create studs in the model, create bolts and select the stud assembly standard.

Modify bolt information in the catalog

1. On the **File** menu, click **Catalogs** --> **Bolt catalog** to open the **Bolt Catalog** dialog box.
2. Select a bolt from the list.
3. Modify the properties.
4. Click **Update**.
5. Click **OK**.

   The **Save confirmation** dialog box appears.
6. Select **Save changes to model folder** to save the changes in the `screwdb.db` file in the current model folder, and then click **OK**.

Delete a bolt from the catalog

1. On the **File** menu, click **Catalogs** --> **Bolt catalog** to open the **Bolt Catalog** dialog box.
2. Select a bolt from the list.

   Use the **Shift** and **Ctrl** keys to select multiple bolts.
3. Click **Delete**.
4. Click **OK**.

   The **Save confirmation** dialog box appears.
5. Select **Save changes to model folder** to save the changes in the `screwdb.db` file in the current model folder, and then click **OK**.

Add a bolt assembly to the catalog

You can add new bolt assemblies to the bolt assembly catalog. The bolt assembly can contain only bolts or studs, but not both.

1. On the **File** menu, click **Catalogs** --> **Bolt assembly catalog** to open the **Bolt Assembly Catalog** dialog box.
2. Enter the name of the bolt assembly in the following box:

3. Define the other properties of the new bolt assembly.

   You can enter a maximum of 30 characters in the **Standard** box. For all the other properties, you can enter a maximum of 25 characters.
4. Click **Add** to add the bolt assembly to the catalog.
5. Click **OK**.

   The **Save confirmation** dialog box appears.

6. Select **Save changes to model folder** to save the changes in the `assdb.db` file in the current model folder, and then click **OK**.

Modify bolt assembly information in the catalog

1. On the **File** menu, click **Catalogs** --> **Bolt assembly catalog** to open the **Bolt Assembly Catalog** dialog box.
2. Select a bolt assembly from the list.
3. Modify the properties (page 327).
4. Click **Update**.
5. Click **OK**.

   The **Save confirmation** dialog box appears.
6. Select **Save changes to model folder** to save the changes in the `assdb.db` file in the current model folder, and then click **OK**.

Delete a bolt assembly from the catalog

1. On the **File** menu, click **Catalogs** --> **Bolt assembly catalog** to open the **Bolt Assembly Catalog** dialog box.
2. Select a bolt assembly from the list.
3. Click **Delete**.
4. Click **OK**.

   The **Save confirmation** dialog box appears.
5. Select **Save changes to model folder** to save the changes in the `assdb.db` file in the current model folder, and then click **OK**.

Import and export bolts and bolt assemblies

You can import and export bolts and bolt assemblies to merge bolts and bolt assemblies across catalogs.

Importing and exporting bolt catalogs is useful, when you:

- Upgrade to newer version of Tekla Structures and you want to use a customized bolt catalog from a previous version.
- Want to combine bolt catalogs that are stored in different locations.
- Want to share bolt catalog information with other users.

Bolts, bolt assemblies, and bolt catalogs are imported and exported as the following types of files:

- Bolts: `.bolts`
- Bolt assemblies: `.bass`
- Bolt catalogs: `.lis`

When you export single bolts or bolt assemblies, you can select the bolts or bolt assemblies that you want to include in the export file. When you import and export bolt assemblies, all the related bolt elements (bolts, studs, screws, nuts, washers) are also included in the export file.

You can import and export an entire bolt catalog. You can also import a part of an exported bolt catalog.

TIP You can also download or share bolt assemblies using Tekla Warehouse.

Import bolts to the catalog

Bolts are imported and exported as `.bolts` files. A `.bolts` file can include one bolt or several bolts.

1. On the **File** menu, click **Catalogs** --> **Bolt catalog** to open the **Bolt Catalog** dialog box.
2. Right-click in the **Bolts** list, then select **Import**.
3. Select the import file.
4. Click **OK**.

   The bolts are shown on the **Bolts** list by their original names.
5. Click **OK**.

   The **Save confirmation** dialog box opens.
6. To save the changes in the `screwdb.db` file in the current model folder, select **Save changes to model folder**, then click **OK**.

Export bolts from the catalog

Bolts are imported and exported as `.bolts` files. A `.bolts` file can include one bolt or several bolts.

1. On the **File** menu, click **Catalogs** --> **Bolt catalog** to open the **Bolt Catalog** dialog box.
2. From the **Bolts** list, select one or more bolts.

   Use the **Shift** and **Ctrl** keys to select multiple bolts.
3. Right-click in the **Bolts** list, then select **Export**.
4. Browse for the folder where you want to save the export file.
5. In the **Selection** field, enter a name for the file.
6. Click **OK**.

Import bolt assemblies to the catalog

Bolt assemblies are imported and exported as `.bass` files. A `.bass` file can include one bolt assembly or several bolt assemblies.

1. On the **File** menu, click **Catalogs** --> **Bolt assembly catalog** to open the **Bolt Assembly Catalog** dialog box.
2. Right-click in the **Bolt assemblies** list, then select **Import**.
3. Select the import file.
4. Click **OK**.

   The bolt assemblies are shown on the **Bolt assemblies** list with their original names.
5. Click **OK**.

   The **Save confirmation** dialog box opens.
6. To save the changes in the `assdb.db` file in the current model folder, select **Save changes to model folder**, then click **OK**.

Export bolt assemblies from the catalog

Bolt assemblies are imported and exported as `.bass` files. A `.bass` file can include one bolt assembly or several bolt assemblies.

1. On the **File** menu, click **Catalogs** --> **Bolt assembly catalog** to open the **Bolt Assembly Catalog** dialog box.
2. From the **Bolt assemblies** list, select one or more bolt assemblies.

   Use the **Shift** and **Ctrl** keys to select multiple bolt assemblies.
3. Right-click in the **Bolt assemblies** list, then select **Export**.
4. Browse for the folder where you want to save the export file.
5. In the **Selection** field, enter a name for the file.
6. Click **OK**.

Import a bolt catalog

Bolt catalogs are imported to Tekla Structures models as `.lis` files.

1. Open the model into which you want to import a bolt catalog.
2. Copy the `screwdb.lis` file that you want to import to the current model folder.
3. To import the bolt catalog file `screwdb.lis` from the current model folder, go to **Quick Launch**, start typing `import bolt catalog`, and select the **Import Bolt Catalog** command from the list that appears.

   Tekla Structures does not replace entries that have the same names as the entries in the import file.
4. Check the status bar for error messages.

   To view errors, select **File** --> **Logs** --> **Session history log** .

Import part of the bolt catalog
If you do not want to import the entire bolt catalog, you can select the parts to be imported.

TIP If you only want to import a few bolts or bolt assemblies, use the import and export commands for the corresponding catalogs.

1. Open the model that contains the bolt catalog that you want to use.
2. Go to **Quick Launch**, start typing `export bolt catalog`, and select the **Export Bolt Catalog** command from the list that appears.

   The bolt catalog is saved as the `screwdb.lis` file in the current model folder.
3. Open the `screwdb.lis` file using a text editor, such as Microsoft Notepad.

   Each entry is listed on a separate row.
4. Delete the unwanted rows from the file.

   WARNING Do not delete the `STARTLIST` and `ENDLIST` rows.
5. Save the file with the name `screwdb.lis`.
6. Open the model into which you want to import the bolt catalog.
7. Copy the `screwdb.lis` file that you want to import to the current model folder.
8. To import the bolt catalog file `screwdb.lis` from the current model folder, go to **Quick Launch**, start typing `import bolt catalog`, and select the **Import Bolt Catalog** command from the list that appears.

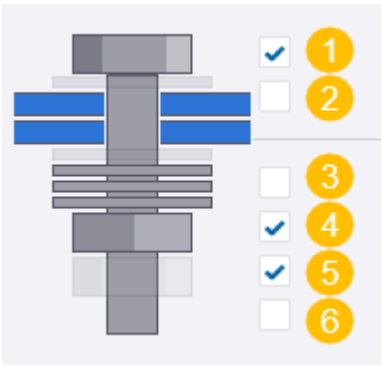
Export an entire bolt catalog
Bolt catalogs are exported from Tekla Structures models as `.lis` files.

1. Open the model that contains the bolt catalog that you want to export.
2. Go to **Quick Launch**, start typing `export bolt catalog`, and select the **Export Bolt Catalog** command from the list that appears.

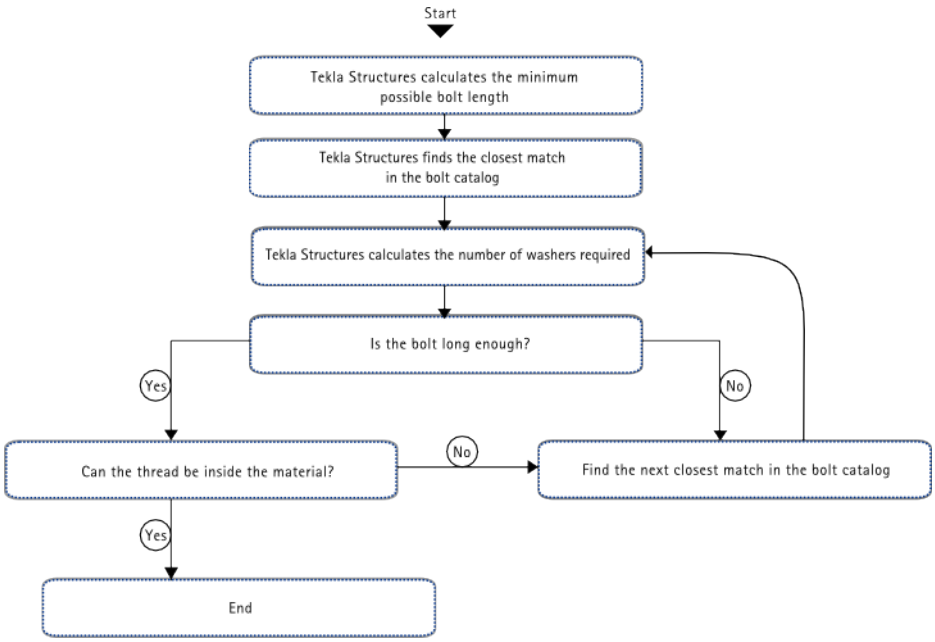
The exported bolt catalog is the `screwdb.lis` file in the current model folder.

How bolt and bolt assembly catalogs affect length calculation
Tekla Structures uses values from the bolt catalog and the bolt assembly catalog when it calculates the bolt length. If the bolt catalog does not contain long enough bolts for your purposes, you must add them to the bolt catalog.

The following **Assembly** settings in the **Bolt** properties affect the bolt length calculation. If the check box is selected, the bolt element is used in the bolt assembly.

Bolt assembly	Bolt elements
	**1:** If the check box is clear, only a hole is created **2:** Washer (1) **3:** Washer (2) **4:** Washers (3) **5:** Nut (1) **6:** Nut (2)

The chart and the detailed steps below explain the process of bolt length calculation.



1. Tekla Structures calculates the **minimum possible length** of the bolt as follows:

   washer (1) thickness (if the check box is selected) +

   material thickness +

   washer (2) thickness (if the check box is selected) +

   washer (3) thickness (if the check box is selected) +

   nut (1) thickness +

   nut (2) thickness +

   extra length

2. Tekla Structures searches for the **closest match** in the bolt catalog.

3. Tekla Structures calculates the **number of washers required** (must not exceed 10) so that the **length of the shaft is less than**:

   nut (1) thickness +

   material thickness +

   nut (2) thickness +

   washer (1) thickness +

   washer (2) thickness +

   (number of washers*washer (3) thickness)

4. Tekla Structures checks that the **bolt found in step 2 is longer than**:

   extra length +

   nut (1) thickness +

   material thickness +

   nut (2) thickness +

   add. dist (from the bolt catalog) +

   washer (1) thickness +

   washer (2) thickness +

   (number of fitting washers * washer (3) thickness)

5. If the selected bolt does not fulfill the criteria in step 4, Tekla Structures returns to step 2, otherwise it continues on to step 6.

6. Tekla Structures checks that the selected bolt fulfills **all the following conditions**:

   - Can the thread be inside the material to be connected? Even if this is **not** allowed, the calculation always allows 3 or 4 mm of thread to be inside the material, depending on the bolt diameter. If the bolt diameter is ≥ 24 mm, it allows 4 mm, otherwise it allows 3 mm.
   - Shaft length must be more than:

     material thickness +

     extra length +

     washer (1) thickness (if checked) -

     maximum thread in material allowed (if thread in material = no) = 3 mm or 4 mm
   - Shaft length is calculated as:

     Screw length - screw thread length - thread end.

- Thread end is the part of the bolt between the shaft and the thread. It is calculated as follows:

Diameter of bolt (mm)	Thread end (mm)
>33.0	10.0
>27.0	8.0
>22.0	7.0
>16.0	6.0
>12.0	5.0
>7.0	4.0
>4.0	2.5
≤4	1.5

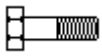
7. If the selected bolt does not fulfill **all** the above conditions, Tekla Structures returns to step 2 and tries the next longest bolt.
8. If the advanced option is set, the epsilon thickness is added to, or subtracted from, the material thickness to avoid inaccurate bolt length calculation.

   For example, if this value is not taken into account, and the calculated length is 38.001 mm, a 39 mm bolt might be selected.

Bolt catalog properties

Use the **Bolt Catalog** dialog box to view and modify the properties of individual bolt elements, such as bolts, washers, and nuts.

The units depend on the settings in **File menu** --> **Settings** --> **Options** --> **Units and decimals** .

Option	Description
Type	The type of the bolt element. The options are:     (Nut)  (Washer)

Option	Description
	 (Stud)
Standard	The name of the bolt element standard. Used in the **Bolt Assembly Catalog** dialog box for defining bolt elements in a bolt assembly. Use different names for bolt, nut, washer, and stud standards to distinguish bolt element types from each other.
Diameter	The diameter of the bolt element.
Length	The length of the bolt element.
Weight	The weight of the bolt element.
add. dist	The length of the part of the bolt that protrudes from the nut. The value is used in bolt length calculation.
top thick	The thickness of the bolt head.
thread len	The length of the threaded part of the bolt shaft. The value is not used in bolt length calculation (value is 0) if the bolt is fully-threaded.
washer tol	The tolerance between the washer inner diameter and the bolt diameter. The value is used when searching for the correct-sized washer for the bolt. Not used in bolt length calculation.
span size	The size of the wrench needed.
calc thick	The calculation thickness of a nut or a washer. This value is used in bolt length calculation.
real thick	The true thickness of a nut or a washer. This is for information only.
inner diam	The inner diameter of a nut or a washer. This is for information only.
outer diam	The outer diameter of a nut or a washer. This is for information only.
top diam	The diameter of the hexagon.  This is for information only.

See also

Manage bolts and bolt assemblies (page 316)

How the bolt catalog and bolt assembly catalogs work together (page 315)

Bolt assembly catalog properties

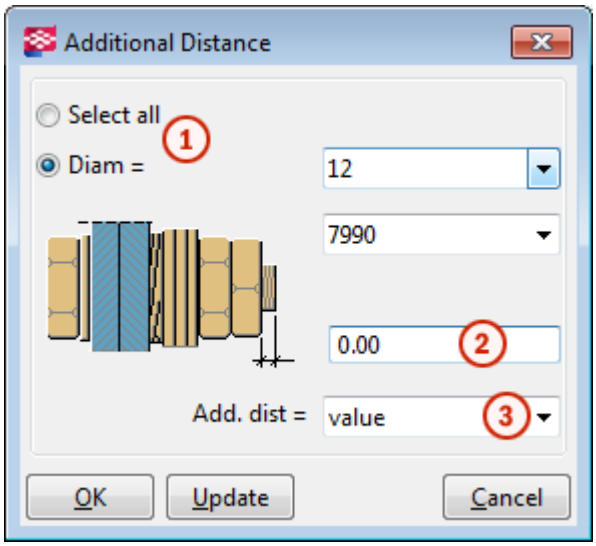
Use the **Bolt Assembly Catalog** dialog box to view and modify the properties of bolt assemblies.

The units depend on the settings in **File menu** --> **Settings** --> **Options** --> **Units and decimals** .

Option	Description
Short name	This name is used in drawings and reports. It is usually the commercial name for a specific bolt.
Standard	This name is the full name which is shown in the bolt assemblies list in the **Bolt Assembly Catalog** dialog box, and in the **Bolt standard** list in the **Bolt Properties** dialog box. The value is used in bolt length calculation.
Material	The material of the bolt assembly.
Finish	The type of the finish.
Grade	The grade of the bolt assembly.
Tolerance	The tolerances of the bolt assembly. This is for information only. The values cannot be reported, for example.

Additional length for bolt calculation

Option	Description
Add. dist...	The **Additional Distance** option controls how much of the bolt protrudes from the nut. **Additional Distance** updates the **Additional Distance** values of all bolts that use the selected bolt standard and have the selected diameter. The value is used in bolt length calculation.



1. Select whether the value of the additional length affects all or individual diameters of one bolt assembly.
2. Enter the additional length value.
3. Select whether the value is absolute or relative to the diameter.

See also

Manage bolts and bolt assemblies (page 316)

Customize the rebar catalog

The rebar catalog contains definitions for different reinforcement types, such as reinforcing bars and strands of different grades.

The rebar catalog shows standard, environment-specific reinforcing bars and strands of the environment (or environments) that you have installed and that is currently open. The blank project environment only contains undefined reinforcing bars and strands.

You can add, copy, group, modify, and delete rebar definitions. You can also import and export single definitions, groups of definitions, or entire rebar catalogs.

Tekla Structures stores the rebar catalog information in the `rebar_database.inp` file that is by default saved to the current model folder.

Reinforcement meshes are not included in the rebar catalog. Standard meshes are defined in their own catalog file (page 69), `mesh_database.inp`.

Work with definitions in the rebar catalog

You can add, copy, modify, and delete rebar definitions in the rebar catalog.

To use the newly added or modified rebar definitions in the model, reopen the model.

Create a new rebar definition

You can add new definitions to the rebar catalog by defining the bar properties.

1. On the **File** menu, click **Catalogs** --> **Rebar catalog** to open the **Rebar catalog** dialog box.
2. Click  **New bar**.
3. In the **New bar** dialog box, enter the bar properties.

   If a property is shown in red, it is missing a value or has a value that is not valid. For example, **Grade** and **Size** must have a value.
4. Click **Add**.
5. Click  **Save** to save the changes to the rebar catalog.

Create a new rebar definition by copying an existing definition

You can add new definitions to the rebar catalog by copying an existing definition and then modifying it.

1. On the **File** menu, click **Catalogs** --> **Rebar catalog** to open the **Rebar catalog** dialog box.
2. Browse for and select the definition that you want to copy.
3. Click  **Copy**.
4. In the **Copy** dialog box, enter or modify the bar properties.

   Modify the property values that are shown in red so that the new definition is not the same as the original definition.
5. Click **Add**.
6. Click  **Save** to save the changes to the rebar catalog.

Select rebar definitions

Selecting different sets of definitions is useful when you want to export or add tags to rebar definitions, or modify a sub-set of definitions.

You can use these methods when you select rebar definitions in the **Rebar catalog** dialog box.

- Use the following commands on the catalog ribbon:
  - Click **Select all** to select all the definitions in the currently visible group.

    Alternatively, you can select one definition and then press **Ctrl+A**.
  - Click **Select none** to clear the current selection.
  - Click **Invert selection** to select the currently unselected definitions and to deselect the currently selected definitions.
- To select several consecutive definitions, select the first definition, then hold down **Shift** and select the last definition.
- To select several non-consecutive definitions, select the first definition, then hold down **Ctrl** and select the other definitions.

Modify a rebar definition

1. On the **File** menu, click **Catalogs** --> **Rebar catalog** to open the **Rebar catalog** dialog box.
2. Browse for and select the definition that you want to modify.

   To modify several definitions, hold down **Ctrl** or **Shift** when you select them.
3. In the property area on the right side of the **Rebar catalog** dialog box, modify the bar properties.

   For example, you can select whether the bar is a main bar, or a tie or stirrup. Or you can adjust hook lengths or lap lengths, or tolerances for rebar shape recognition. You might also want to add tags to the bar.

   If a property is shown in red, it is missing a value or has a value that is not valid. For example, **Grade** and **Size** must have a value.
4. Click  **Save** to save the changes to the rebar catalog.

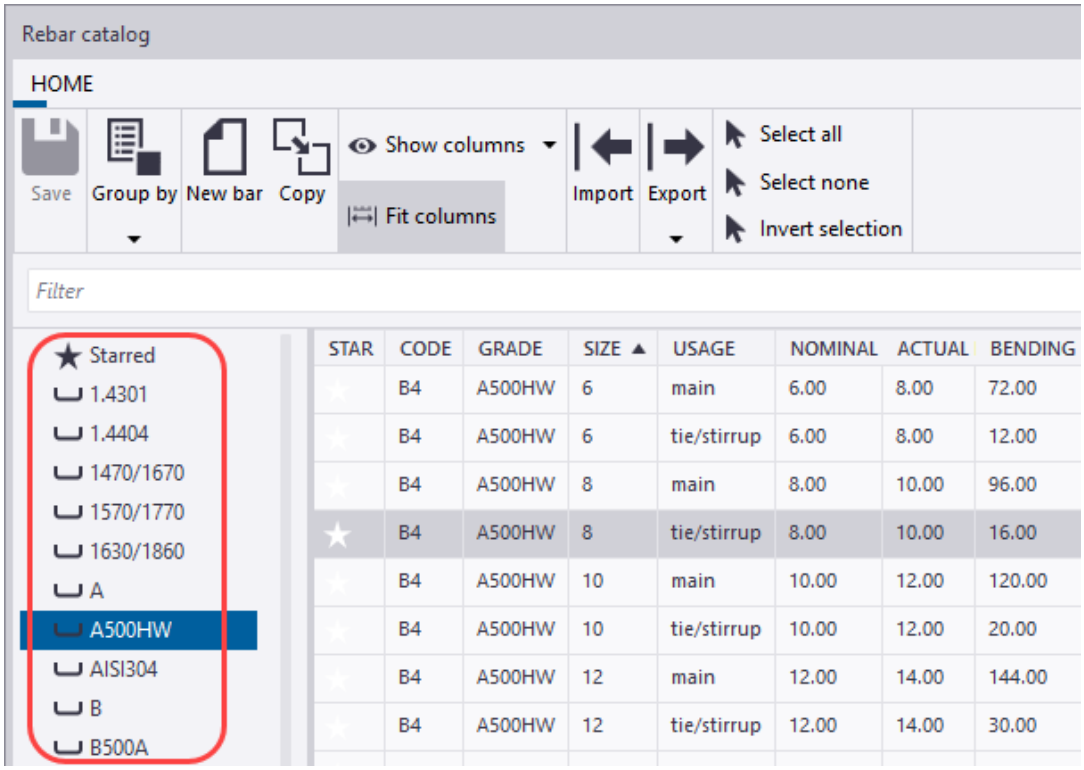
Delete rebar definitions

1. On the **File** menu, click **Catalogs** --> **Rebar catalog** to open the **Rebar catalog** dialog box.
2. Select one or more rebar definitions.
3. Right-click and select **Delete**.
4. Click **Yes** to confirm the deletion.
5. Click  **Save** to save the changes to the rebar catalog.

Work with groups in the rebar catalog

In the rebar catalog, the rebar definitions are arranged in groups. You can add, copy, modify, and delete groups, and arrange the groups according to different properties.

The groups are listed on the left side of the **Rebar catalog** and **Select rebar** dialog boxes.



By default, the definitions in the rebar catalog are grouped according to reinforcement grades. You can change how the definitions are grouped (page 335) in the **Rebar catalog** dialog box or in the **Select rebar** dialog box.

To use the newly added or modified rebar definition groups in the model, reopen the model.

Add a new group to the catalog

You can create new groups in the rebar catalog by copying an existing group and the definitions contained in it.

1. On the **File** menu, click **Catalogs** --> **Rebar catalog** to open the **Rebar catalog** dialog box.
2. On the left side of the dialog box, select a group, and then click 
   Copy.

   Alternatively, you can right-click a group and select **Copy**.

3. In the **New group name** dialog box, enter a name for the new group, and then click **Copy**.

   Tekla Structures adds the new group to the catalog.

4. Add, modify, and delete definitions (page 328) contained in the new group as needed.

5. Click  **Save** to save the changes to the rebar catalog.

Modify a group in the catalog

1. On the **File** menu, click **Catalogs** --> **Rebar catalog** to open the **Rebar catalog** dialog box.
2. Select the group that you want to modify.
3. Select all definitions in the group.
4. In the property area on the right side of the **Rebar catalog** dialog box, modify the group properties.

   For example, you can change the grade or cranked length type. You may also want to add tags (page 338) to all definitions in the group.

5. Click  **Save** to save the changes to the rebar catalog.

Delete a group from the catalog

You can delete groups and the definitions contained in them from the rebar catalog.

1. On the **File** menu, click **Catalogs** --> **Rebar catalog** to open the **Rebar catalog** dialog box.
2. Select a group from the list on the left side of the dialog box.
3. Right-click and select **Delete**.
4. Click **Yes** to confirm the deletion.

5. Click  **Save** to save the changes to the rebar catalog.

Import and export rebar definitions

You can import and export rebar definitions to merge rebar definitions across different catalogs, models, and Tekla Structures environments and versions.

To use reinforcing bars and strands in other Tekla Structures models, you can export rebar definitions to a file (`*.inp`), then import the file into another Tekla Structures model.

TIP You can also download or share rebar catalog content using Tekla Warehouse.

Import definitions to the rebar catalog

You can customize the rebar catalog by importing rebar definitions from an `.inp` file.

1. Open the model to which you want to import rebar definitions.
2. On the **File** menu, click **Catalogs** --> **Rebar catalog** to open the **Rebar catalog** dialog box.
3. Click  **Import**.
4. In the **Import rebar definitions** dialog box, browse for the folder that contains the import file, select the file, then click **Open**.

   Tekla Structures checks if there are duplicates in the definitions in the import file compared to the rebar catalog.
5. If rebar definitions with the same properties as the definitions being imported already exist in the rebar catalog, a confirmation dialog box appears and you have the following three options:
   - Click **Overwrite** to replace all existing definitions with the newly imported definitions.
   - Click **Keep existing** to discard the duplicate definitions being imported and to only import the new definitions.
   - Click **Cancel** to not to import any definitions.
6. Click  **Save** to save the changes to the rebar catalog.
7. To use the newly imported definitions in the model, reopen the model.

Export definitions from the rebar catalog

You can export all or selected rebar definitions, or a selected group of a rebar catalog to a file (`.inp`).

1. Open the model from which you want to export rebar definitions.
2. On the **File** menu, click **Catalogs** --> **Rebar catalog** to open the **Rebar catalog** dialog box.
3. Do one of the following:
   - To export the entire catalog, click  **Export** --> **Export all**.

- To export a certain group only, select the group, right-click and select **Export**.
- To export certain definitions only, select the definitions, then click  **Export** --> **Export selected**.

  Alternatively, you can right-click one of the selected definitions, then select **Export**.

4. In the **Export as** dialog box, browse for a folder, enter a name for the export file, then click **Save**.

   By default, Tekla Structures saves the file to the current model folder.

   The file name extension is `.inp`.

Organize the rebar catalog view

You an organize the rebar catalog view to suit your needs and ways of working.

In the **Rebar catalog** dialog box, you can change how the rebar definitions are grouped, show or hide certain property columns, or change the order of the property columns. You can also filter definitions and mark them with stars and tags.

In the **Select rebar** dialog box, you can change how the rebar definitions are grouped, show or hide certain property columns, or change the order of the property columns. You can also filter definitions and mark them with stars.

The **Select rebar** dialog box opens when you click the **...** button next to the **Size** box in a reinforcement object's properties, or in a component dialog box to select a rebar definition.

The status bar at the bottom of the **Rebar catalog** and **Select rebar** dialog boxes shows useful information, such as:

- The number of definitions in the selected group.
- The property by which the definitions are grouped.
- The property by which the definitions are sorted.

  The arrow symbol indicates if the sort order is ascending  or descending  .

In the **Rebar catalog** dialog box, the status bar also shows the number of the selected definitions.

The changes that you make to the dialog box layout are automatically saved to the `rebar_catalog.settings.UI` file in the `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\Catalogs\` folder. Tekla Structures uses the saved layout next time that you open the dialog box.

Show or hide the catalog ribbon

You can show or hide the catalog ribbon in catalog dialog boxes and selection dialog boxes.

You can show or hide the catalog ribbon in the following dialog boxes:

- **Rebar catalog**
- **Select rebar**
- **Shape catalog**
- **Select shape**

By default, the ribbon is shown in catalog dialog boxes, but hidden in selection dialog boxes.

- To show the ribbon, click the down arrow at the right side of the (**Home**) ribbon title bar.
- To hide the ribbon, click the up arrow at the right side of the (**Home**) ribbon title bar.

Change the grouping of rebar definitions

You can select the property by which the rebar definitions are grouped in the rebar catalog. By default, the rebar definitions are grouped by grade.

You can also group the definitions by a property for which the property column is not visible.

The properties that are available might vary in the **Rebar catalog** and **Select rebar** dialog boxes.

1. Open the **Rebar catalog** dialog box or the **Select rebar** dialog box.
   - On the **File** menu, click **Catalogs** --> **Rebar catalog** to open the **Rebar catalog** dialog box.
   - To open the **Select rebar** dialog box, click the **Size** box in a reinforcement object's properties, or in a component dialog box.
2. Click  **Group by**, and then select the property by which you want to group the rebar definitions.

   For example, you can select **Size** or **Cross section area**.

Work with property columns in the catalog view

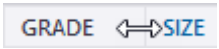
You can organize the catalog view by showing and hiding the property columns, and by changing the order, sort order, and width of the columns.

You can organize the columns in the catalog view in the following dialog boxes:

- **Rebar catalog**
- **Select rebar**
- **Shape catalog**

- **Select shape**

NOTE The **Star** column is always visible and you cannot hide it.

To	Do this
Show or hide a property column	1. Click **Show columns** to open a list of the available property columns. A check mark in front of a column name indicates that the column is visible. 2. To show a column, click the column name to add a check mark in front of the column name. 3. To hide a column, click the column name to remove the check mark.
Change the order of the property columns	Drag a column header to a new location.
Change the sort order of a property column	Click the column header. The arrow symbol next to the column header indicates if the sort order is ascending or descending . To sort values by two properties and in two columns: 1. Sort by one column. 2. Hold down **Shift** and then sort by the other column.
Resize a property column	Drag the edge between this and the following column header. For example:  You can also click **Fit columns** to adjust the widths of the visible columns so that the longest value in each column (or the column header in the shape catalog) is shown. This does not affect the widths of the columns you have manually resized.

Filter rebar definitions

Filtering rebar definitions helps to narrow down the number of rebar definitions shown in the rebar catalog view.

You can filter rebar definitions in both the **Rebar catalog** dialog box and the **Select rebar** dialog box. You can use filtering together with other methods, such as sorting.

1. Open the **Rebar catalog** dialog box or the **Select rebar** dialog box.
   - On the **File** menu, click **Catalogs** --> **Rebar catalog** to open the **Rebar catalog** dialog box.
   - To open the **Select rebar** dialog box, click the **Size** box in a reinforcement object's properties, or in a component dialog box.
2. In the **Filter** box, enter the search term or filtering criteria.

   For example, to find rebar definitions that are suitable for stirrups and ties, enter `tie`.

   Tekla Structures shows the groups that contain matching definitions.
3. Select a group.

   Tekla Structures shows the matching definitions in the group, for example, the definitions that have **Usage** set to **tie/stirrup**.

Add rebar definitions to the Starred group

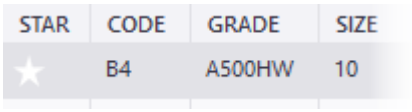
You can add stars to important or preferred rebar definitions, so that you can easily find these definitions later. Rebar definitions to which you add stars appear in the **Starred** group in the shape catalog.

Starring is user-specific, so it is only visible to you. The starring settings are stored in the current model folder in the `rebar_catalog.settings.user.<username>` file, where the `<username>` suffix is your username.

If you have starred definitions, the **Rebar catalog** dialog box opens with the **Starred** group selected.

1. Open the **Rebar catalog** dialog box or the **Select rebar** dialog box.
   - On the **File** menu, click **Catalogs** --> **Rebar catalog** to open the **Rebar catalog** dialog box.
   - To open the **Select rebar** dialog box, click the **Size** box in a reinforcement object's properties, or in a component dialog box.
2. Browse or search for the definitions to which you want to add stars.
3. In the definition list, click the white star symbol in the **Star** column for each definition that you want to add to the **Starred** group.

By default, the **Star** column is the first column and the star symbol is at the beginning of each definition row.



The star symbol turns yellow and the definition is added to the **Starred** group.

To remove a definition from the **Starred** group, click the yellow star symbol on the definition row. The star symbol turns white again.

Add tags to rebar definitions

In the **Rebar catalog** dialog box, you can add tags to rebar definition to add keywords or other metadata the definitions.

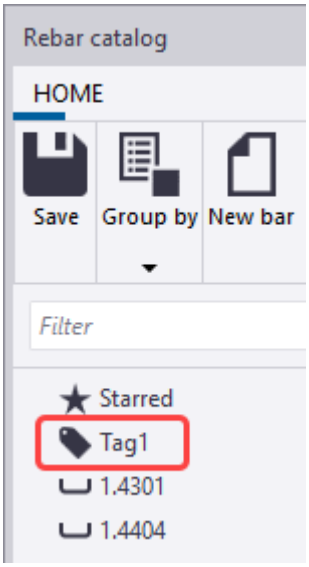
For example, you could use tags like `Stainless` and `Acid proof`.

Tags are model-specific and saved to the `rebar_catalog.settings` file in the current model folder.

1. On the **File** menu, click **Catalogs** --> **Rebar catalog** to open the **Rebar catalog** dialog box.
2. Select the definitions that you want to tag.
3. Enter the tag in the **Tags** box at the bottom-right corner of the **Rebar catalog** dialog box, and then press **Enter**.

   To add several tags to a definition, enter the next tag in the next tag box and press **Enter**.

   Each group of tagged definitions appears with the symbol in the list of groups, after the **Starred** group:



4. Click  **Save** to save the changes to the rebar catalog.

Remove tags from rebar definitions or delete tags
You can remove tags from rebar definitions or delete tags when they are no longer needed.

1. On the **File** menu, click **Catalogs** --> **Rebar catalog** to open the **Rebar catalog** dialog box.
2. Remove or delete tags.
   - To remove a tag from a definition, select the definition and click the **X** symbol after the tag name in the **Tags** section in the property area.
   - To delete a tag completely, select the tagged group, select all the definitions in the group, and then click the **X** symbol after the tag name in the **Tags** section in the property area.
3. Click  **Save** to save the changes to the rebar catalog.

Customize the Applications & components catalog

You can modify the catalog definition settings of the **Applications & components** catalog using catalog definition files, and set up a group structure to suit the needs of your company.

Always check the settings and the group structure when upgrading to a new Tekla Structures version.

Catalog definition files (`ComponentCatalog.xml`) can be located in folders that are defined by the XS_SYSTEM, XS_FIRM, and XS_PROJECT advanced options, and in the model folder. If there are several catalog definition files, Tekla Structures combines the information in the files. For more information about the folder search order, see Folder search order (page 45).

When you create a group structure for the **Applications & components** catalog, define the highest level structure in a catalog definition file that is located in a folder that is defined by the XS_SYSTEM advanced option. To hide unnecessary parts of the group structure and catalog content from certain roles, edit the catalog definition files of these roles.

You can also add your own instructor side pane help pages (page 345) for the tools in the **Applications & components** catalog.

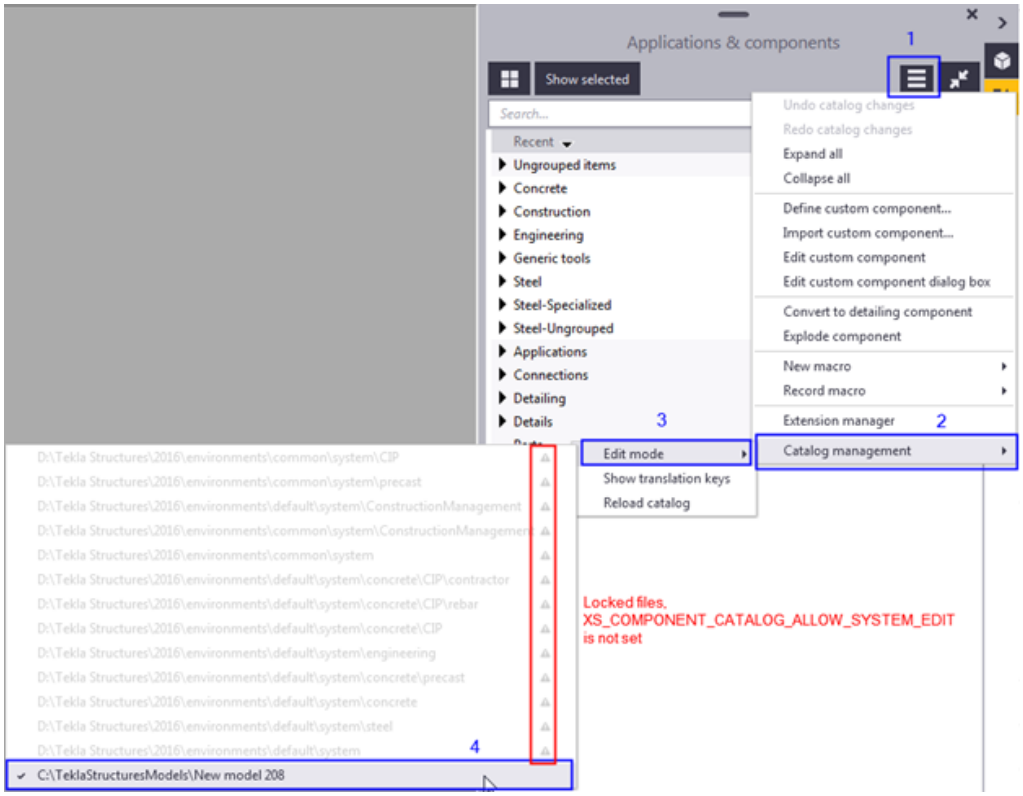
Edit the Applications & components catalog

1. To edit the catalog definition files, set the XS_COMPONENT_CATALOG_ALLOW_SYSTEM_EDIT advanced option to `TRUE`.

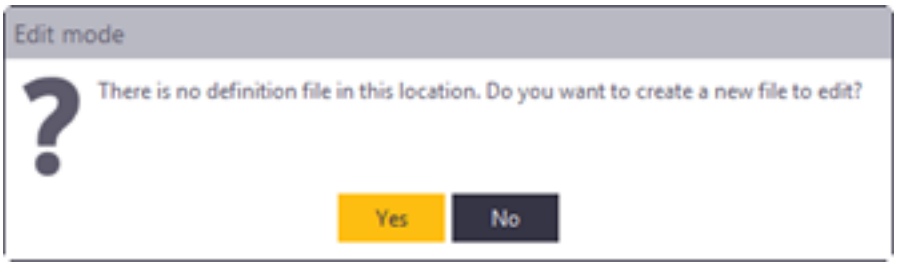
2. In the **Applications & components** catalog, click **Access advanced features** --> **Catalog management** --> **Edit mode**, then select the catalog definition file that you want to edit.

   The list of files shows all the environment folders, the project and firm folders if defined, and the model folder. You can define the catalog definition file folder paths in `XS_SYSTEM`.

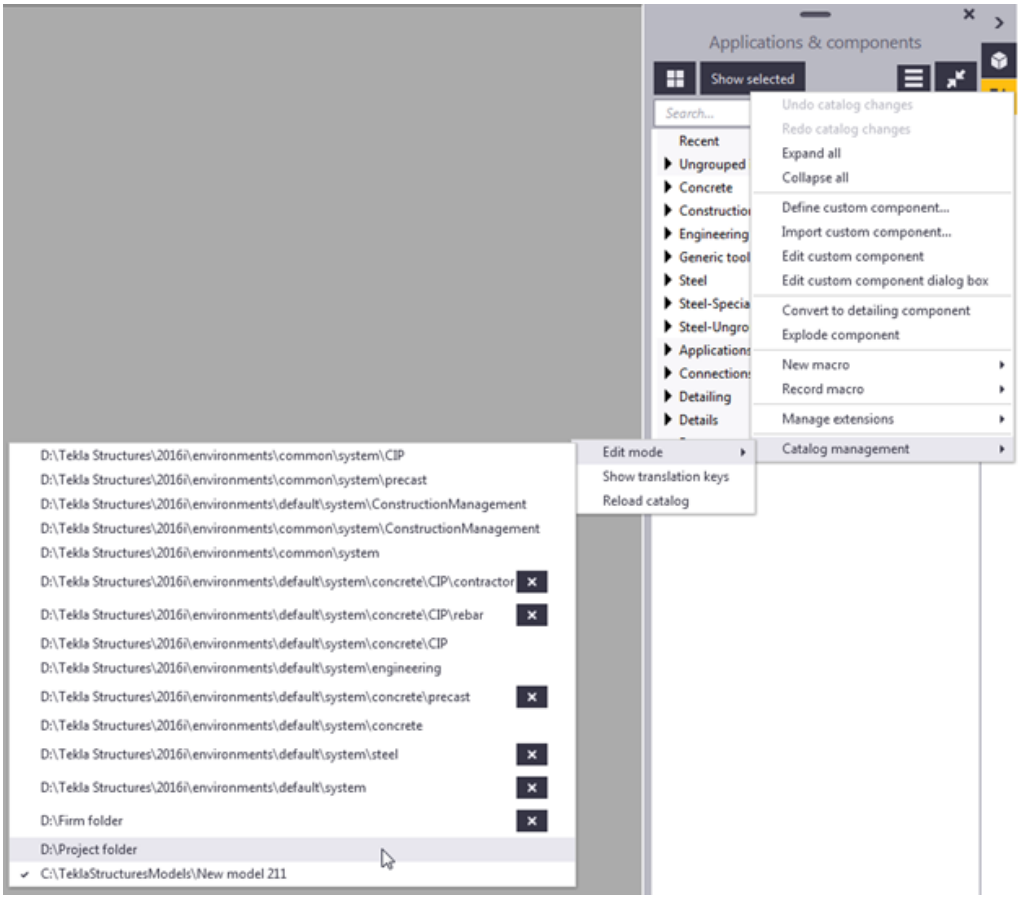
   If `XS_COMPONENT_CATALOG_ALLOW_SYSTEM_EDIT` is not set to `TRUE`, a small warning icon is shown next to the files in the `XS_SYSTEM` folder locations. The image shows warning icons next to the files that appear dimmed.



   Files that appear dimmed do not exist, but you can create the files by selecting them, and clicking **Yes** in the **Edit mode** message box.

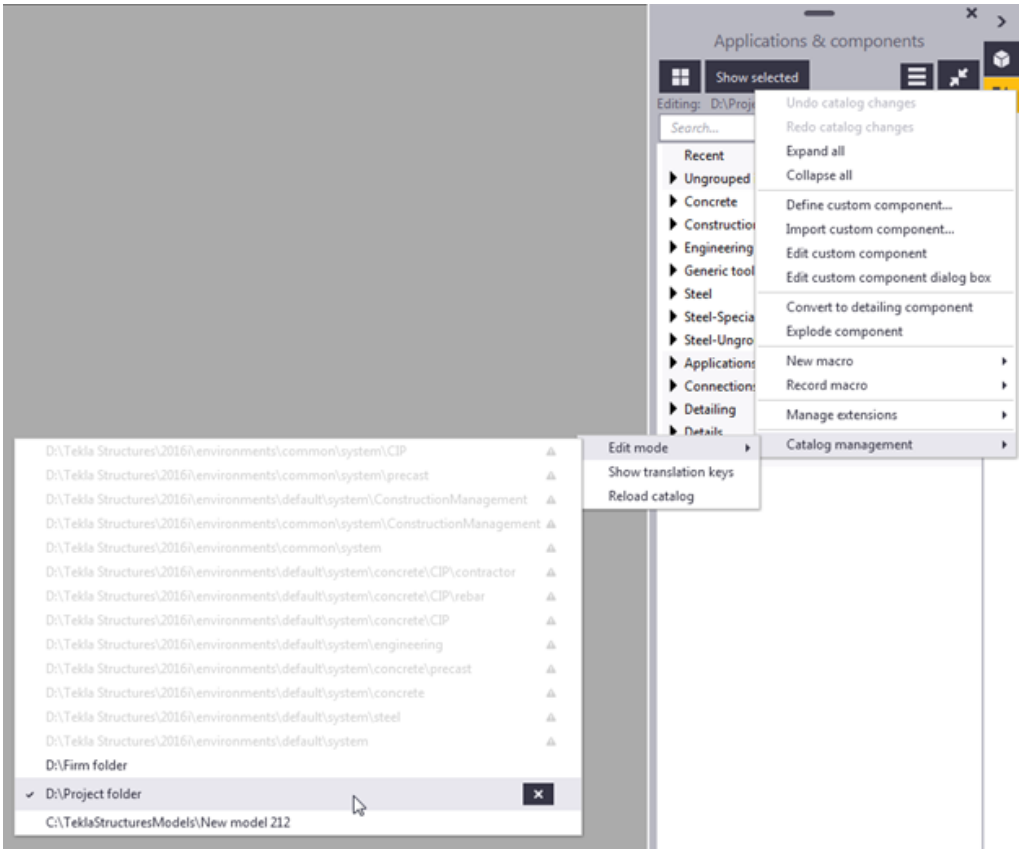


You can remove an existing file by clicking the button next to the file.



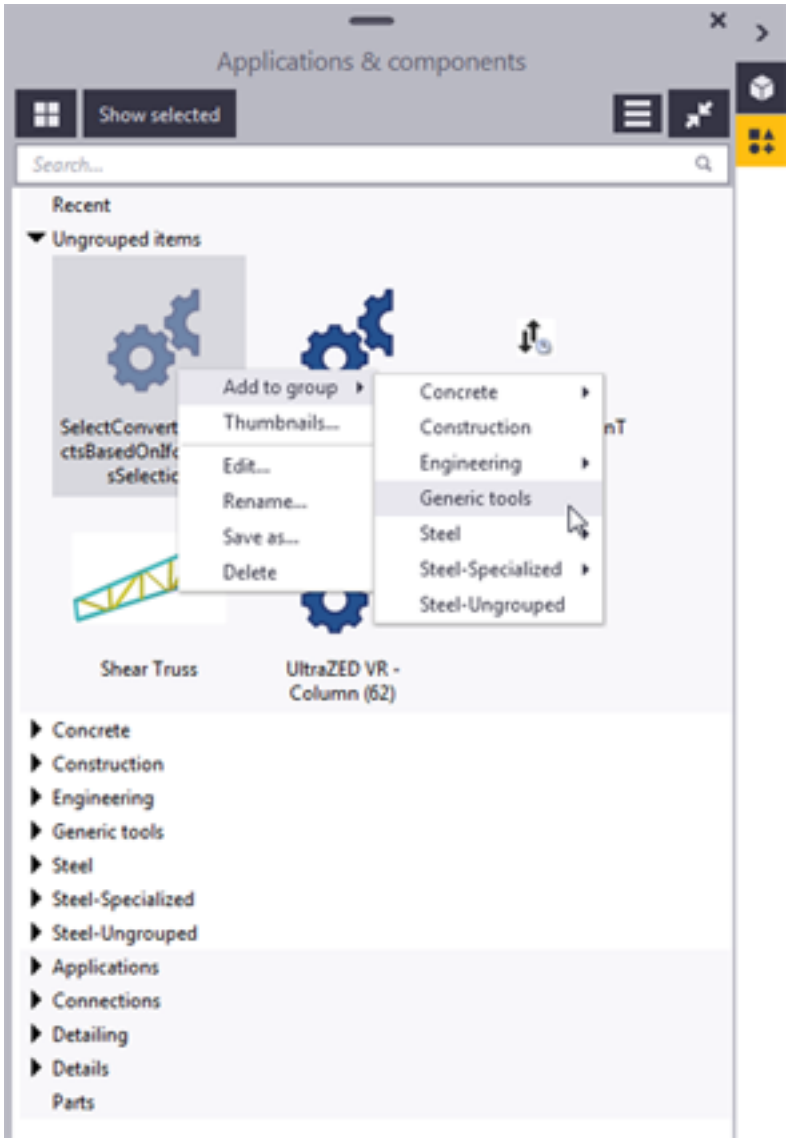
3. Select the file that you want to edit.

The check mark in front of the folder name shows the file that is currently being edited.



4. Create new groups and subgroups to organize the catalog content, right-click in the catalog and select **New group...**.
5. Move the content from **Ungrouped items** to the new groups, or to other predefined custom groups.

To move an item to another group, right-click the item, select **Add to group**, then select the target group.

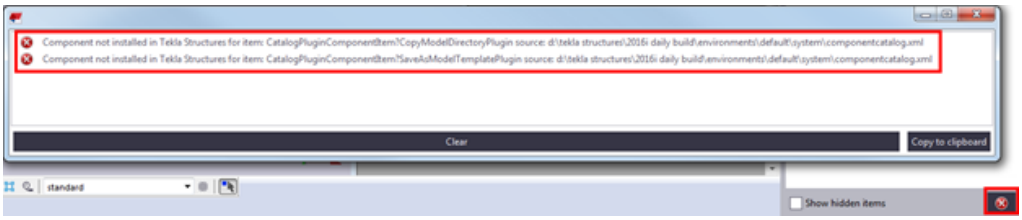


It is important to keep the **Ungrouped items** group empty because all items downloaded from Tekla Warehouse are placed in that group. When you place an item to a predefined group, it is automatically removed from the ungrouped items.

Maintain the Applications & components catalog

To keep the **Applications & components** catalog structure and content clear and in order, keep the groups up to date and organized, and remove the unnecessary items from the catalog definition files.

1. Click  in the bottom-right corner in the **Applications & components** catalog to display the message log:



If an item defined in a catalog definition file is removed from the Tekla Structures software, the removed item will be included in the **Applications & components** catalog error message log.

2. If the log contains references to missing items, edit the relevant `ComponentCatalog.xml` file to remove the references manually.

   We recommend that you make a back-up copy of the file before you start editing.


```
<ComponentCatalogItemPlaceholder>
  <ItemIdString>CatalogMacroModelingItem?CreateSurfaceView?GLOBAL</ItemIdString>
</ComponentCatalogItemPlaceholder>
<ComponentCatalogItemPlaceholder>
  <ItemIdString>CatalogPluginComponentItem?CopyModelDirectoryPlugin</ItemIdString>
</ComponentCatalogItemPlaceholder>
<ComponentCatalogItemPlaceholder>
  <ItemIdString>CatalogMacroModelingItem?CloseViewsExceptSelected?GLOBAL</ItemIdString>
</ComponentCatalogItemPlaceholder>
<ComponentCatalogItemPlaceholder>
  <ItemIdString>CatalogMacroModelingItem?CloseTemporaryViews?GLOBAL</ItemIdString>
```

3. Thoroughly test that these changes do not create any further errors, or cause problems in the group structure in the **Applications & components** catalog.

   Check at least the **Ungrouped items** and **Legacy catalog** groups.

4. If there are new items in the group, move them from the **Ungrouped items** group to the appropriate predefined groups, and hide them from specific roles, if needed.

5. Add suitable thumbnails to the items, if needed.

Create your own component folder

Usually, only a few different connections and components are used in a project. To ensure that everyone in the project uses the same components and finds the components faster, we recommend that you create your own component folder.

TIP In the **Applications & components** catalog, use the commands in **Access advanced features** > **Catalog management** to modify catalog definitions.

---

1. Click the **Applications & components** button in the side pane to open the **Applications & components** catalog.

2. To create a new group for the project, right-click in the catalog, then select **New group**.
3. Add components to the group.
   a. Select the components in the catalog, right-click, then select **Add to group**.
   b. Select the group to which you want to add the components.

      You can also drag the selected components to another group.
4. To hide the groups that you do not need, select the group, right-click, then select **Hide/Unhide**.

Troubleshooting components or groups in the Applications & components catalog

If a component or group in the **Applications & components** catalog is not working as expected, you can generate a troubleshooting dump file that shows the data used to construct the component or group.

1. In the **Applications & components** catalog, click  **Access advanced features** --> **Catalog management** --> **Show dump command for selected component or group**.
2. In the catalog, select the component or group, then right-click and select **Dump troubleshooting data**.
3. In the dialog box that opens, select the target file path and enter the file name, then click **Save** to save the file.

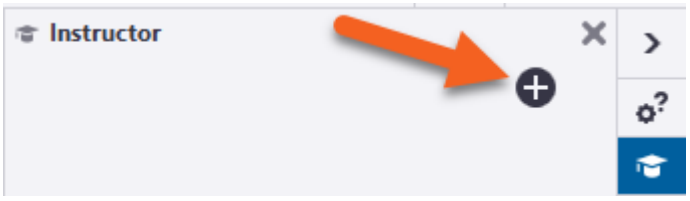
   By default, the file is stored in the `\local\temp` folder for the model.

Add instructor help for applications and components

You can easily create side pane help for tools in the **Applications & components** catalog.

In the **Applications & components** catalog, the **Instructor** shows content when you select an item, so the information is especially useful for giving advice to your users on choosing between different components or giving instructions before running a tool. To make full use of this feature, users should arrange their side panes so that both panes are visible.

1. Select the tool you want to add help for in the **Applications & components** catalog.
2. Click the **Add help files** button in the **Instructor** pane.



A dialog box opens for creating the necessary files according to your selections.

3. Click **Next** and select the languages that are used as user interface languages in your organization. There needs to be a content file for each language even if you do not translate the content.
4. Click **Next** and select the folder where you want to store the generated files. The files can be stored in the model, project, firm, or system folder. The standard folder search order (page 45) is followed.
5. Click **Create**.

   Tekla Structures creates an XML file that defines a link between the tool in the **Applications & components** catalog and an HTML file for the help content.

   The HTML files are stored in a folder structure that separates files into language-specific folders. The XML file and the root folder for the content are named according to the identifier of the tool you are documenting. You can copy files between the allowed storage locations, but do not rename the files or folders or change the folder structure.
6. Edit the HTML content file(s) in your preferred tool, such as a text editor, or replace the file with your own HTML file of the same name. If you do not have any HTML editing experience, there are several good tutorials available on the internet to quickly learn the few basics you need to know. You can create your own HTML files by saving as HTML from familiar tools, such as Microsoft Word or Google Docs. Note that the resulting files will not look exactly the same as the original document.

4.9 Create start-up shortcuts with customized initializations

To use the correct `.ini` files for a specific project, you can create shortcuts to start `teklastructures.exe` with customized initializations.

You can use this functionality to create shortcuts for different purposes, for example, to have customized setup files depending on the client you are

working for in a project. The Tekla Structures installation automatically creates shortcuts for the selected environments.

NOTE We recommend that only administrators create the customization and the necessary shortcuts. Otherwise, your settings may differ from the settings defined for your firm, or for the particular project you are working for.

For more information about initialization files (`.ini` files), see initialization files (files) (page 48).

Create a start-up shortcut with customized initialization

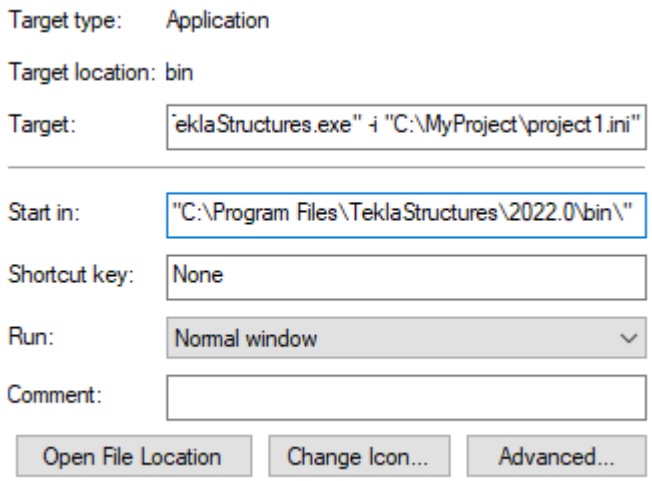
1. Create a customized initialization file.
   a. Open the `user.ini` file using any standard text editor.

      The `user.ini` file is located in `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UserSettings` on your computer.

   b. Save the file with a new name, such as `customer.ini` or `project.ini`.

   c. Add the required settings to the file, then save the modified initialization file.
2. To make a copy of the default shortcut, right-click **Tekla Structures <version>** shortcut on your desktop, select **Copy**, then paste the shortcut to your desktop.
3. Right-click the shortcut, then select **Properties**.
4. In the **Target** field, enter the path to the current `teklastructures.exe`, then the project initialization parameters.

If the path contains spaces, use quotation marks (") around the path. For example, `"C:\Program Files\Tekla Structures\"`



TIP The maximum length of a shortcut is 256 characters. If your shortcut is too long, you can call all other necessary initialization files from your customized initialization file instead of adding them to the shortcut.

5. To override the settings defined in the shortcuts, use the parameter `-i <initialization_file>` in the `user.ini` and `option.ini` files.

Available parameters in shortcuts

You can use these parameters in start-up shortcuts.

You can use the parameters in combinations. For example, you can set the parameters to automatically bypass the **Tekla Structures - Choose setup** dialog box, open a model, and run a macro.

Parameter	Description
`-I <ini_file_path>`	The given `.ini` file is **loaded before** the environment `.ini` files. This parameter can be specified multiple times. This parameter can be used to bypass the **Tekla Structures - Choose setup** dialog (the login dialog). Example: `"C:\Program Files\Tekla Structures\<version>\bin\TeklaStructures.exe" -I "C:\ProgramData\Trimble\Tekla Structures\<version>\Environments\uk\Bypass.ini"`

Parameter	Description
`-i <ini_file_path>`	The given `.ini` file is **loaded after** the role `.ini` files. This parameter can be specified multiple times. Example: `"C:\Program Files\Tekla Structures\<version>\bin\TeklaStructures.exe" -i "C:\TeklaStructures\MySettings.ini"`
To open an existing model `<model_path>`	The given model is opened after start-up. Example: `"C:\Program Files\Tekla Structures\<version>\bin\TeklaStructures.exe" "C:\TeklaStructuresModels\My model"`
To open an existing, autosaved model `<model_path> /autosaved`	The given autosaved model is opened after start-up. Example: `"C:\Program Files\Tekla Structures\<version>\bin\TeklaStructures.exe""C:\TeklaStructuresModels\My model" /autosaved`
To create a new model without a model template `/create:<model_path>`	A new model is created after start-up. Example: `"C:\Program Files\Tekla Structures\<version>\bin\TeklaStructures.exe"/create:"C:\TeklaStructuresModels\My model"`
To create a new model using a model template `/create:<model_path> /modelTemplate:<template_name>`	A new model using a model template is created after start-up. Example: `"C:\Program Files\Tekla Structures\<version>\bin\TeklaStructures.exe"/create:"C:\TeklaStructuresModels\My model" /modelTemplate:"Cast-in-Place"`
To create a new multi-user model `/create:<model_path> /server:<server_name>`	A new multi-user model is created after start-up. Example: `"C:\Program Files\Tekla Structures\<version>\bin\TeklaStructures.exe"/create:"C:\TeklaStructuresModels\My model" /server:"my-server:1234"`

Parameter	Description
To run a macro after start-up `-m <macro_file_path>`	The given macro is executed after start-up. The example below opens Tekla Structures, sets the environment, role and configuration from the `Bypass.ini` file, opens the model, and reads in and saves the model by using the **Example Macro: Model Sharing Read in and Save** from the **BIM Publisher** tool that is available in Tekla Warehouse. `"C:\Program Files\Tekla Structures\<version>\bin\TeklaStructures.exe" -I "C:\ProgramData\Trimble\Tekla Structures\<version>\Environments\<environment>\Bypass.ini" "C:\TeklaStructuresModels\<model>" -m "C:\ReadInSave2016.cs"`

Example of an initialization file

This example shows a customized project initialization file that calls other initialization files.

```
MyProject.ini
//The project is based on the default UK settings
call C:\ProgramData\Trimble\Tekla Structures\2019.0\Environments\uk
\env_UK.ini
//..but our company policy requires these changes
call c:\CompanySettings\OurPolicy.ini
//..and the fabricator requires something
call c:\Fabricators\Fabricator1.ini
//..and then we let users to make some changes (color etc.)
call c:\Users\user_%USERNAME%.ini
```

The project shortcut for this initialization file:

```
"C:\Program Files\Tekla Structures\<version>\bin\TeklaStructures.exe" -i
"\\MyServer\MyProject\MyProject.ini" "\\MyServer\MyProject\MyModel\"
```

Bypass the sign in dialog box

You can bypass the sign in dialog box by creating a start-up shortcut that uses a customized `Bypass.ini` file.

1. In a text editor, open an existing `Bypass.ini` file.

   You can find the `Bypass.ini` file for each environment in the `%XSDATADIR%\Environments\<your environment>` folder.

2. Set the following advanced options in the customized `Bypass.ini` file:

   - XS_LICENSE_SERVER_HOST: the on-premises license server address. To use Tekla Structures subscriptions, set the value to `https`.

- XS_DEFAULT_LICENSE: the default subscription or license for a user role.
- XS_DEFAULT_ENVIRONMENT: the environment-specific `.ini` file, for example `%XSDATADIR%\Environments\uk\env_UK.ini`
- XS_DEFAULT_ROLE: the role-specific `.ini` file, for example `%XSDATADIR%\Environments\uk\role_Engineer.ini`

For example:

```
set XS_LICENSE_SERVER_HOST=https
set XS_DEFAULT_LICENSE=DIAMOND
set XS_DEFAULT_ENVIRONMENT=%XSDATADIR%\Environments\uk\env_UK.ini
set XS_DEFAULT_ROLE=%XSDATADIR%\Environments\uk\role_Engineer.ini
```

3. Save the modified `Bypass.ini` file.
4. Right-click **Tekla Structures <version>** shortcut on your desktop, then select **Copy**.
5. Paste the shortcut to your desktop.
6. Right-click the new shortcut, then select **Properties**.
7. In the **Target** field, enter the path to `teklastructures.exe`, followed by the parameter `-I` (capital i) , then the path to the `Bypass.ini` file.

   If you have installed Tekla Structures in a path that contains spaces, use quotation marks (") around each path.

   An example of the modified target:

```
"C:\Program Files\Tekla Structures\2022\bin\TeklaStructures.exe" -I
"C:\ProgramData\Tekla Structures\2022\Environments\uk\Bypass.ini"
```

5 Daily management of Tekla Structures

These tasks are often needed in the day-to-day management of Tekla Structures.

- Manage the users in your organization for Tekla Online services (page 352).
- Manage access to Tekla Structures subscriptions (page 353) for users in your organization.
- If you have legacy on-premises licenses (page 353), maintain license servers and manage licenses for users.
- Install service packs or new Tekla Structures versions to upgrade Tekla Structures (page 441).
- Manage printer settings (page 441).

5.1 Management of the organization for Tekla Online services

Each organization has at least one administrator who is responsible for managing the Tekla Online organization (group) used in Tekla Online services.

Several people in your company can be Tekla Online organization administrators. The first user is invited by a Trimble representative, and that person is then responsible for adding other users and administrators as necessary.

As a Tekla Online organization administrator, you:

- Invite or approve employees to your company's Tekla Online organization to allow them unrestricted access in all Tekla Online services.
- Add external license users.
- Select who has access to your company's Tekla Structures subscriptions.

- Remove people from your company's employee group when they no longer belong to your company.

For more information, see Manage user accounts for Tekla products.

5.2 Management of Tekla Structures subscriptions

Tekla Structures subscriptions are the default licensing option for Tekla Structures and the Tekla Model Sharing feature.

As a Tekla Structures administrator, you activate subscriptions for each user's Trimble Identity, after which the user is able to select a license when they log in to Tekla Structures. Administrator users can monitor subscription usage and contract manager users can manage subscription renewals in the Tekla Online Admin Tool.

After the Tekla Online subscription is set up, you can verify that you have the correct number of licenses and that the licenses are used correctly.

You can monitor both current subscription users and view statistics about past usage in the Tekla Online Admin Tool.

If users are selecting incorrect license types or secondary users are reserving too many licenses, you can ensure that the correct types of licenses are available to the users who most need them by defining access rights for using licenses. You can adjust access rights for subscriptions in the Tekla Online Admin Tool.

For instructions, see Manage Tekla Structures subscriptions.

5.3 Legacy on-premises licensing for Tekla Structures

On-premises licenses are a legacy licensing option for Tekla Structures.

The information on this page is not valid for Tekla subscriptions.

On-premises licenses are licenses that you activate locally on a license server that you install on your own hardware. Users connect to your local license server to reserve a license.

Working with on-premises licenses

To get started with legacy on-premises license administration:

1. Make sure that you understand how licensing works, see Tekla Structures legacy on-premises licensing for administrators (page 354).

2. Install the license server as explained in Installing Tekla on-premises license server (page 369).
3. Make sure the license server can connect to Trimble's activation server and clients can connect to the license server, see Allowing Tekla on-premises license server to operate through Windows Firewall (page 380).
4. Activate your licenses on the server as explained in Activate on-premises licenses (page 390).
5. Test that licensing works and connect the clients to the license server as explained in Preconfigure license server settings for users (page 379).

Additionally, you can ensure that the correct types of on-premises licenses are available to the users who most need them by defining access rights for using and borrowing licenses as explained in Modify on-premises license access rights (tekla.opt) (page 397). This can prevent situations where there are no licenses available for users that need them because someone else has reserved or borrowed a license that they do not really need.

When you renew on-premises licenses and when you need to make hardware changes on the license server, you must deactivate your licenses as explained in Deactivate on-premises licenses (page 394).

If your on-premises licenses have become untrusted or disabled, they cannot be used and you need to repair them. For information about how to do this, see Repair an on-premises license (page 403).

Tekla Structures legacy on-premises licensing for administrators

The information on this page is not valid for Tekla subscriptions.

Legacy on-premises licenses are an alternative to the default Tekla Structures subscription. The type of subscription or license is determined when you purchase a license, so you cannot change between on-premises licenses and subscriptions yourself. You activate on-premises licenses on a license server that you install on your own computer hardware. Tekla Structures installations for one or more users connect to the license server to reserve a license.

Legacy on-premises licensing technology

With legacy on-premises licensing, Tekla Structures uses FlexNet (FlexNet Publisher License Management) licensing system by Flexera Software. We provide our own Tekla-specific tools for managing the licenses on top of the common FlexNet platform, replacing some of the standard tools that you might have encountered when using other software products that use FlexNet for licensing.

The license server software is compatible with several versions of Tekla Structures. To see which license server version to use with your current Tekla Structures version, see Hardware recommendations for Tekla license server.

The licenses are also compatible with older versions of Tekla Structures in addition to the highest allowed version stated in the license. The license is sent to you attached in an email as an entitlement certificate HTML file.

NOTE Keep backup copies of your license entitlements in a safe place.

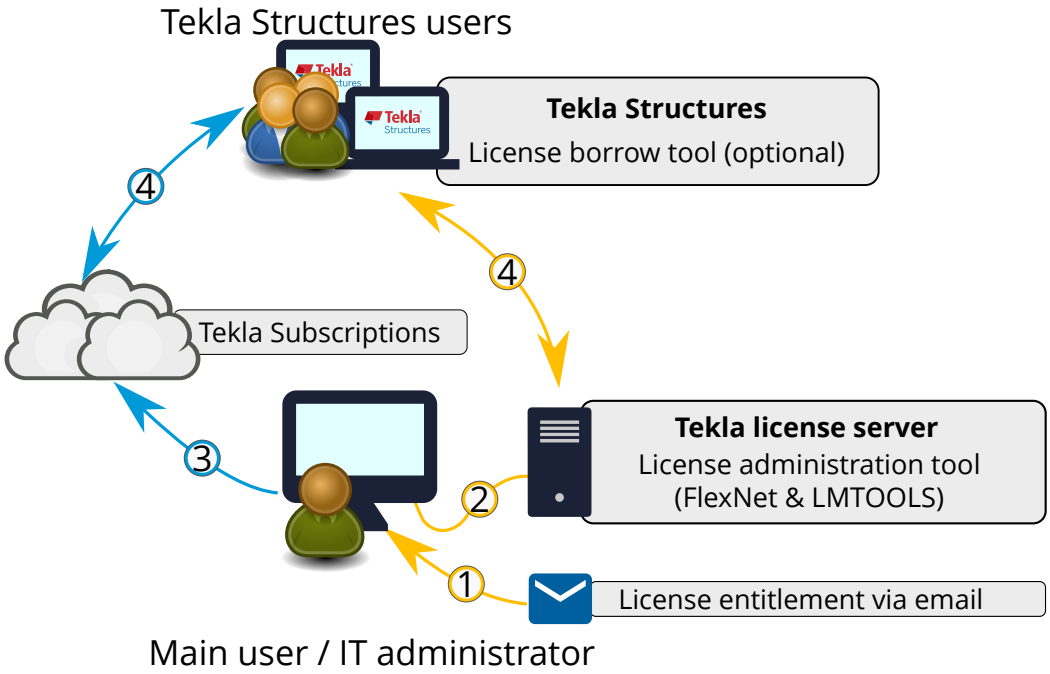
Local licensing on your workstation

If there are few users in your organization and you do not need to share the same licenses between users, you can install a license server directly on each Tekla Structures workstation. When you activate a license on the local license server, Tekla Structures always uses that license and you can also start Tekla Structures offline without borrowing a license. For more information, see Installation and licensing workflow.

For organizations with many users, it is not optimal to install and manage a license server on each workstation because of the extra work involved, lack of visibility and inability to flexibly share licenses between users. In this situation, it is better to set up a central license server in your internal network.

License server in your local area network (floating licenses)

This illustration shows how licensing works in a typical corporate setup where licenses are activated on a centrally-managed license server, and a mix of on-premises licenses and Tekla Structures subscriptions is used.



1. An administrator (main user or IT administrator) receives entitlement certificates for new and updated FlexNet licenses as email attachments.

2. The administrator activates and manages the FlexNet licenses in the Tekla License Administration Tool on the license server installed at your organization.

   For successful activation, the system must be able to contact Trimble's license activation service.

3. The administrator adds users to your organization and allows access to your purchased Tekla Structures subscriptions in the Tekla Online Admin tool.

   Exception: educational users must get their free Tekla Student subscription themselves at the Tekla Campus site.

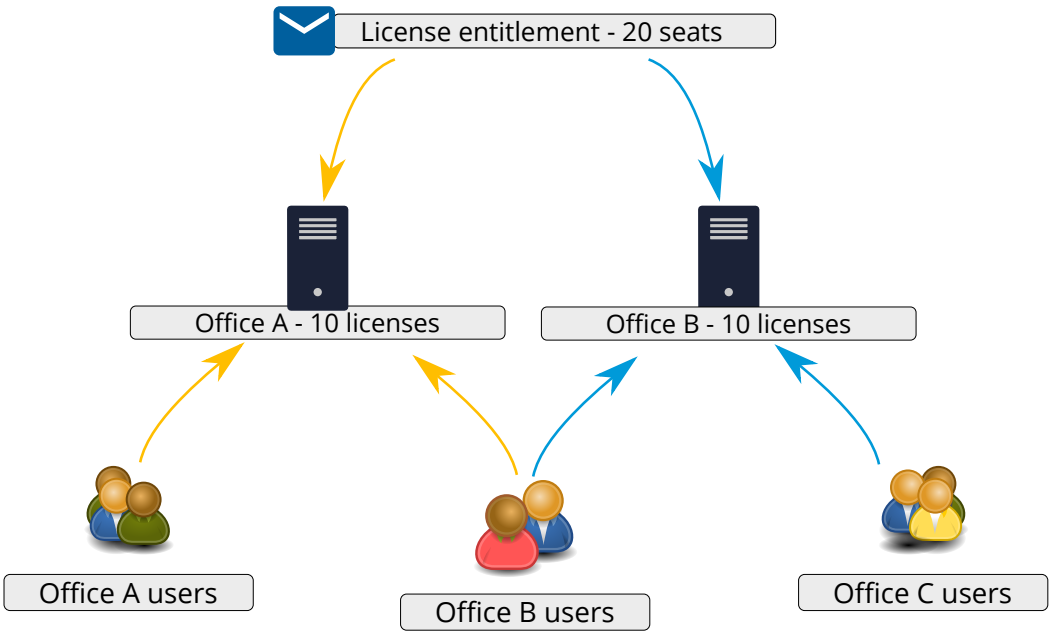
4. Tekla Structures installations on the end-users' workstations reserve a license on the license server or in the cloud when a user starts Tekla Structures or joins Tekla Model Sharing. When the user stops using Tekla Structures, the license reservation is revoked.

   - You can optionally allow users to borrow licenses for a set period of time, which allows the user to start Tekla Structures without network access to the license server. To borrow a license, the user must have the license borrow tool installed on their workstation.
   - Tekla Structures subscriptions cannot be borrowed. Users must have internet access to start Tekla Structures with a subscription. For more information about subscriptions, see Manage Tekla subscriptions.

Tekla Structures holds licenses in trusted storage. This means that Tekla Structures does not support three-server redundancy, where licenses are held in license files. However, you can have any number of license servers, and use search paths for defining and finding them.

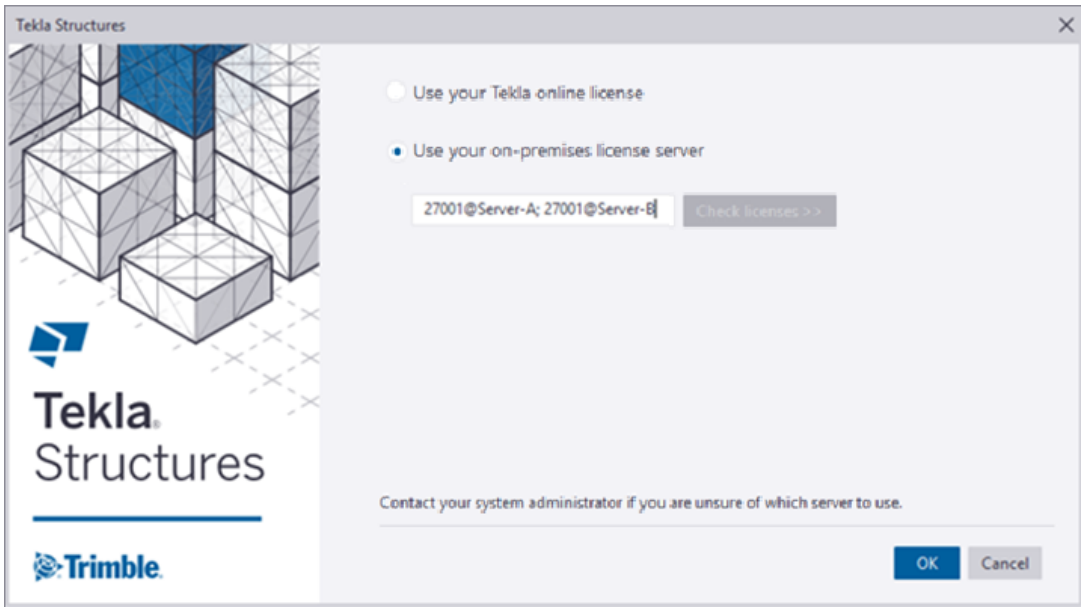
Using multiple license servers in one company

You might want to spread your license pool on several servers in your company. You might have offices in many cities, each office with its own license server, or you might simply want to divide the license pool to minimize disruption caused by server downtime.



You do not have to activate all of the licenses on the same license server even if they are on the same entitlement certificate. For example, you can divide your total license entitlement on several servers simply by activating one half of your licenses on one server and the other half of the licenses on another server. Or, as another example, you can activate some of the licenses on a common server and the rest locally on each user's computer. You can easily change the location of the licenses by deactivating them on one license server and activating on another so you can adjust the number of licenses to changes in your user base over time.

In Tekla Structures, you can define two server addresses separated by a semicolon (;). This way, if there is a maintenance break on one of the servers, users can obtain the license from the other server.



NOTE Defining several license servers can slow down the starting of Tekla Structures. Therefore, we do not recommend defining more than two servers.

License server hardware

The Tekla license server does not need high performance hardware. However, it is important to ensure that the network connection and server hardware are reliable, and to maintain the server system carefully.

NOTE **Deactivate your licenses** before you make changes to the hardware or perform a major operating system upgrade on the license server computer. Keep copies of your license entitlement certificate(s) in a safe place in case something goes wrong, so that you can easily and quickly activate the deactivated licenses on a different system. You can only activate the same licenses again if they have first been deactivated on the previous system. If the license server system becomes permanently inoperable with the licenses still activated, contact your local Tekla support for assistance.

See Tekla license server hardware recommendations for information about operating systems and virtual machine platforms.

Configuration features for on-premises licenses

You have fine-grained control over the license use:

- You can control license use based on the license type (enterprise/domestic) or Tekla Structures configuration.
- You can define minimum and maximum numbers of licenses users/user groups have available.

- You can allow or prevent license borrowing from named users/user groups.

The configurations can be done based on host addresses, individual user names or by user groups. See Modify on-premises license access rights (tekla.opt) (page 397) for more information.

Checklists for on-premises licensing implementation

There are several prerequisites the administrator needs to take into account before starting with FlexNet licensing. Take a look at the following listings:

- Checklist of Trimble deliverables needed in on-premises licensing (page 359)
- Checklist of IT resources needed in on-premises licensing (page 360)
- Checklist for the on-premises license server administrator (page 361)
- Rights needed for administrator tasks in on-premises licensing (page 362)

Additional information sources

In addition to Tekla Structures specific documentation, you can find useful information about the FlexNet system in the documents provided with the installation and in Tekla Downloads. The following **FlexNet License Administration Guides** by Flexera Software are generic guides that contain, for example, instructions on how to create user groups and manage access rights:

- `C:\Tekla\License\Server\fnp_LicAdmin.pdf`
- `C:\Tekla\License\Server\LicenseAdministration.pdf`

See also

Distribution and management of on-premises licenses (page 362)

Examples of different on-premises licensing setups (page 364)

Installing Tekla on-premises license server (page 369)

Checklist of Trimble deliverables needed in on-premises licensing

The information on this page is not valid for Tekla subscriptions.

To get started with the Tekla Structures on-premises FlexNet licensing, the administrator needs to have the following items provided by Trimble:

- **Entitlement certificate**

  Trimble has sent the license entitlement certificate in an e-mail to the person in your organization who has made the license purchase, or to someone named as the contact person. The entitlement certificate lists all the Tekla Structures licenses you are entitled to use and includes the activation IDs for entitled licenses.

  For entitlement requests, contact your local Tekla representative.

- **Tekla license server installation package**

  The Tekla license server installation package is available on Tekla Downloads product download service. The installation package contains the license server files and Tekla License Administration Tool.

- **License Administration Guide**

  This guide by Flexera Software is a general guide that contains, for example, instructions on how to create user groups and manage access rights. This guide is provided in the license server installation package and is installed in the folder where you install the license server in the `.pdf` format.

Checklist of IT resources needed in on-premises licensing

The information on this page is not valid for Tekla subscriptions.

In Tekla Structures on-premises licensing, you need to install the licensing tools on your own hardware, taking into account the following IT resource related requirements:

- **Supported operating system**

  The FlexNet licensing system for Tekla Structures runs in Windows operating system. The support for virtual servers is limited. For more information, see Tekla Structures Hardware recommendations in Tekla User Assistance.

- **Windows user account with administrator rights**

  Your Windows login user name should not contain any special characters.

  You need to have administrator rights to install and manage the license server. For more information, see Rights needed for administrator tasks in on-premises licensing (page 362).

- **TCP/IP port 27007 for license server**

  Tekla licensing service (`lmgrd`) is automatically run in the TCP/IP port 27007. This port should be dedicated for Tekla licensing service only. If required, you can manually set a different TCP/IP port for the licensing service, see Modify the license file tekla.lic manually (page 375).

- **Local area network**

  The license server and the client computers need to be in the same local area network. The clients need to be able to contact the license server. If there is no local area network in your company, we recommend that you install the license server on each computer that has Tekla Structures and activate one license on each computer.

- **Internal firewall and direct communication**

  The internal firewall of your company (for example, Windows Firewall) must allow the communication between the server computer and the computers

with Tekla Structures. You must allow the applications `tekla.exe` and `lmgrd.exe` to operate through the firewall. For more information, see Allowing Tekla on-premises license server to operate through Windows Firewall (page 380).

Direct communication from the server computer to the Internet needs to be allowed when the license server at your company contacts the activation server at Trimble Solutions. The activation communication uses SOAP over HTTPS on the TCP/IP port 443.

Your firewall should not block any incoming or outgoing information during the activation. To allow the activation communication, use the activation server address in your firewall settings:

https://activate.tekla.com:443/flexnet/services/ActivationService?wsdl

If direct communication from the server computer to the Internet is not allowed, contact your local Tekla Structures support for manual activation.

- **System backup settings**

  If you have an automatic backup and restore system in your company, configure your system so that it does not overwrite your actual Trusted Storage with the backup copy. Trusted Storage is the place where the licensing information is stored on the server computer, and it is located in `C:\ProgramData\FLEXnet` depending on the operating system.

Checklist for the on-premises license server administrator

The information on this page is not valid for Tekla subscriptions.

Your company or organization should assign an administrator for the Tekla Structures on-premises license server. The license server administrator's primary responsibilities are:

- Install the Tekla license server: Installing Tekla on-premises license server (page 369)
- If automatic installation is not possible, manually install and configure Tekla license server: Install Tekla license server - manual installation (page 372), Configure Tekla license server manually (page 377), Modify the license file tekla.lic manually (page 375)
- Save the entitlement certificate on the license server computer and activate licenses on the server to make the licenses available for Tekla Structures users, or for yourself, if the license server is installed on your own computer: Activate on-premises licenses (page 390)
- Inform users of the license server name and port number so that they can connect Tekla Structures to the server: Preconfigure license server settings for users (page 379)

- If necessary, modify the firewall settings to allow licensing traffic: Allowing Tekla on-premises license server to operate through Windows Firewall (page 380)
- If necessary, modify license access rights in the `tekla.opt` options file: Modify on-premises license access rights (tekla.opt) (page 397)
- Export a customized product ID files for license borrowing and deliver them to offline users: Provide offline users with a customized product ID file (page 406)
- Inform users of the license policy of the company and monitor license use.

Rights needed for administrator tasks in on-premises licensing

The information on this page is not valid for Tekla subscriptions.

You need to have Windows administrator rights to install and manage the Tekla Structures on-premises license server. Some applications also need to be run as administrator separately. This depends on the Windows version you are using.

- In **Windows 7**, **Windows 8/8.1** and **Windows 10**, you need to log in as administrator. In some cases, you need to run applications as administrator. To do this, go to the folder containing the application, right-click the application and select **Run as administrator** from the pop-up menu.
- In **Windows Server** you need to log in as administrator. In some cases, you need to run applications with *unrestricted rights*. To do this, right-click the application, select **Run as**, and clear the **Run this program with restricted access** check box.

Distribution and management of on-premises licenses

The information on this page is not valid for Tekla subscriptions.

The Tekla Structures FlexNet licensing system offers several options for distributing on-premises licenses to users. The way you distribute the licenses depends on the size of the company or organization, and the amount of Tekla Structures users.

There are two basic ways of distributing on-premises licenses to users:

- The licenses are available for multiple users on a common license server.
- The licenses are activated on each user's own computer.

You can also use a combination of license distribution methods. For example, you can activate one license on a separate computer and activate the rest of your licenses on a common license server.

You can also use subscriptions together with on-premises licenses. Users can change between the two licensing methods when they start Tekla Structures. For example, users can use an on-premises license at the office, but change to a subscription when they are outside the office when they are mostly within reach of the internet. Using a subscription eliminates the need to borrow licenses or connect to the office through VPN just to reserve a license.

The following table shows what is typical for managing the licenses that are activated separately on each computer, and for licenses that are activated on a common license server.

Licenses are activated on user's own computer	Licenses are activated on a common license server
No need for an assigned license server administrator. Each user manages the license server that is installed on the user's own computer.	Centralized maintaining and administration of licenses is needed. A license server administrator maintains the license server and manages the license use. Typically, there are a few Tekla Structures main users in a company. The main users are good candidates for license server administrators, because they are already familiar with Tekla Structures. For more information on the responsibilities of the license server administrator, see Checklist for the on-premises license server administrator (page 361)
No need to manage license access rights. Each user activates only the licenses that are needed.	By default, all license configurations activated on the server are available for all Tekla Structures users. However, centralized access rights management is possible. The license server administrator can give different users access to different configurations. The license server administrator needs to modify the `tekla.opt` options file to manage the license access rights. For more information on managing license access rights, see Modify on-premises license access rights (tekla.opt) (page 397).

Licenses are activated on user's own computer	Licenses are activated on a common license server
Tekla Structures can be used out of office. If the user's license is activated on a computer, license borrowing or a VPN connection is not needed.	Tekla Structures can be used out of office. A user needs to borrow a license from the common license server or use a VPN connection to the license server to use Tekla Structures out of office.
Licenses are used only by one person. Users have access only to the licenses that are activated on their own computer. If a user needs a license that is activated on another computer, the user needs to use the other computer. Another option is to deactivate licenses on one computer and activate them on another, which requires effort.	Licenses are checked out frequently by several users. When the licenses are activated on a common server, they are available for multiple users. The licenses are checked out from the license server only when they are needed. When a user does not need a license, the user closes Tekla Structures and the license becomes available for another user. Changing from using one license to another is simple.
	Rules of license usage Tekla Structures users should accept common rules or an internal company policy. The rules should contain regulations of managing the licenses, for example, who is allowed to borrow licenses. Usage of common rules minimizes the amount of conflicts in license management.

Examples of different on-premises licensing setups

The information on this page is not valid for Tekla subscriptions.

The purpose of the following examples is to provide guidelines for Tekla Structures on-premises license management in companies or organizations of different sizes.

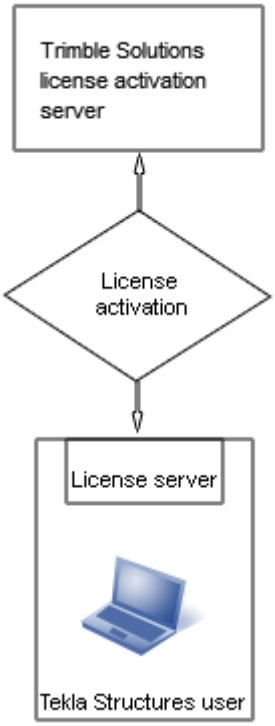
Example 1: One Tekla Structures user, all licenses activated on one computer

Only one user in the company uses Tekla Structures. The user installs Tekla Structures and the license server on the same computer.

- Installing the license server is straightforward, and the default license server settings can be used. The user does not need to modify the license

server settings, because the user runs the license server and Tekla Structures on the same computer.

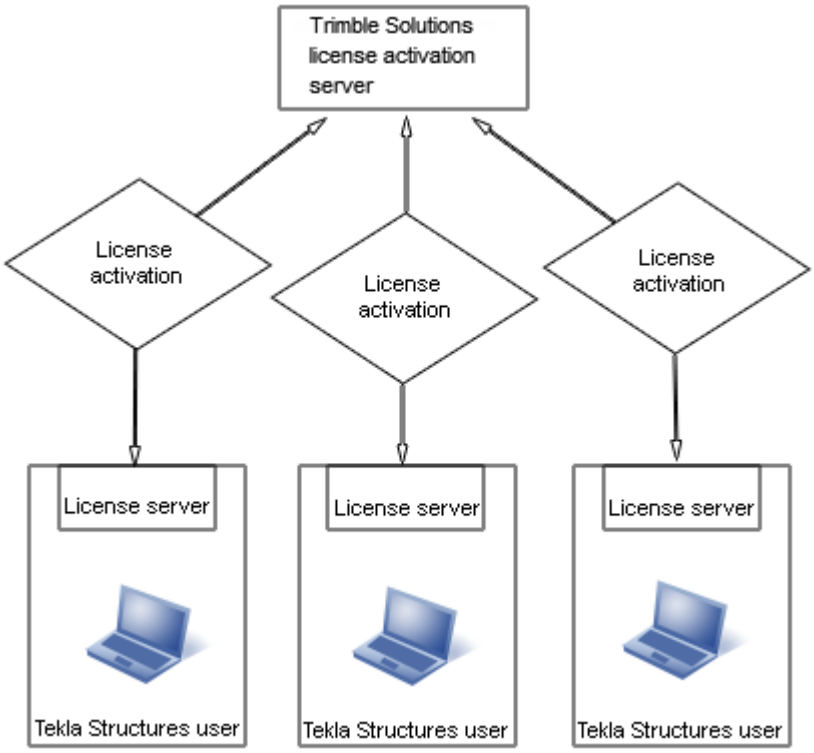
- Because the user installs the license server on a computer, the user does not need to borrow a license or use a VPN connection to use Tekla Structures out of office.



Example 2: Three Tekla Structures users, necessary licenses activated separately on each computer

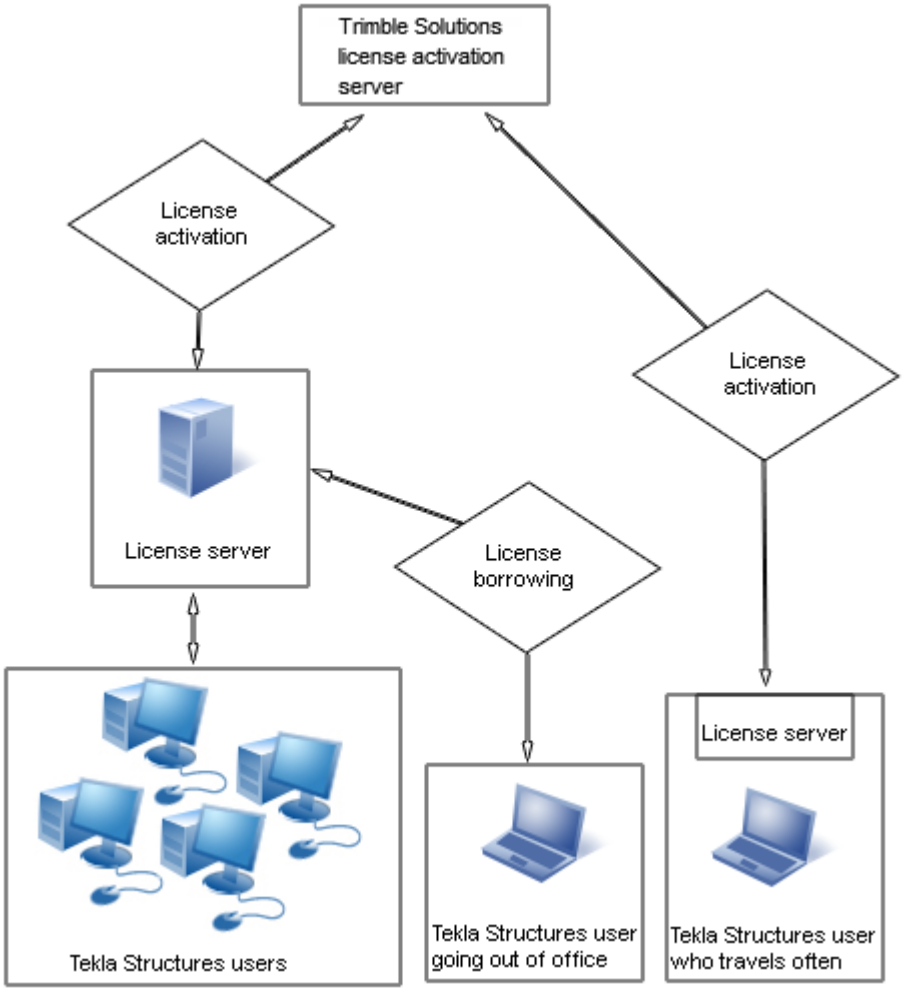
There are three Tekla Structures users in a company. Because the users use different Tekla Structures configurations, each user installs a license server separately on the user's own computer and activates only the needed licenses.

- A license server administrator is not needed, the users maintain their license servers.
- Because the users install the license servers on their computers, they do not need to borrow a license or use a VPN connection to use Tekla Structures out of office.


Trimble Solutions license activation server
License activation
License activation
License activation
License server
License server
License server
Tekla Structures user
Tekla Structures user
Tekla Structures user

Example 3: Ten Tekla Structures users, necessary licenses activated on a common license server and one user's computer

There are ten Tekla Structures users in a compan



y.

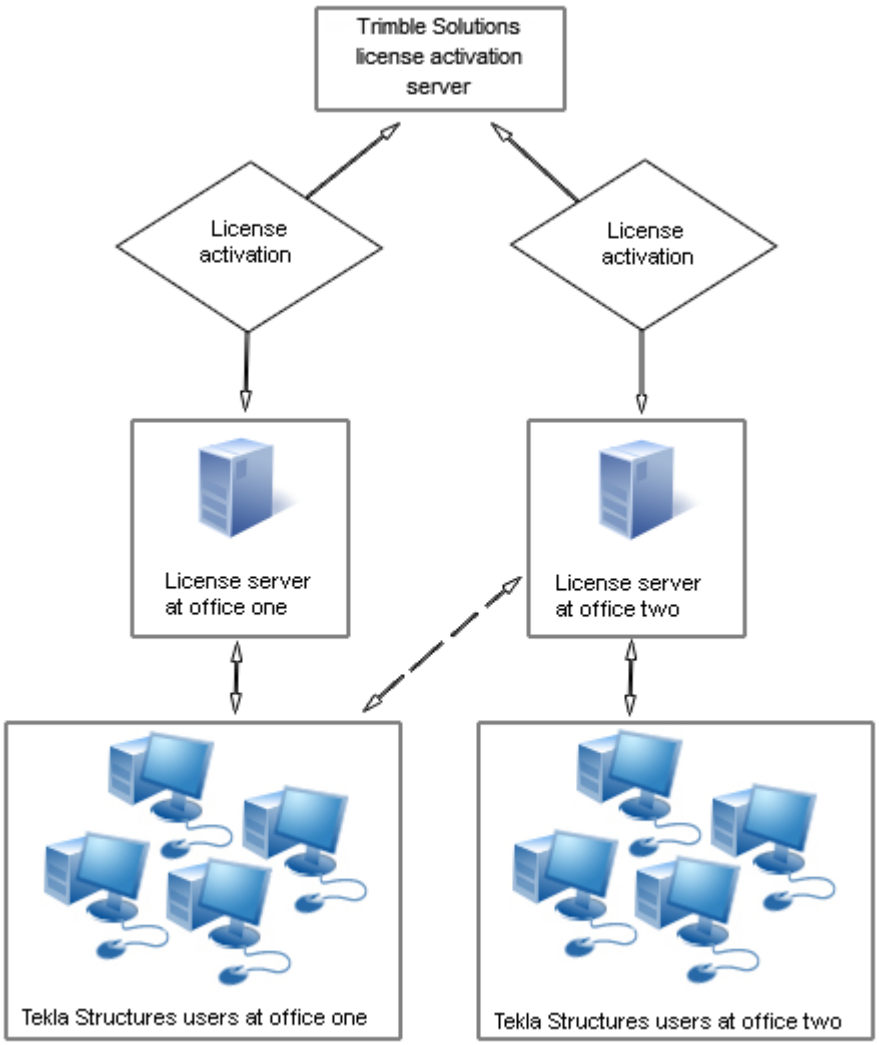
Because the users use different configurations, the company uses a common license server.

- The company has an internal policy for license use containing regulations for managing the licenses.
- One of the main users is assigned as the license server administrator. The administrator installs the license server and informs the other users of the hostname and port number of the server. The license server administrator also performs other server maintenance duties.
- One of the users travels a lot and needs Tekla Structures on the journeys. A license server is installed separately on the user’s computer, so the user does not need to borrow a license or use a VPN connection for offline use of Tekla Structures.
- Other users borrow licenses from the license server when they need to use Tekla Structures offline.

Example 4: Fifty Tekla Structures users in two offices, necessary licenses activated on two separate servers

There are fifty Tekla Structures users in two separate offices. Both offices have their own license servers.

- Both offices have assigned license server administrators. The license server administrators install the license servers and perform license server maintenance duties.
- The company has an internal policy for using licenses. The policy contains, for example, the rules that define who is allowed to borrow licenses.
- Because the amount of Tekla Structures users is large, the license server administrators create `tekla.opt` options files for controlling the access rights for different licenses.
- Only a couple of users need to use Tekla Structures offline. The license server administrators modify the option files to enable the license borrowing only for those users who need to borrow licenses.
- If one server fails, the users can connect to the license server at the other office. If there are licenses available on the license server, the users can use the licenses.



Installing Tekla on-premises license server

The Tekla on-premises license server installation package contains license server files, applications for license management and guides. To install the license server software, download the license server installation package with the latest updates from Tekla Downloads product download service.

You have two choices in installation:

- **Automatic default installation:** Select automatic installation for normal setup. Automatic installation is recommended.

  For detailed installation instructions, see Install Tekla license server - automatic installation (page 371).

- **Manual installation:** Use manual installation if you need to separately install the license server, modify the license file, configure the license service, and start the server software. This is needed if you want to use another TCP/IP port than the one used in the automatic installation, for example. Use manual installation only if you are an advanced user of FlexNet or FlexIm licensing.

  For detailed installation instructions, see Install Tekla license server - manual installation (page 372).

Installing an on-premises license server

If you have on-premises licenses, you must install the license server on your own hardware. If you only use one license of Tekla Structures, you can install the license server on the same computer as Tekla Structures, making the license available on this one workstation. In an environment with multiple licenses and users, you install the license server in your company network, which allows for more flexible and efficient use of your licenses according to need.

Before users can start using Tekla Structures with on-premises licenses, you must:

- Install and set up a license server on a computer.
- Save the entitlement certificate and activate the licenses.
- Connect each client computer with Tekla Structures to the license server either manually, through a customized installation or by instructing the users.

Before installing the Tekla on-premises license server:

- Turn off the internal firewall and pause the antivirus protection.
- Ensure that you have access to the Internet. The Internet connection is needed during the license activation process. An unreliable connection speed can cause errors.
- If you are using other FlexNet licensing services, stop them before you install the Tekla license server. When you have completed installing the Tekla license server, you can restart the other licensing services.

See also

Problems in Tekla license server installation and connecting to the license server (page 412)

Activate on-premises licenses (page 390)

Allowing Tekla on-premises license server to operate through Windows Firewall (page 380)

Which on-premises license server version to use

Check the table below to see which on-premises license server version to use with your current Tekla Structures version. Also check if you need to upgrade to a new service pack or progress release.

For information about updating the on-premises license server, see Update the Tekla on-premises license server.

Tekla Structures version	License Server 2016 SP1	License Server 2017 or later
2018 or later		✓
2017i - all versions		✓
2017 - all versions	✓	✓
2016i - all versions	✓	✓
2016 SP5/PR5 or later	✓	✓
2016 up to SP4/PR4	✓	Upgrade to 2016 SP5/PR5 or later
21.1 SR7 or later	✓	✓
21.1 up to SR6	✓	Upgrade to 21.1 SR7 or later
21.1 all PV versions	✓	✓
21.0 or earlier	✓	✓

For instructions on how to install the license server, see Installing Tekla on-premises license server (page 369).

Install Tekla license server - automatic installation

Before you start license server installation, stop FlexNet licensing services and other licensing services.

For more information about which license server version to use, see Hardware recommendations for Tekla license server.

To install the default setup of the Tekla license server to a computer that does not have a previous version of Tekla license server installed:

1. To download the license server installation package with the latest updates, go to Tekla Downloads, select the Tekla Structures version, and click **All downloads**. On the next page, select **License server** as the **File type** and click **Apply filter**. Then select the **License server**.
2. Select the installation language.

3. Select **Automatic** as the licensing service installation type to install the default setup.
4. Select the folder where you want to install the license server and complete the installation.

Tekla license server is installed.

In automatic license server installation, the license server address is automatically set to `27007@your_hostname`, where `27007` is the port and `your_hostname` is the computer name/hostname. `27007@your_hostname` is used as the license server address in every Tekla Structures installation.

When you have installed the license server, you need to do the following:

- Save the entitlement certificate and activate the licenses. For more information, see Activate on-premises licenses (page 390).
- Connect Tekla Structures to the license server. For more information, see Preconfigure license server settings for users (page 379).
- You can also change the language of the user interface in Tekla License Administration Tool by opening the tool and clicking **Language**.

See also

Install Tekla license server - manual installation (page 372)

Problems in Tekla license server installation and connecting to the license server (page 412)

Problems in Tekla licensing: Error codes and their descriptions (page 426)

Install Tekla license server - manual installation

Use manual installation if you want to separately install the license server, modify the license file, configure the license server, and start the license server software. In manual installation of Tekla license server, you also install two files: `installanchorservice.exe` and `uninstallanchorservice.exe`. You need these files when you manually install or uninstall FlexNet Licensing Service.

For example, you need to install the license server manually if the default TCP/IP port 27007 is already in use by other services or applications, and you need to define another port in the license file `tekla.lic`.

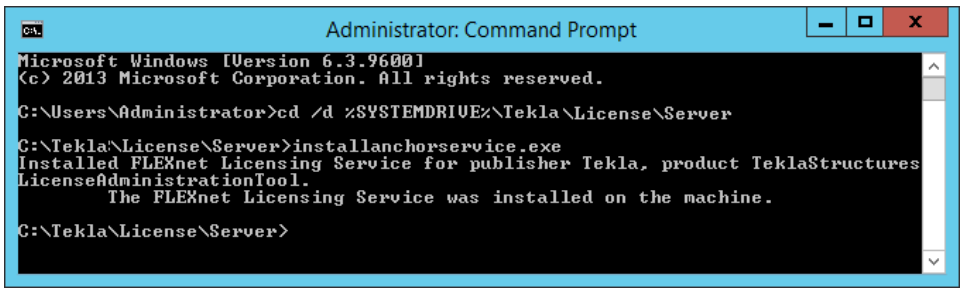
Before you start license server installation, stop other FlexNet licensing services.

To install the license server manually:

1. To download the license server installation package with the latest updates, go to Tekla Downloads, select the Tekla Structures version, and click **All downloads**. On the next page, select **License server** as the **File type** and click **Apply filter**. Then select the **License server**.

2. Select the installation language.
3. Select **Manual** as the licensing server installation type and complete the installation.
4. Go to the **Start** menu or **Start screen** (depending on your Windows operating system) and open **Command Prompt** as administrator.
5. At the command prompt, enter the following commands:
   a. `cd /d %SYSTEMDRIVE%\Tekla\License\Server`
   b. `installanchorservice.exe`

      The licensing server is installed.



6. Modify the license file to include the hostname or IP address of the server, and the correct TCP/IP port:
   a. Open the `..\Tekla\License\Server` folder on the server computer.
   b. Open the `tekla.lic` (license file) file with a text editor.
   c. Replace text `localhost` on the line `SERVER localhost ANY` with the hostname (computer name) or IP address of the license server.
   d. Enter the TCP/IP port number after text `SERVER server_hostname ANY`.
   e. Save the changes and close the text editor.
7. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.
8. On the **Service/License File** tab, click **Configuration using Services**.
9. On the **Config Services** tab to configure the licensing service:
   a. In the **Service Name** box, enter the name of the service exactly as follows: `Tekla Licensing Service`.
   b. Click the **Browse** buttons to locate the `lmgrd.exe` (license server manager), `tekla.lic` and `tekla_debug.log` files.

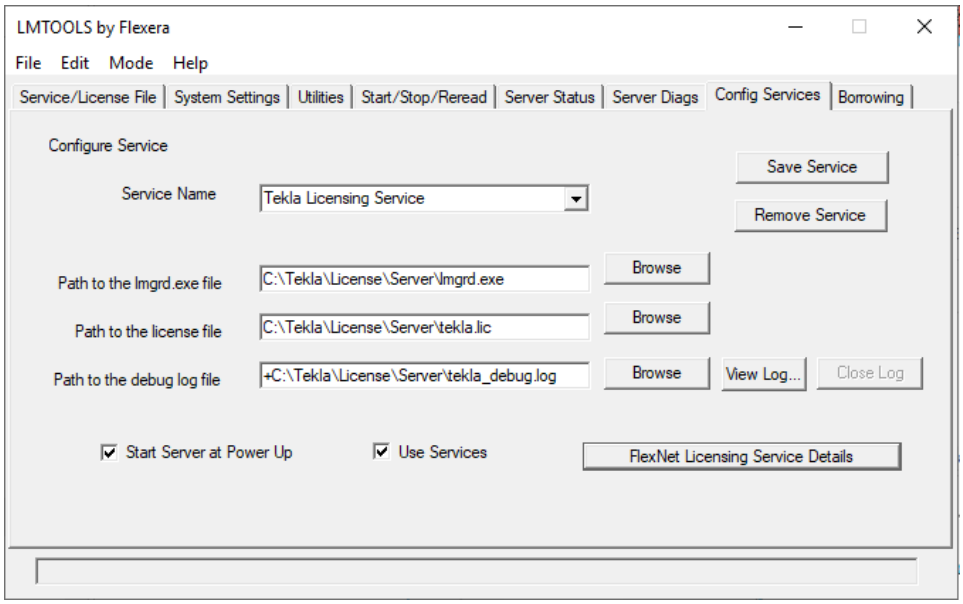
By default, `lmgrd.exe`, `tekla.lic` and `tekla_debug.log` are located in the `C:\Tekla\License\Server` folder.

Note that if you set **Path to the debug log file** outside the `"C:\ProgramData\..."` folder, you get an error message: "Windows preferred path <SystemDrive>\ProgramData to store service data is not set." This error message can be ignored.

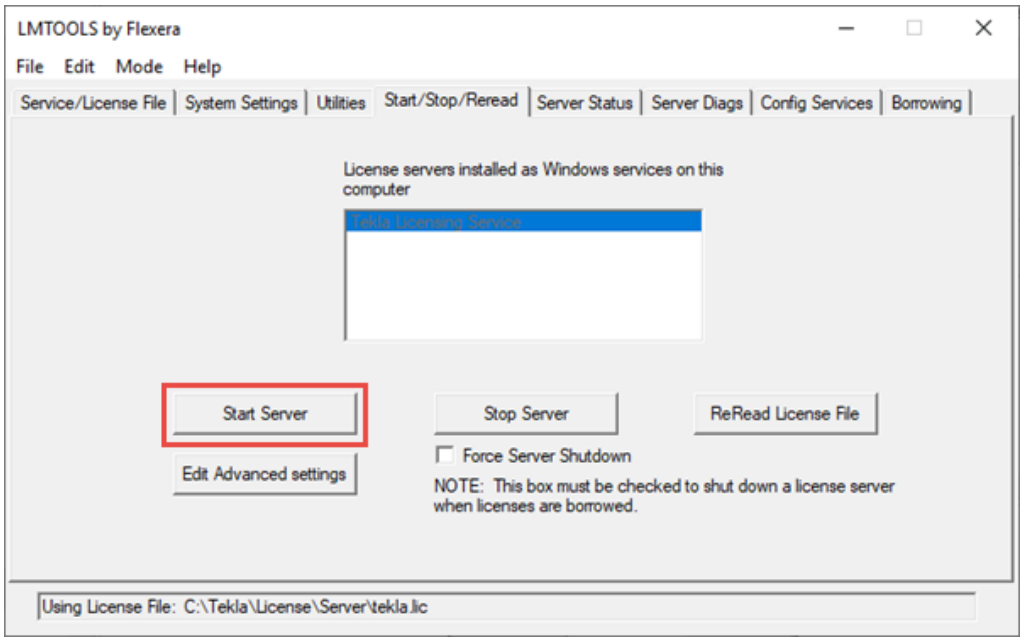
c. Select the **Use Services** check box to run the licensing service as a Windows service.

d. Select the **Start Server at Power Up** check box to start the licensing service automatically after Windows startup.

e. Click **Save Service** to save the settings.



10. Go to the **Start/Stop/Reread** tab and click **Start Server** to start the license server.



11. Go to the **Server Status** tab and click **Perform Status Enquiry**.

    In the status list, the line `License server status` shows the TCP/IP port and hostname of the license server.

    Now you can activate the licenses and connect Tekla Structures to the license server.

    You can also change the language of the user interface in Tekla License Administration Tool by opening the tool and clicking **Language**.

See also

Modify the license file tekla.lic manually (page 375)

Activate on-premises licenses (page 390)

Configure Tekla license server manually (page 377)

Problems using LMTOOLS in Tekla licensing (page 421)

Problems in Tekla licensing: Error codes and their descriptions (page 426)

Modify the license file tekla.lic manually

If you selected the **Automatic** installation option, the license server is set to your hostname: `27007@server_hostname` (`port@hostname`).

The licensing system automatically searches for an available TCP/IP port and uses the first available port detected. The **Automatic** installation sets the port to 27007.

You need to modify the `tekla.lic` license file if you:

- Select the **Manual** license server installation option

- Want to change the TCP/IP port of the licensing server
- Want to use the IP address of your computer instead of the hostname

To modify the license file `tekla.lic` manually:

1. Go to the `..\Tekla\License\Server` folder on the server computer.
2. Open the `tekla.lic` file in a text editor.
3. Make the necessary changes:
   - To use hostname or IP address: Replace text on the first line between words `SERVER` and `ANY` with the hostname or IP address of your license server.

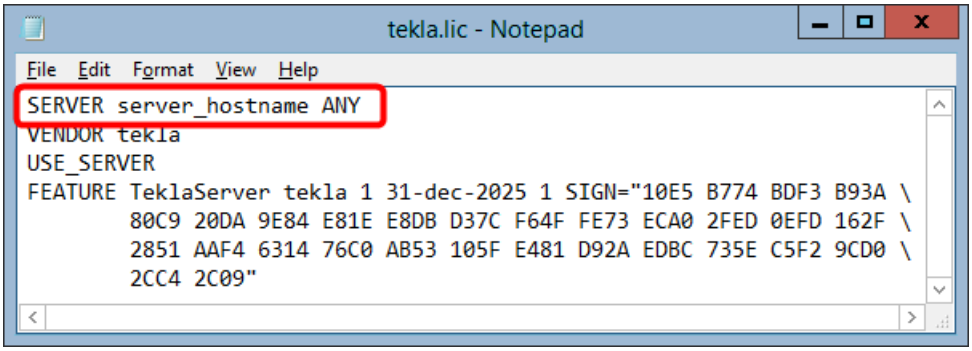
     Do not delete texts `SERVER` and `ANY` when you enter the hostname or IP address of the license server.

     The following formats are valid:

     Hostname:`server_hostname`

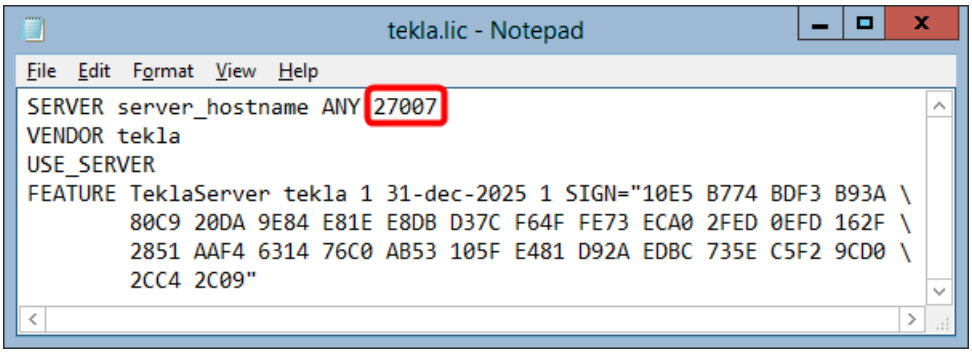
     Domain name: `server_hostname.mycompany.com`

     IP address: `10.0.0.12`

     You can check the hostname of the license server in **LMTOOLS** on the **System Settings** tab. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.
   - To set the TCP/IP port manually: Enter the TCP/IP port number **after** text `SERVER server_hostname ANY`.

     The port number can be any free port in the range of 0 - 64000.



4. Save the changes and close the text editor.
5. Restart the Tekla Licensing Service in **LMTOOLS** or Windows Services for the changes to take effect.

See also

Install Tekla license server - manual installation (page 372)

LMTOOLS options and settings used in Tekla licensing (page 435)

Configure Tekla license server manually

If you encounter problems during the Tekla license server installation, the license server may not start automatically. If this happens, you need to configure the license server manually using **LMTOOLS**.

To configure the Tekla license server manually:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system. Start **LMTOOLS** with administrators rights.
2. Go to the **Service/License File** tab and select **Configuration using Services**.
3. Go to the **Config Services** tab and do the following:

   Service Name: Select the licensing service. When working with Tekla license server, always select Tekla Licensing Service.

   Path to the lmgrd.exe: Click **Browse** and locate `lmgrd.exe`. This file is by default located in the `C:\Tekla\License\Server` folder.

   Path to the license exe: Click **Browse** and locate `tekla.lic`. This file is by default located in the `C:\Tekla\License\Server` folder.

   Path to the debug log file: Click **Browse** and locate `tekla_debug.log`.

   This file is by default located in the `C:\Tekla\License\Server` folder.

   To append the logging entries in the debug log file, start the debug log file name path with the plus sign (+), like by default for `tekla_debug.log`. If

the plus sign is missing, the log file will be rewritten each time the service is started.

Note that if you set **Path to the debug log file** outside the `"C:\ProgramData\..."` folder, you get an error message: "Windows preferred path <SystemDrive>\ProgramData to store service data is not set." This error message can be ignored.

Use Services: Select the check box to run the licensing service as a Windows service.

Start Server at Power Up: Select the check box to start the licensing service automatically after Windows startup.

4. Click the **Save Service** button to save the settings.
5. Go to the **Utilities** tab and do the following:

   Vendor Name: Enter `tekla` (all letters lowercase).

   Path: Enter the name of the license server.

   - If you run the license server and Tekla Structures on the same computer, enter `@localhost`. You can also enter the TCP/IP port, for example, `27007@localhost`.
   - If you run the license server and Tekla Structures on separate computers, enter the hostname of the license server, for example, `@server_hostname`.
   - You can also enter the TCP/IP port of the license server, for example, `27007@server_hostname`. You must define the port if you use another port than the default port.
   - You can also enter several license servers. Separate the server names with a semicolon. For example, `27007@server_hostname;27007@localhost`.
6. Click the **Override Path** button to replace the existing license servers displayed in the status list on the **Server Status** tab.
7. Go to the **Start/Stop/Reread** tab and start the license server by clicking **Start Server**.

   The status bar should display a message telling that server start was successful.
8. Go to the **Server Status** tab and enquire the license server status by clicking **Perform Status Enquiry**.

The status list displayes the TCP/IP port and hostname of the license server. The list should indicate that license server is up and vendor daemon `tekla` is up. The list also displays all the activated licenses on the server.

See also

Installing Tekla on-premises license server (page 369)

LMTOOLS options and settings used in Tekla licensing (page 435)

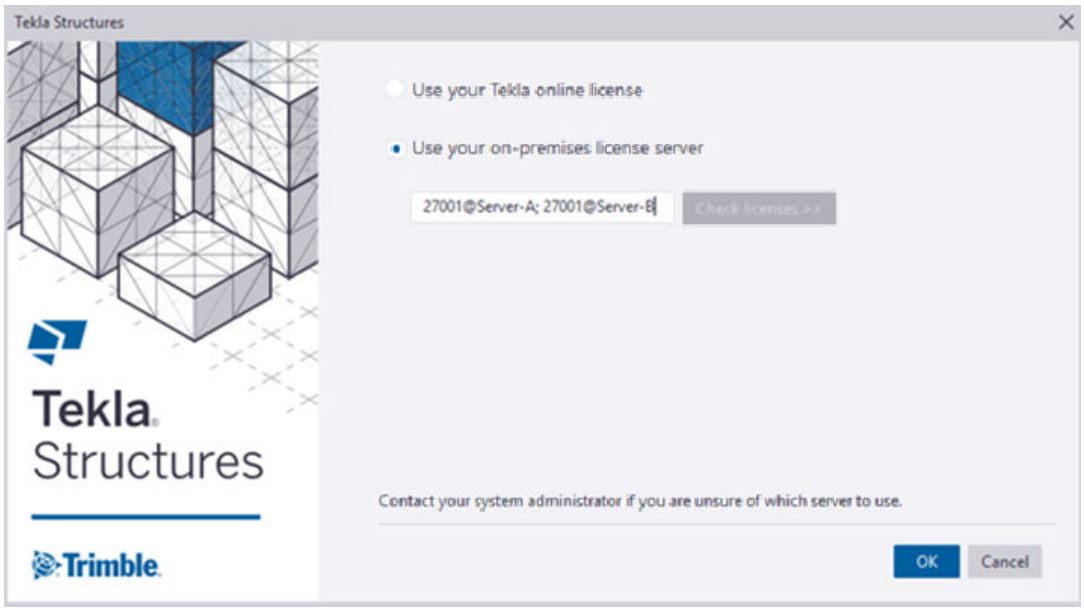
Problems in Tekla licensing: Error codes and their descriptions (page 426)

Preconfigure license server settings for users

When the license server is on a separate server in the network, Tekla Structures connects to the license server to fetch a license. To be able to do this, the license server address must be defined on each computer. This can be done by typing in the address when starting the software for the first time or you can include the address in an intialization file that you distribute as part of your customized installation. You can also predefine the license, environment and role with a customized startup shortcut and intialization file.

By default, when Tekla Structures starts for the first time on a computer, the system asks for the address of your Tekla license server unless Tekla Structures can find a license server with an active license installed on the same computer. To avoid this manual process, you can include the Tekla license server address in your customized configuration. Similarly, you can also select the license for the user, and if you also preset the environment and role, the user does not need to make any selections when starting Tekla Structures. To

set up this for your users, see the instructions in Customize Tekla Structures for users (page 32).



See also

Modify the license file tekla.lic manually (page 375)

Allowing Tekla on-premises license server to operate through Windows Firewall

When you set up Tekla on-premises license server in your network, you might also need to configure the firewall and antivirus settings:

- You must allow the applications `tekla.exe` and `lmgrd.exe` to operate through the firewall on the license servers and on the client computers.
- The internal firewall at your company must allow communication between the license server computer and the client computers where Tekla Structures is installed.
- If your Internet connection is restricted, change your firewall settings to allow outbound traffic on TCP port 443 (the default HTTPS port) to `https://identity.trimble.com` for the Tekla On-demand License Administration Tool and `https://activate.tekla.com` for the Tekla License Administration Tool.
- In addition to allowing the exceptions in your firewall software, you might need to configure exceptions for Windows Firewall. Windows Firewall might be enabled without you being aware of it because some Windows updates might automatically turn on Windows Firewall.

For instructions about how to modify the firewall settings so that Windows Firewall or firewalls from other vendors on the license server allow licensing traffic, see:

- Allow exceptions in firewall for lmgrd.exe and tekla.exe (page 381)
- Allow traffic in fixed TCP/IP ports (page 381)

Allow exceptions in firewall for lmgrd.exe and tekla.exe

You need to allow the applications `tekla.exe` and `lmgrd.exe` to operate through the firewall on the license server computer to enable licensing traffic.

To allow exceptions for `lmgrd.exe` and `tekla.exe` on the license server computer:

1. Press the **Windows logo key + R** on your keyboard to show the **Run** dialog box, then type `firewall.cpl` and press **Enter**.
2. In the left pane, click **Allow a program or feature through Windows Firewall** or **Allow an app or feature through Windows Firewall** (depending on the operating system).
3. In **Allowed programs** or **Allowed apps** (depending on the operating system), click **Change settings**.

   Administrator permission is required. If you're prompted for an administrator password or confirmation, enter the password or confirm.
4. Click **Allow another program** or **Allow another app** (depending on the operating system).
5. Click **Browse** to browse for the `\Server` folder on the computer, select `lmgrd.exe` and click **Open**.

   By default, the path is `...\TeklaStructures\License\Server`.
6. Click **Add** to add `lmgrd.exe` to the **Allowed programs** or **Allowed apps** and features list (depending on the operating system).
7. Select both **Home/Work (Private)** or **Private** (depending on the operating system) and **Public** check boxes next to `lmgrd.exe`.
8. Allow the exceptions also for `tekla.exe` by repeating the steps 4 – 7.
9. Click **OK** to confirm the changes.

See also

Allowing Tekla on-premises license server to operate through Windows Firewall (page 380)

Allow traffic in fixed TCP/IP ports

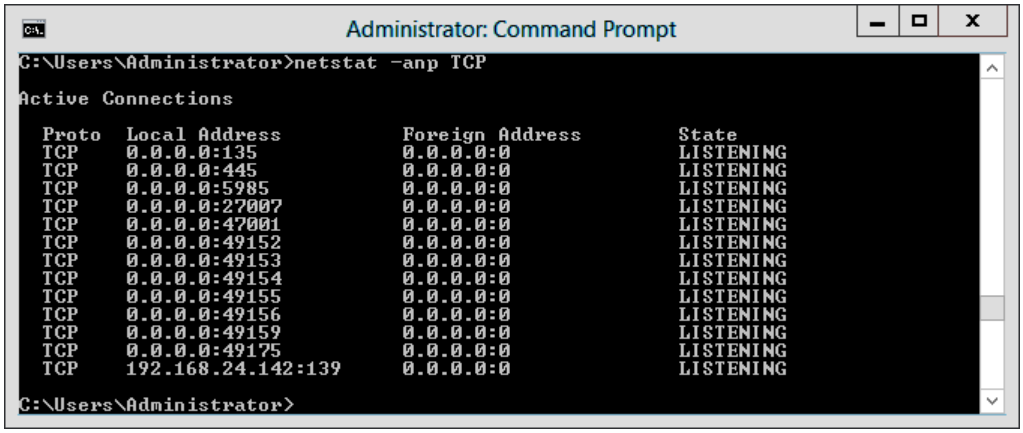
You need to modify the firewall settings to allow traffic through fixed TCP/IP port.

To allow traffic in fixed TCP/IP ports in Windows on the license server computer:

1. Ensure that no other software or service is using the ports that you are about to set fixed.

   Use the command line command `netstat -anp TCP` to find out which ports are in use.

   The numbers in the **Local Address** column after the colon (:) are the port numbers that are in use.

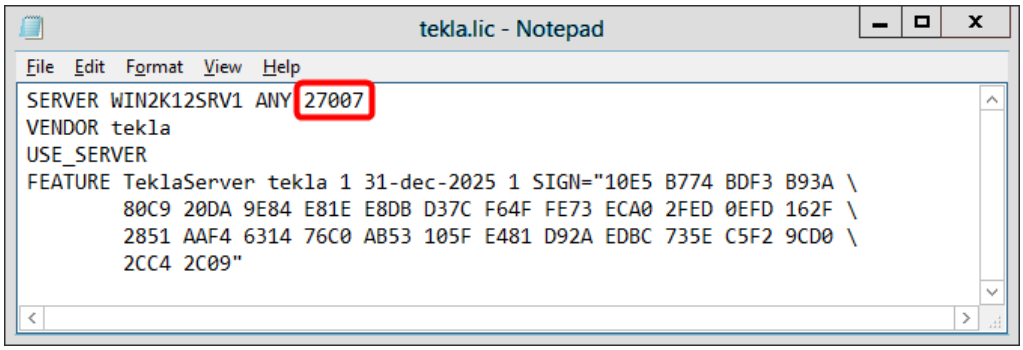


2. Browse for `tekla.lic`, and open it using a text editor.

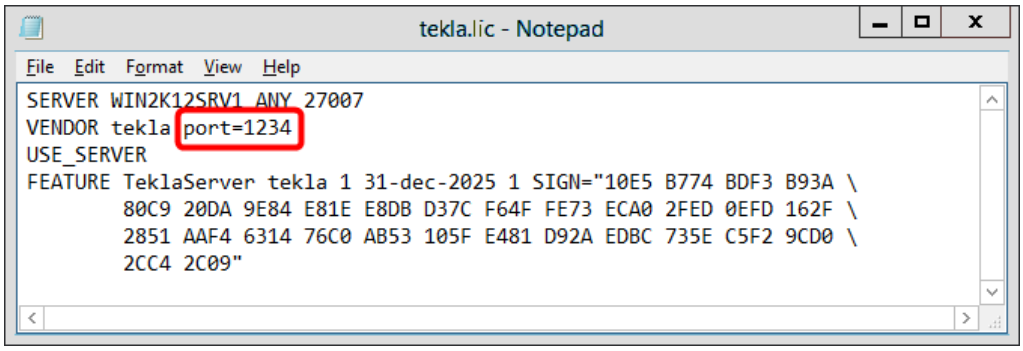
   By default, the path is `..\Tekla\License\Server`.

3. To set a fixed port for `lmgrd.exe`, enter the TCP/IP port number at the end of the `SERVER` row.

   The **Automatic** installation option sets the port to 27007.

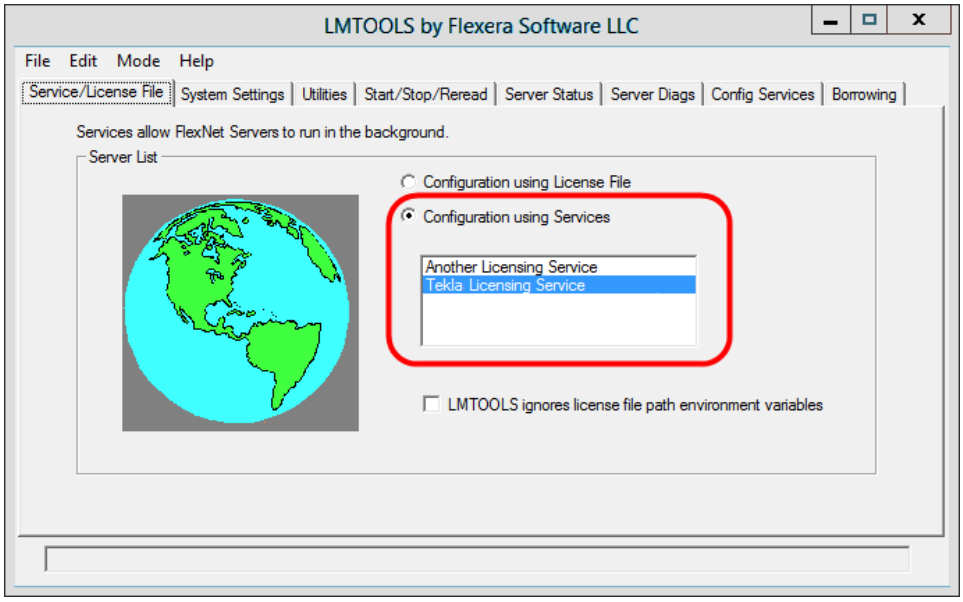


4. Enter the text `port=free_port` at the end of the `VENDOR` row, for example, `port=1234`.



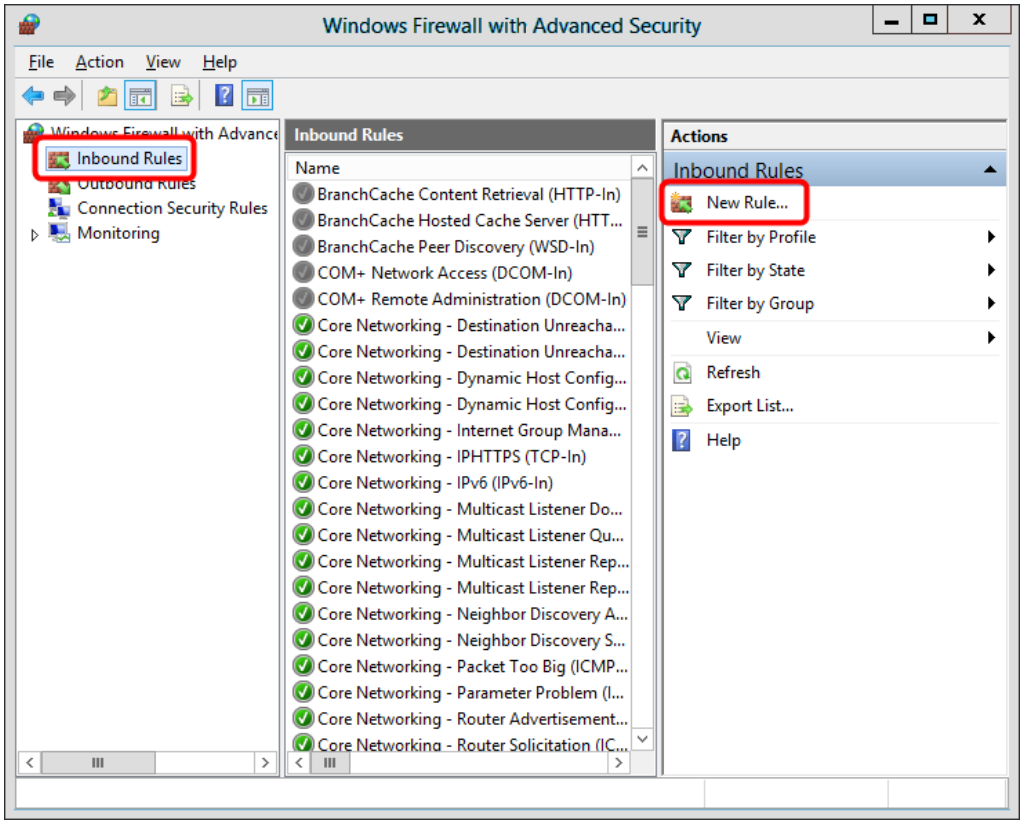
Defining the TCP/IP port number on the `VENDOR` row may slow down the restart time of Tekla Licensing Service.

5. Save the changes and close `tekla.lic`.
6. Update your license server with the changes:
   a. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.
   b. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.

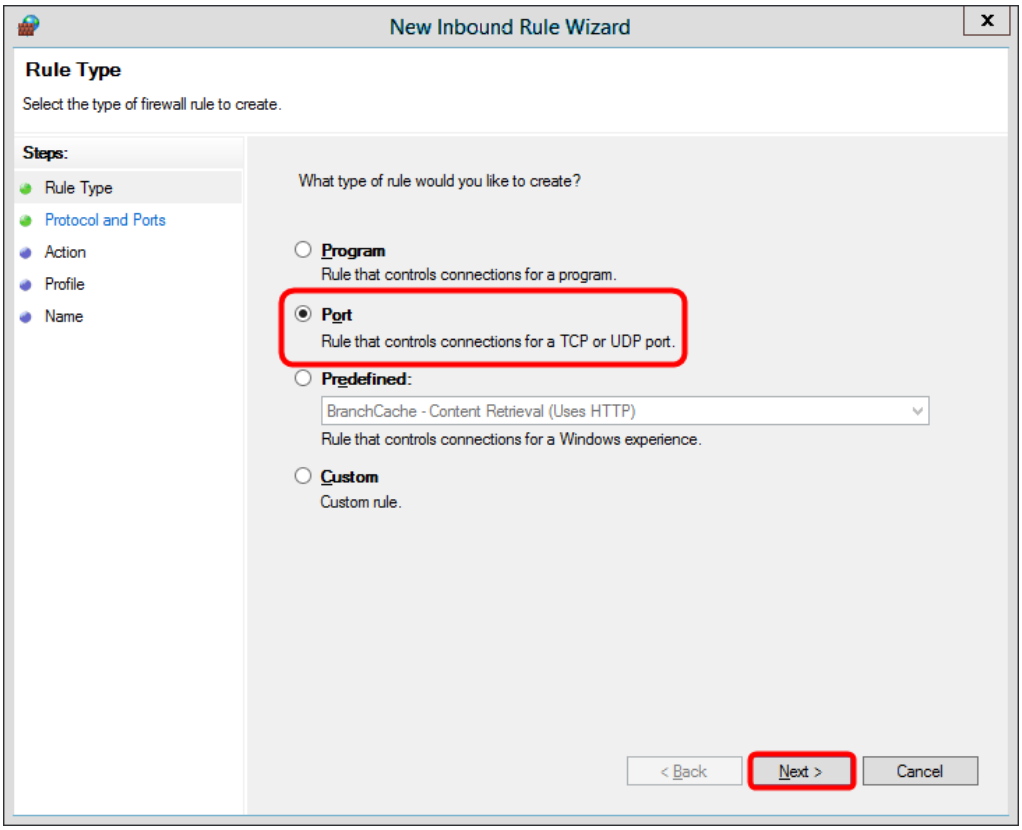


   c. Go to the **Start/Stop/Reread** tab and click **Stop Server** to stop the license server, and then start the server again by clicking **Start Server**.
7. Click the Windows logo key on your keyboard to show the **Start** menu or **Start screen**, depending on the operating system.
8. Type `wf.msc` and press **Enter**. The **Windows Firewall with Advance Security** MMS snap-in is displayed.

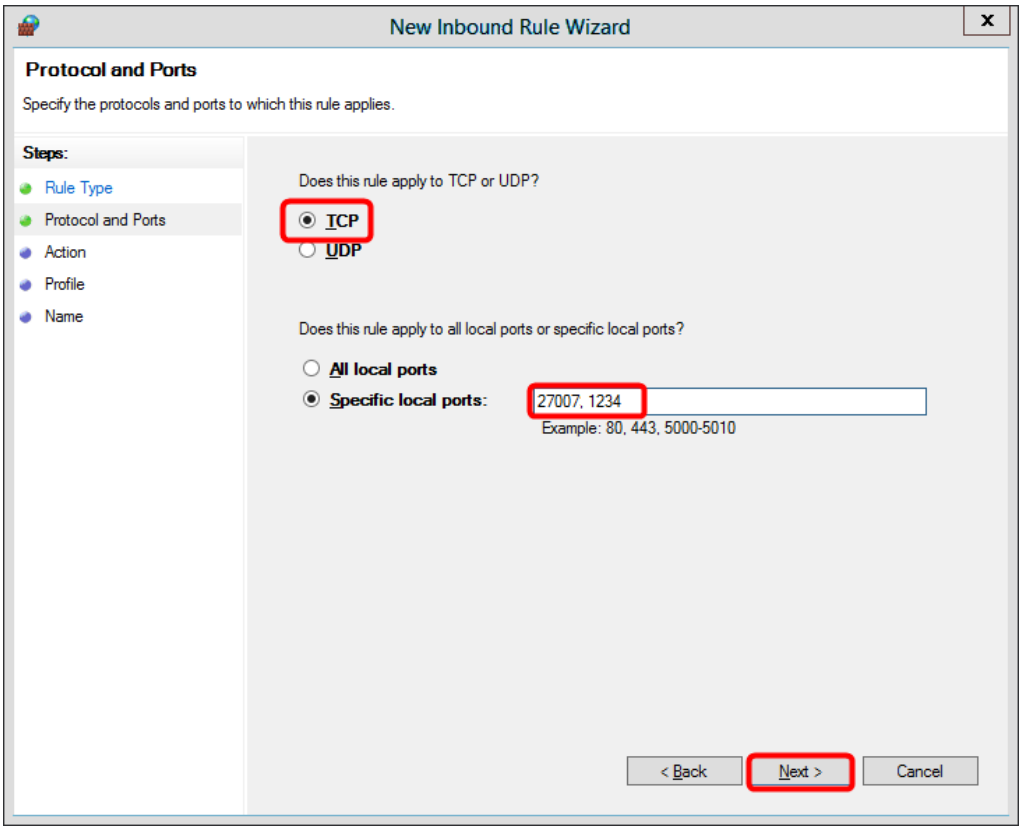
9. In the navigation tree, select **Inbound Rule**, and then in the **Actions** pane, click **New Rule**.



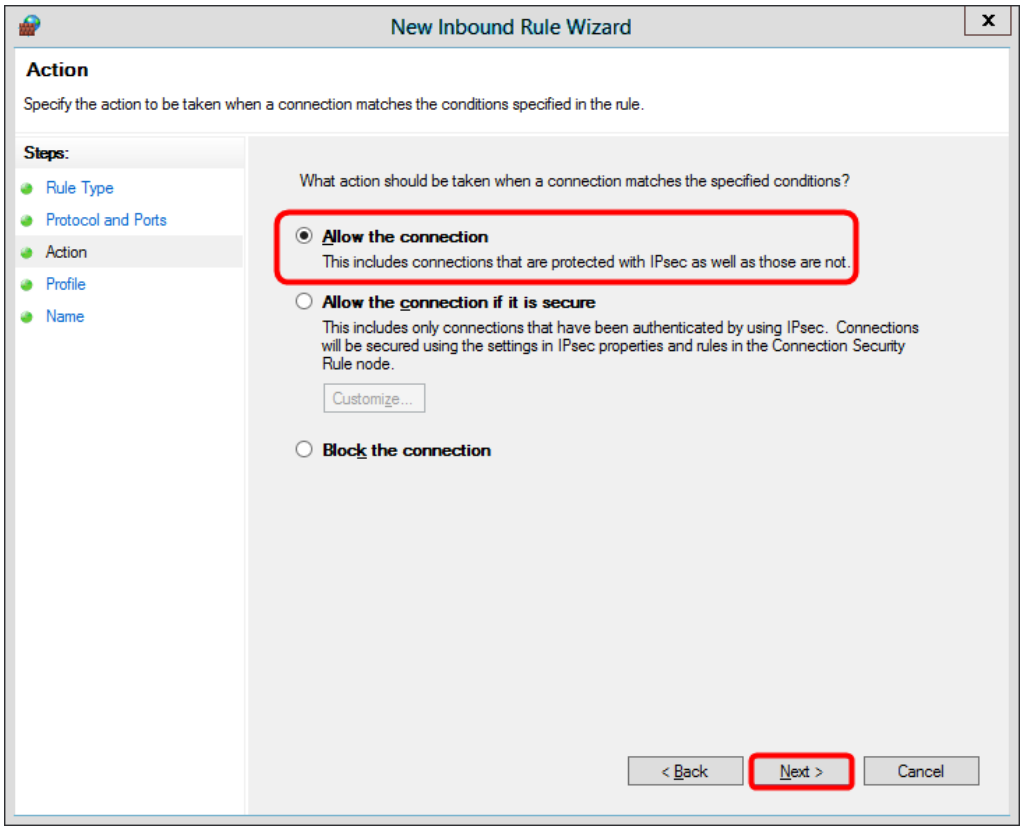
10. On the **Rule type** panel, select **Port** and then click **Next**.



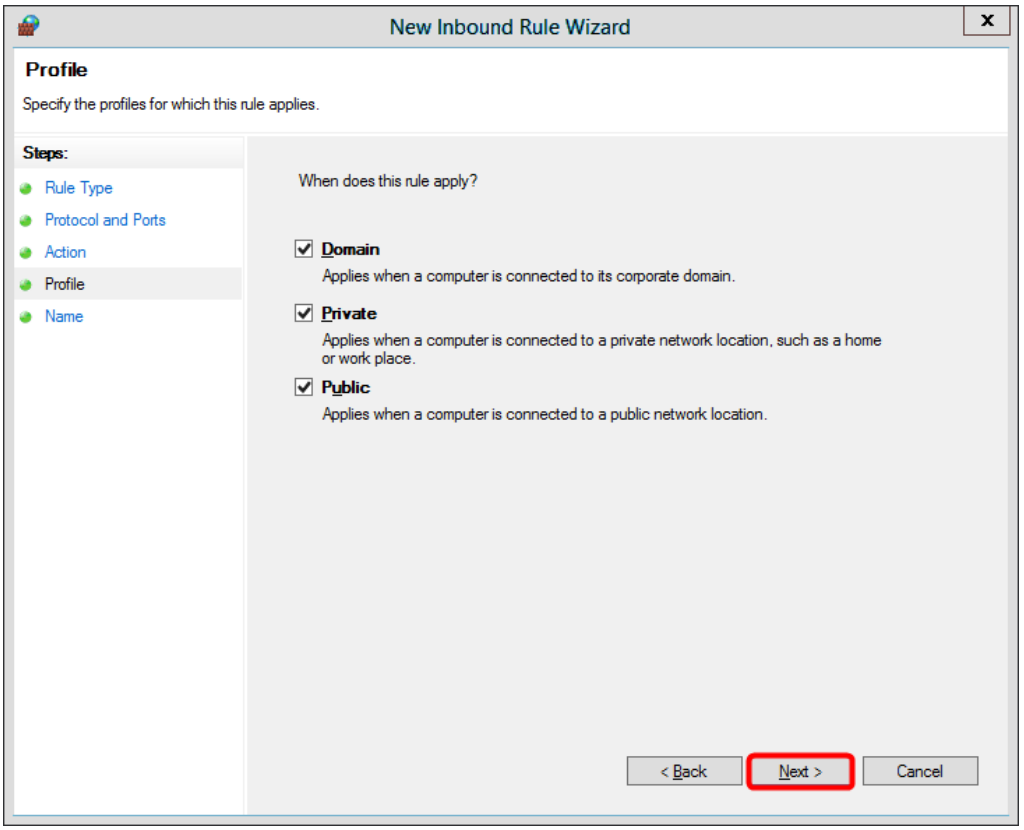
11. On the **Protocol and Ports** panel, select **TCP**, enter the TCP/IP port numbers that you set in steps 3 and 4 in **Specific local ports**, and then click **Next**.


New Inbound Rule Wizard
Protocol and Ports
Specify the protocols and ports to which this rule applies.
Steps:
Rule Type
Protocol and Ports
Action
Profile
Name
Does this rule apply to TCP or UDP?
TCP
UDP
Does this rule apply to all local ports or specific local ports?
All local ports
Specific local ports:
27007, 1234
Example: 80, 443, 5000-5010
< Back
Next >
Cancel

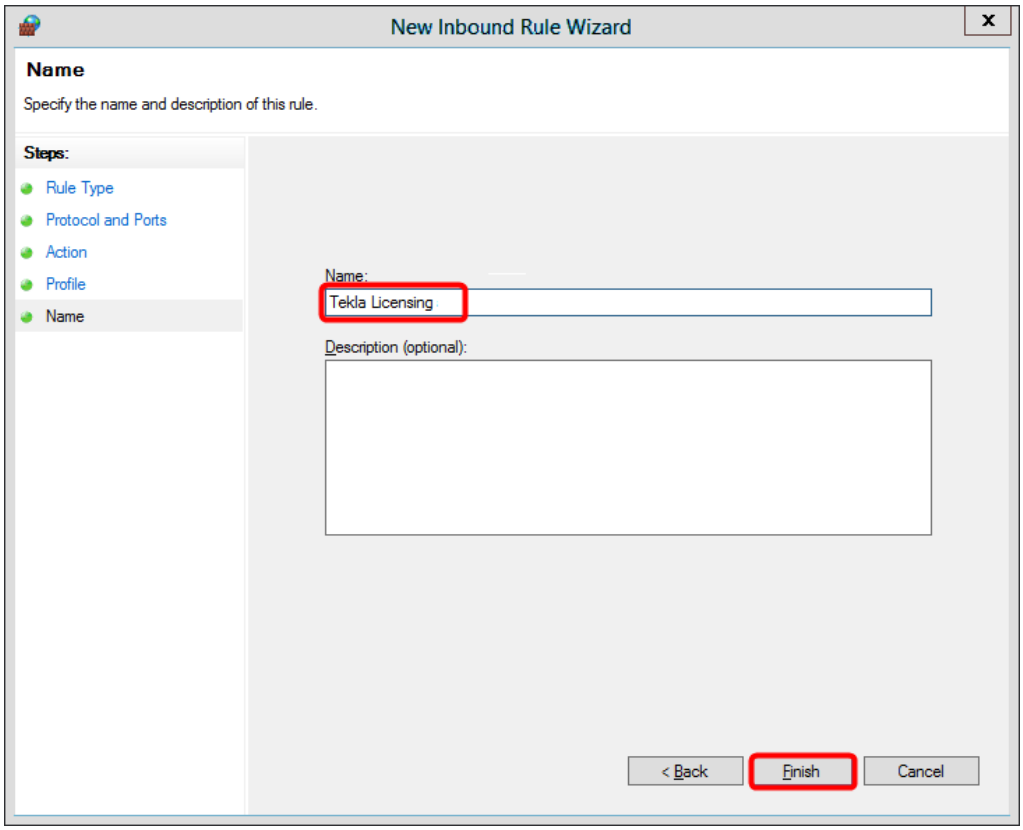
12. On the **Action** panel, select **Allow the connection**, and then click **Next**.



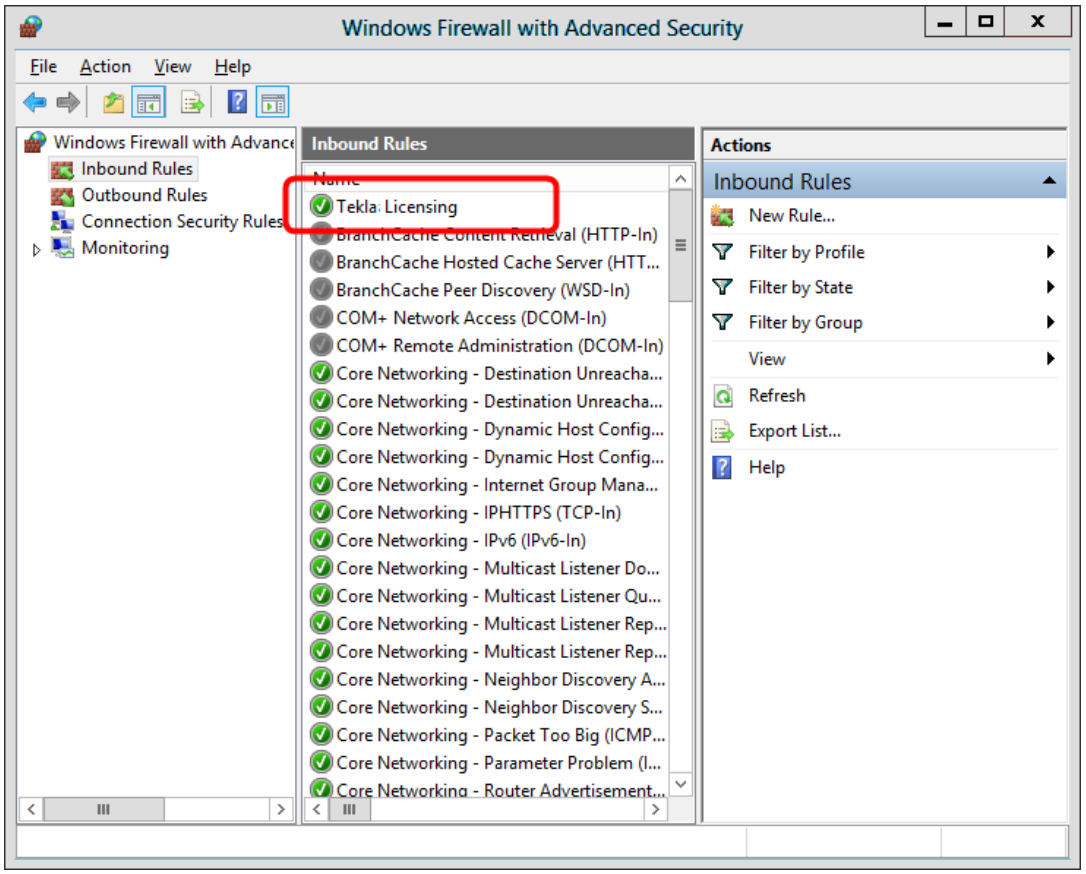
13. On the **Profile** panel, select the appropriate profiles, and then click **Next**.



14. On the **Name** panel, enter the name of the rule, and then click **Finish**.



The rule is created and automatically enabled.



Tekla Structures

Allow exceptions in firewall for lmgrd.exe and tekla.exe (page 381)

Allowing Tekla on-premises license server to operate through Windows Firewall (page 380)

Activate on-premises licenses

You need to activate the on-premises licenses on the license server to be able to use them.

How license activation works

When you activate on-premises licenses, your license server contacts the activation server at Trimble Solutions, and the license rights are transferred to the license server in your company network or on your computer. You can

activate licenses in Tekla License Administration Tool, which is installed together with the license server.

- Internet access is required in license activation because the license server at your company needs to contact the activation server at Trimble Solutions.
- The activation server at Trimble Solutions tracks the activation status of your licenses. You are not allowed to activate any version of the same license again without first deactivating it. Deactivate the licenses before you make any major changes to the computer that runs the Tekla license server.
- You do not need to activate all the licences at once. You can activate part of the licenses now and part of the licenses later on some other computer, for example. Different configurations and different versions need to be selected for activation separately.

Activate licenses

To activate an on-premises license, you must have the corresponding license entitlement certificate file `EntitlementCertificate.html`. The entitlement certificate is sent in an e-mail to the person in your organization who has made the license purchase, or to someone they have named as the contact person. The entitlement certificate states the configurations, quantities and identifiers of the licenses you are entitled to use.

- We recommend that you save the entitlement certificate file `EntitlementCertificate.html` to the `..\Tekla\License\Server` folder. You will need the file again if you later need to move the licenses to a different computer.

  If you have licenses in several entitlement files, rename the files as necessary to avoid overwriting.
- You can activate licenses using either **manual** or **automatic** server notification. Do not use automatic notification if you are using some other FlexNet license and license server administration tool, such as FlexNet Manager. Otherwise, we recommend using automatic notification. You can find the instructions for both procedures below.

Activate on-premises licenses using automatic server notification

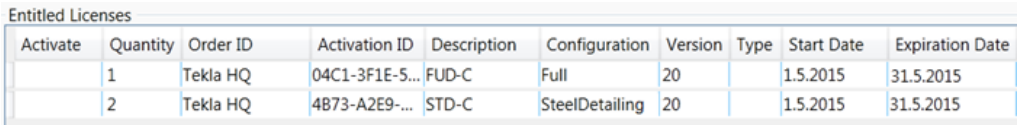
You can activate Tekla Structures on-premises licenses in Tekla License Administration Tool, which is included in the license server installation. To activate the license, the license server at your company contacts the activation server at Trimble Solutions through the internet. Tekla Structures subscriptions do not need to be activated.

NOTE Do not use automatic notification if you are using some other FlexNet license and license server administration tool, such as FlexNet

Manager. To notify the license server about license changes manually, see Activate on-premises licenses.

To activate the licenses and notify the license server automatically:

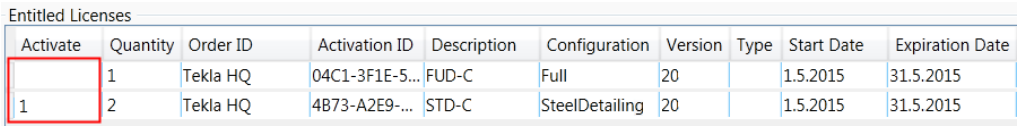
1. Go to **Tekla Licensing** --> **Tekla License Administration Tool** through the **Start** menu or **Start screen**, depending on your Windows operating system.
2. Make sure the automatic license server notification is enabled. Check the status on the  **Notify Server** button in the toolbar and click the button if necessary.
3. Click **Open** and open the `EntitlementCertificate.html` file that contains the license. The license information is displayed in the **Entitled Licenses** area.



Entitled Licenses

Activate	Quantity	Order ID	Activation ID	Description	Configuration	Version	Type	Start Date	Expiration Date
	1	Tekla HQ	04C1-3F1E-5...	FUD-C	Full	20		1.5.2015	31.5.2015
	2	Tekla HQ	4B73-A2E9-...	STD-C	SteelDetailing	20		1.5.2015	31.5.2015

4. Click the **Activate** cell and select the number of licenses to activate.



Entitled Licenses

Activate	Quantity	Order ID	Activation ID	Description	Configuration	Version	Type	Start Date	Expiration Date
	1	Tekla HQ	04C1-3F1E-5...	FUD-C	Full	20		1.5.2015	31.5.2015
1	2	Tekla HQ	4B73-A2E9-...	STD-C	SteelDetailing	20		1.5.2015	31.5.2015

5. Click the **Activate** button.

   Your license server contacts the license activation server at Trimble Solutions.

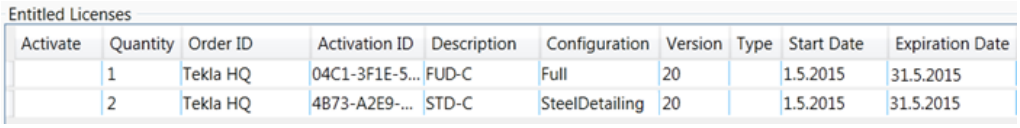
- The activated licenses are displayed in the **Activated Licenses** area.
- We recommend that you back up the trusted storage (`..\ProgramData\FLEXnet\`) in a safe place away from the computer running the license server. Backups can help you restore your licenses on the same server if active licenses are accidentally erased.
- When you open Tekla License Administration Tool later on, it detects expired and broken licenses you may have and asks if you want to deactivate or repair them. If you select **Yes**, an automatic deactivation or repair is run.

Activate on-premises licenses using manual server notification

You have to use manual notification if you are using some other FlexNet license and license server administration tool, such as FlexNet Manager.

To activate the licenses and notify the server manually:

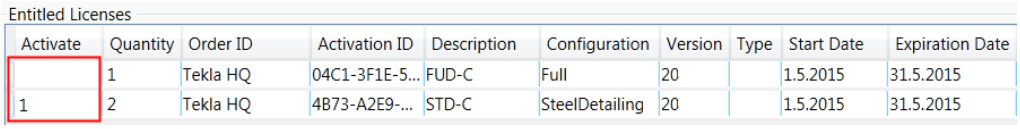
1. Go to **Tekla Licensing** --> **Tekla License Administration Tool** through the **Start** menu or **Start screen**, depending on your Windows operating system.
2. Make sure the automatic license server notification is disabled. Check the status on the  **Notify Server** button in the toolbar and click the button if necessary.
3. Click **Open** and open the `EntitlementCertificate.html` file that contains the license. The license information is displayed in the **Entitled Licenses** area.



Entitled Licenses

Activate	Quantity	Order ID	Activation ID	Description	Configuration	Version	Type	Start Date	Expiration Date
	1	Tekla HQ	04C1-3F1E-5...	FUD-C	Full	20		1.5.2015	31.5.2015
	2	Tekla HQ	4B73-A2E9-...	STD-C	SteelDetailing	20		1.5.2015	31.5.2015

4. Click the **Activate** cell and select the number of licenses to activate.



Entitled Licenses

Activate	Quantity	Order ID	Activation ID	Description	Configuration	Version	Type	Start Date	Expiration Date
	1	Tekla HQ	04C1-3F1E-5...	FUD-C	Full	20		1.5.2015	31.5.2015
1	2	Tekla HQ	4B73-A2E9-...	STD-C	SteelDetailing	20		1.5.2015	31.5.2015

5. Click the **Activate** button.

   Your license server contacts the license activation server at Trimble Solutions.
6. Next, you need to notify the server. This has to be done each time you activate a license.
   a. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.
   b. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.
   c. In the **LMTOOLS** dialog box, go to the **Start/Stop/Reread** tab.
   d. Click **ReRead License File**.

      The license server reads the license information.

- The activated licenses are displayed in the **Activated Licenses** area.
- We recommend that you back up the trusted storage (`..\ProgramData\FLEXnet\`) in a safe place away from the computer running the license server. Backups can help you restore your licenses on the same server if active licenses are accidentally erased.
- When you open Tekla License Administration Tool, it detects expired and broken licenses you may have and asks if you want to repair or deactivate them. If you select **Yes**, an automatic deactivation or repair is run.

See also

Problems in Tekla license activation (page 415)

Problems in Tekla licensing: Error codes and their descriptions (page 426)

Deactivate on-premises licenses

License deactivation releases license rights from a license server, which allows you to activate a new version of the same license or to activate the same license on different hardware. There is no deactivation for Tekla Structures subscriptions.

The activation server at Trimble Solutions tracks the activation status of your on-premises licenses. You are not allowed to activate any version of the same license again without first deactivating it.

When you deactivate licenses, your license server contacts the activation server at Trimble Solutions, and the license rights are transferred away from your Tekla license server.

When you need to deactivate licenses

- Before you upgrade or reinstall the operating system or before you change the hardware components of any computer that has a license server installation with active licenses.
- Before you activate a replacement license, including licenses that entitle you to run a new version of Tekla Structures and replacement licenses for any temporary licenses.
- Before you activate the same license on a different license server, for example, when you want to change from one license server computer to another.
- Before you change the IP address on the license server computer.
- Before you format the hard drive of or decommission your server computer.

When you do not need to deactivate licenses

You do not need to deactivate licenses before uninstalling and reinstalling the Tekla license server software.

Deactivate on-premises licenses

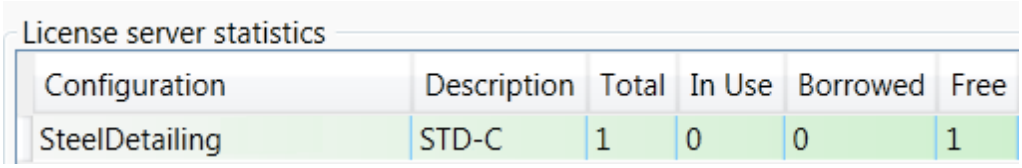
The information on this page is not valid for Tekla subscriptions.

- Internet access is required in license deactivation.

- Deactivation must be done on the license server containing the active license. If your license server fails and cannot be recovered, contact your local support for assistance.

To deactivate licenses:

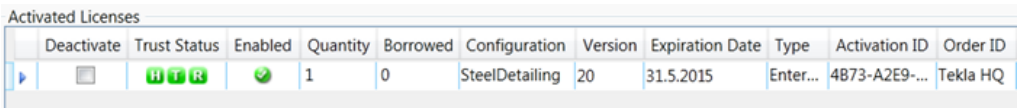
1. Start the Tekla License Administration Tool app with administrator rights. This tool is installed together with the Tekla license server and you can find it through the Windows **Start** menu on the computer that is hosting your license server.
2. In the **Tekla License Administration Tool** dialog box, go to the **Statistic** tab and ensure that no one is using the licenses.



NOTE Before you deactivate licenses, ensure that the licenses are not in use or borrowed. The borrowed licenses must be returned before they can be deactivated.

3. If you have not activated the automatic server notifications (the **Notify Server** option in **Tekla License Administration Tool**), you need to stop the license server manually in **LMTOOLS**:
   a. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system. Start **LMTOOLS** with administrator rights.
   b. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.
   c. Go to the **Start/Stop/Reread** tab and click **Stop Server**.
4. In **Tekla License Administration Tool**, go to the **Licenses** tab.

   The **Activated Licenses** area lists the active licenses.



5. Select the **Deactivate** check box to select the license for deactivation.

   If you activated more than one license of the same type in one go, you cannot deactivate those licenses one by one, but you need to deactivate all of the licenses in one go.
6. The **Deactivate** button is activated, click it.

The license server contacts the activation server at Trimble Solutions. Internet access is required at this stage. After a successful deactivation you will see the

license successfully deactivated message, and the **Tekla License Administration Tool** is updated to reflect the deactivation.

See also

Problems in Tekla license deactivation (page 419)

Problems in Tekla licensing: Error codes and their descriptions (page 426)

Maintain legacy on-premises licenses

After on-premises licensing is set up, you can verify that you have the correct number of licenses and that the licenses are used correctly.

With on-premises licenses, you can monitor who is currently using licenses (page 396).

You need to make changes in the following situations:

- If users are selecting incorrect license types or secondary users are reserving too many licenses, you can ensure that the correct types of licenses are available to the users who most need them by defining access rights for using licenses.

  For adjusting on-premises license usage, see Modify on-premises license access rights (tekla.opt) (page 397).
- If you have on-premises licenses, you need to deactivate your existing licenses (page 394):
  - When you start using a new version of Tekla Structures, which requires activating renewed licenses.
  - Before you activate a changed version of the same license (for example, the number of concurrent users is changed).
  - Before you make hardware changes that affect the license server.
  - If you want to move the licenses to a different license server (page 402).
- If your on-premises licenses become untrusted or disabled, you can repair them a limited number of times as explained in Repair an on-premises license (page 403).

Monitor Tekla Structures license use

With on-premises licenses, you can view current license usage using the LMTOOLS application that is delivered with the Tekla license server.

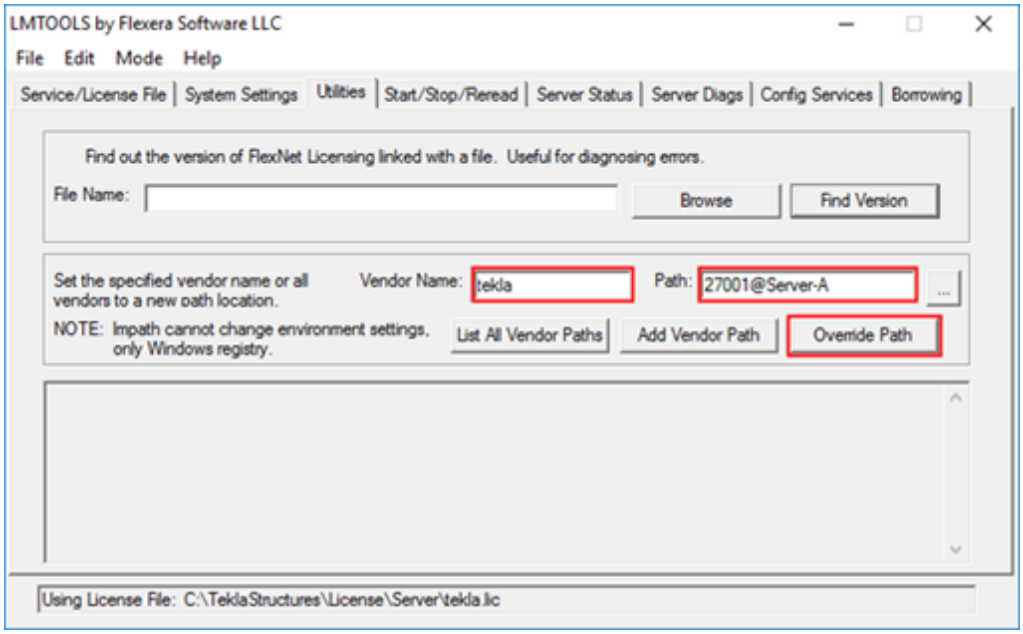
The LMTOOLS application requires Windows administrator privileges to run.

When you use Tekla Structures subscriptions, you can monitor both current subscription users and view statistics about past usage in the Tekla Online

Admin Tool. For more information, see Manage user accounts for Tekla products.

To view which licenses are currently in use:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.
2. If the correct Tekla license server is not defined, switch to the **Utilities** tab and add the license server path:
   a. Type `tekla` in the **Vendor Name** box.
   b. Type your license server address as `port@host` in the **Path** box.
   c. Click **Override Path**.



3. On the **Server Status** tab, click **Perform Status Enquiry**. You will receive a listing of how many licenses and which configurations are activated on the server, and how many of the licenses are in use at the moment of inquiry.

   The status inquiry uses abbreviations of Tekla Structures configurations, which are explained here (page 399). You can also find the description of the abbreviations in your entitlement certificate or in Tekla License Administration Tool.

   For a comprehensive description of the status inquiry syntax, see LMTOOLS options and settings used in Tekla licensing (page 435).

Modify on-premises license access rights (tekla.opt)

The Tekla Structures on-premises license server administrator may grant different users and user groups different rights to use licenses by modifying

the `tekla.opt` options file. This can prevent situations where there are no licenses available for users that need them because someone else has reserved or borrowed a license that they do not really need.

The information on this page is not valid for Tekla subscriptions.

The licensing options file `tekla.opt` is located in the `..\Tekla\License\Server` folder.

The most common configuration options include the following:

- You can define the access rights for specific usernames or hostnames/IP addresses either individually or using groups that you define. You can use the same username or hostname in several groups.
- You can **reserve** a number of licenses for a specific configuration (e.g., Steel detailing) for exclusive use by a specific user or user group. If necessary, the users in the group can reserve more licenses than the reserved quota. Other users can only use one of the remaining free licenses outside the reserved quota.
- You can define a maximum (**max**) number of licenses that a user or group can simultaneously use. Users who are not included in this limitation can use any free license.
- You can **include** (allow) a user or group in the exclusive use of all licenses for a specific configuration. Other users are prevented from using the configuration.
- You can **exclude** (disallow) specific users from using any licenses for a specific configuration. All other users are allowed to use the configuration.
- You can include and exclude users from borrowing licenses.

To modify access rights in the `tekla.opt` file:

1. Go to the `..\Tekla\License\Server` folder.
2. Open the `tekla.opt` file in a text editor.
3. Enter your definitions for license access rights and restrictions.

   The definition string consists of the following parts: `[keyword] [Tekla Structures feature] [user type] [name]`

   When you write the definition, follow the rules below.

   - Note that the options file is case sensitive.
   - If you need to define user groups and host groups, define them first.

     Use Windows user names when defining user groups and hostnames or IP addresses when defining host groups.
   - Enter one definition per row. A definition consists of the following things:
     - An options keyword that defines the actions.

- A feature, such as a configuration, that is affected by the keyword.
- The type that is affected by the keyword.

  The options are: `USER`, `GROUP`, `HOST`, and `HOST_GROUP`.
- The name of the user, user group, host, or host group that is affected by the keyword.

  You can use the hostnames or IP addresses of the computers with the `HOST` and `HOST_GROUP` keywords.

- To disable a row in the options file, enter `#` in the beginning of the row.

Examples of definitions:

`INCLUDE PCD-C USER scarlett` (Only the user scarlett is allowed to use the **Precast Concrete Detailing** configuration.)

`RESERVE 1 RCD-C USER vera` (One license of the **Rebar Detailing** configuration is reserved for the user vera.)

For details about the allowed keywords and configuration codes together with more examples, Configuration codes and keywords used in access right definitions (page 399).

4. Save the changes and close the text editor.
5. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.
6. In **LMTOOLS**, go to the **Start/Stop/Reread** tab and click the **ReRead License File** button to update the changes in the license file and in the options file.

Useful links

For more information about limiting certain Tekla Structures versions to certain users, see the following Support Article in Tekla User Assistance: How to limit certain Tekla Structures version to certain users

Configuration codes and keywords used in access right definitions

When you define access rights in `tekla.opt`, you need to use correct abbreviations (codes) for the configurations, otherwise the definitions do not work. The access rights are defined using certain keywords.

Configuration codes

When you define access rights for different Tekla Structures configurations in the `tekla.opt` options file, you need to add a proper code for each configuration in the definition.

NOTE The configuration codes are backward compatible, and the codes used for licensing in older Tekla Structures versions still work. However, the commercial product name of the configuration may change between

versions. For example, the commercial product name for STDL-C used to be Steel Detailing Limited, but now it is Primary.

The codes for the Tekla Structures configurations are listed below:

Configuration code	Configuration
CM-C	**Construction Modeling**
DEV-C	**Developer**
DFR-C	**Drafter**
EDU-C	**Educational**
FUD-C	**Full**
PCD-C	**Precast Concrete Detailing**
RCD-C	**Rebar Detailing**
SDE-C	**Engineering**
STD-C	**Steel Detailing**
PPC-C	**Production Planner for Concrete**
STDL-C	**Primary**
VIE-C	**Project Viewer**

Most common keywords

The most common keywords that are used for defining license access rights and restrictions in the `tekla.opt` options file are listed and described below:

Keyword	Description	Usage information
`EXCLUDE`	Prevent access to a Tekla Structures configuration.	Use with the abbreviation of the configuration.
`EXCLUDE_ENTITLEMENT`	Prevent license borrowing.	Use with the activation ID of the license.
`EXCLUDEALL`	Prevent access to all Tekla Structures configurations.	
`GROUP`	Define a user group for use with any options.	Use with Windows user names (separated with spaces).
`HOST_GROUP`	Define a host group for use with any options.	Use with computer hostnames or IP addresses (separated with spaces).
`INCLUDE`	Allow a user to use a Tekla Structures configuration.	Use with the abbreviation of the configuration.

Keyword	Description	Usage information
INCLUDE_ENTITLEMENT	Allow a user to borrow a license.	Use with the activation ID of the license.
INCLUDEALL	Allow a user to use all Tekla Structures configurations.	
MAX	Limit the usage of a configuration.	Use with the number of licenses and the abbreviation of the configuration.
RESERVE	Reserve licenses for a user/host or a group of users/hosts.	Use with the number of licenses and the abbreviation of the configuration.

- When somebody is allowed to use a configuration with the INCLUDE keyword, other users are automatically prevented from using the configuration.
- When somebody is denied to use a configuration with the EXCLUDE keyword, other users are automatically allowed to use the configuration.
- If no rules exist, everybody is allowed to use the configuration.

Some examples of definitions in a tekla.opt options file are given below:

Options file definition	Description
INCLUDE PCD-C USER scarlett	Only the user **scarlett** is allowed to use the **Precast Concrete Detailing** configuration.
EXCLUDE FUD-C USER justin	The user **justin** is not allowed to use the **Full** configuration. Other users are allowed to use the **Full** configuration.
GROUP tsusers jessica joe neil INCLUDEALL GROUP tsusers	The users **jessica**, **joe** and **neil** belong to the group **tsusers**. Only the group **tsusers** is allowed to use all configurations.
EXCLUDEALL HOST pcrobert	No configuration is allowed to be used on the computer **pcrobert**.
INCLUDE_ENTITLEMENT qwer-1234-asdf-5678-zx USER gwen	Only the user **gwen** is allowed to borrow a license whose activation ID is **qwer-1234-asdf-5678-zx**.
EXCLUDE_ENTITLEMENT rtyu-9876-fghj-5432-cv USER matt	The user **matt** is not allowed to borrow a license whose activation ID is **rtyu-9876-fghj-5432-cv**.

Options file definition	Description
`GROUP students amy chloe andy dean` `MAX 3 EDU-C GROUP students`	The users **amy**, **chloe**, **andy**, and **dean** belong to the group **students**. The limit to the usage of the **Educational** configuration for the group **students** is three licenses.
`RESERVE 1 RCD-C USER vera`	One license of the **Rebar Detailing** configuration is reserved for the user **vera**.
`GROUP STUDENTS user1 user2 user3` `RESERVE 3 VIE-C GROUP STUDENTS`	The users **user1 user2 user3** belong to the group **STUDENTS**. **3** licenses of the **Project Viewer** configuration are reserved for the group **STUDENTS**. **STUDENTS** is a group name. **user1 - user 3** are Windows user names separated with spaces. The number **3** is the number of licenses to reserve. **VIE-C** is the configuration code for the **Project Viewer** configuration. Note that any licenses reserved for a group are dedicated to that group. Even when that group is not actively using the licenses, the licenses are unavailable to other users.
`INCLUDE VIE-C:VENDOR_STRING=Enterprise USER john`	Only the user **john** is allowed to use the **Project Viewer** configuration which is of type **Enterprise**.

Useful links

For more information about limiting certain Tekla Structures versions to certain users, see the following Support Article in Tekla User Assistance: How to limit certain Tekla Structures version to certain users

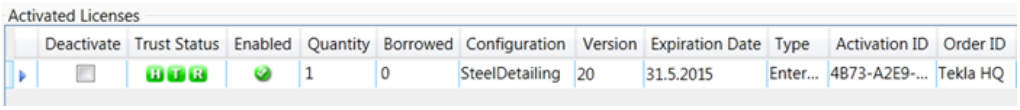
Move licenses between license servers

You can transfer an on-premises license from one license server to another. Moving licenses can be necessary, for example, if you are switching to new hardware or if you want to consolidate licenses from several workstations to a central server.

The information on this page is not valid for Tekla subscriptions.

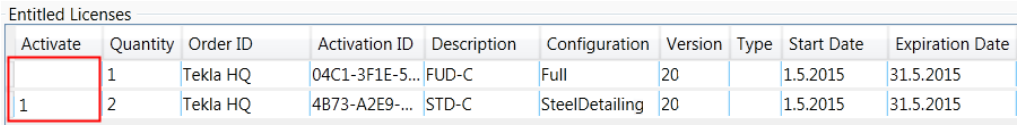
1. Deactivate the licenses that you want to move (page 394) in the Tekla License Administration Tool on the computer that currently contains the

licenses.


Activated Licenses

Deactivate	Trust Status	Enabled	Quantity	Borrowed	Configuration	Version	Expiration Date	Type	Activation ID	Order ID
	H T R		1	0	SteelDetailing	20	31.5.2015	Enter...	4B73-A2E9-...	Tekla HQ

2. If the license entitlement certificate file containing these licenses is not available on the other computer, find the `EntitlementCertificate.html` file that contains the license and copy it to the computer on which you want to activate the licenses.
   - Entitlement certificate files are sent over email. In the installation instructions, we recommend storing the entitlement files in the license server installation folder (`..\Tekla\License\Server\`), from where you can copy it to the same folder on the other computer.
   - Rename the files as necessary to avoid overwriting different entitlement certificate files with each other.
   - There can be several licenses in one file, so you can activate different licenses on different computers using the same entitlement certificate file.
3. Activate the licenses (page 390) in the Tekla License Administration Tool on the other computer to complete the move.


Entitled Licenses

Activate	Quantity	Order ID	Activation ID	Description	Configuration	Version	Type	Start Date	Expiration Date
	1	Tekla HQ	04C1-3F1E-5...	FUD-C	Full	20		1.5.2015	31.5.2015
1	2	Tekla HQ	4B73-A2E9-...	STD-C	SteelDetailing	20		1.5.2015	31.5.2015

We recommend that you back up the trusted storage (`..\ProgramData\FLEXnet\`) in a safe place away from the computer running the license server. Backups can help you restore your licenses on the same server if active licenses are accidentally erased.

See also

Installing Tekla on-premises license server (page 369)

Repair an on-premises license

If your on-premises licenses have become untrusted or disabled, they cannot be used and you need to repair them.

The information on this page is not valid for Tekla subscriptions.

The license trust status is indicated in the **Activated Licenses** area in Tekla License Administration Tool. If a trust status symbol is green, the information is trusted, if red, the information is untrusted.

WARNING Because of technical and security reasons, you can repair an Activation ID only a limited number of times, which at the moment is two times a year. Therefore it is important that you

inform your local Tekla Structures representative about the license repairs you have been performing, and keep count of the repairs.

The status can be one of the following:

- A red **H** (**Host**) indicates that the server has been moved to another computer, or the computer hardware has changed radically.

  The **Host** trust status of your license is not trusted:

  NOTE In some cases, it might not be possible to repair licenses that have the **Host** trust status untrusted.

- A red **T** (**Time**) indicates that the system clock has been tampered with.

  The **Time** trust status of your license is not trusted:

- A red **R** (**Restore**) indicates that the license is obtained from a backup copy.

  The **Restore** trust status of your license is not trusted:

To repair a license:

1. Go to **Tekla Licensing** --> **Tekla License Administration Tool** through the **Start** menu or **Start screen**, depending on your Windows operating system.

   The **Activated Licenses** area displays the activated licenses.

2. Click **Repair**.

   The license server contacts the activation server at Trimble Solutions. After successful repairing the trust status in Tekla License Administration Tool dialog box is updated.

Set up on-premises license borrowing for offline use

Users who want to work in a location that does not have a reliable connection to the on-premises license server can borrow an activated license from the Tekla license server before leaving the office. The user receives a temporary local license file valid for a set time period.

The information on this page is not valid for Tekla subscriptions.

Users can borrow Tekla Structures on-premises licenses for offline use in Tekla License Borrow Tool. Users need to have a network connection to the license server to borrow and return a license.

Borrowed licenses are reserved for the duration of the borrowing even when they are not in use, so the borrowed license is not available for other users.

Configuration files

A product ID (`.tpi`) file is needed for borrowing licenses. If you use the licensing options file (`tekla.opt`) for managing license access rights, you must always provide a customized product ID file for users. The default file that lists all configurations will technically work in other cases, but administrators should still provide a customized product ID file. The customized file makes it easier for the users to select a license, because it includes just those licenses that you have actually activated on the server. For more information, see Provide offline users with a customized product ID file (page 406).

You can define which licenses are available for which users in the licensing options file (`tekla.opt`) on the license server. For more information, see Modify on-premises license access rights (tekla.opt) (page 397).

How on-premises license borrowing works

License borrowing reserves and releases the on-premises licenses like this:

- The maximum license borrow period is one month. The user defines the borrow expiration date when borrowing the license. The borrowed licenses are unavailable to other users until they are returned or the license borrow period ends.
- The user can return a license before the license borrow period is over through the license borrow tool on the borrowing computer. Make sure your users return all borrowed licenses before a major operating system upgrade, reinstallation or major hardware changes on their computer.
- Borrowed licenses must be returned before you deactivate those licenses on the license server, for example, to upgrade the licenses to a new version or to move the license server to new hardware. You can see who has borrowed which licenses by enquiring the license status in the LMTOOLS (page 435) application on the license server.

NOTE If you do not follow the guidelines above, all users may lose the use of the borrowed licenses until the end of the license borrowing period, including the users who originally borrowed the licenses.

1. Install the Tekla License Borrow Tool on the users' computers with customized product ID file(s).

2. To borrow a license, users must open the Tekla License Borrow Tool installed on their computer when they are still online and can connect to the Tekla license server.

   The version of Tekla License Borrow Tool should be the same as the version of Tekla license server.

3. After borrowing a license, users can go offline and freely work with, close and reopen Tekla Structures within the license borrow period.

4. When the users are back online, they should return the borrowed licenses to the license server.

   If a user does not return the license, it becomes available for other users on the license server after the license borrow time is over. However, the license is still listed in the license borrow tool for the user until the user returns it.

For detailed instructions, see Set up Tekla License Borrow Tool for Tekla Structures offline use (page 407).

For end-user instructions, see Borrow a license from on-premises license server (page 408) and Return a borrowed on-premises license (page 410).

See also

Problems in Tekla license borrowing (page 419)

Problems in Tekla licensing: Error codes and their descriptions (page 426)

Provide offline users with a customized product ID file

Tekla License Borrow Tool for on-premises licenses needs the activation IDs of the licenses during borrowing. When you export a product ID file (`.tpi`) in Tekla License Administration Tool, the activation IDs of the activated licenses are written in the file. Then you can send the file to offline users.

The information on this page is not valid for Tekla subscriptions.

When you install Tekla License Borrow Tool, the `standard.tpi` file is automatically installed in the `..\Tekla\License\Borrow` folder. This default product ID file lists all Tekla Structures configurations and their product IDs. However, users can only borrow the licenses that are activated on the license server.

You can create a customized product ID file that only lists the activation IDs of the activated licenses available for borrowing. You need to export the product ID file on the license server computer using Tekla License Administration Tool and save the file on the computers of the users who borrow licenses. The activation IDs are encrypted.

WARNING Product ID files are not updated automatically. If you deactivate borrowable licenses or activate new licenses for borrowing, you

need to export a new product ID file and send it to Tekla Structures offline users who borrow licenses.

1. Go to **Tekla Licensing** --> **Tekla License Administration Tool** through the **Start** menu or **Start screen**, depending on your Windows operating system.
2. Click **Export**.
3. In the **Save Product ID file As** dialog box, enter the name of the product ID file or keep the default file name, select a folder where you want to save the file and click **Save**.
4. In a text editor, open your copy of the product ID file, add the activation IDs of the activated licenses available for borrowing, then save the file.
5. Send the product ID file to the Tekla Structures users who need to borrow licenses and inform the users about the usage of the file.

   If the name of the file is `standard.tpi` and the file is saved in the `..\Tekla\License\Borrow` folder on the user's computer, the file is opened automatically when the user starts Tekla License Borrow Tool.

See also

Set up Tekla License Borrow Tool for Tekla Structures offline use (page 407)

Set up Tekla License Borrow Tool for Tekla Structures offline use

You can use Tekla Structures on-premises licenses offline or off-site by borrowing Tekla licenses with Tekla License Borrow Tool.

The information on this page is not valid for Tekla subscriptions.

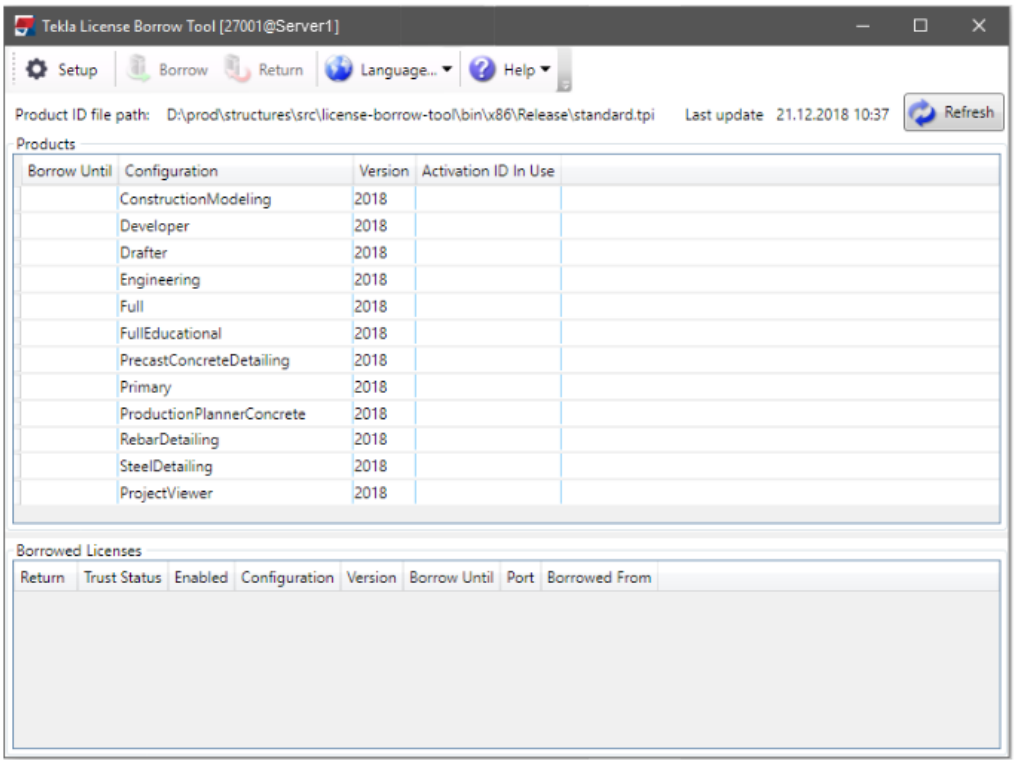
Before you start, download and install the latest Tekla License Borrow Tool from the Tekla Downloads product download page.

You can use the same Tekla License Borrow Tool for borrowing licenses for different Tekla Structures versions. The version of Tekla License Borrow Tool should be the same as the version of Tekla license server.

To set up Tekla License Borrow Tool for Tekla Structures offline use:

1. Go to **Tekla License Borrow** --> **Tekla License Borrow Tool** through the **Start** menu or **Start screen**, depending on your Windows operating system.
2. In the **Setup** dialog box, enter the port number and the hostname (computer name) of the license server in the **Server** box in the format `port@hostname`, for example, `27007@server_hostname`.
3. Still in the **Setup** dialog box, click **Browse** and select the product ID file.
4. Click **OK**.

The **Products** area in the Tekla License Borrow Tool is updated.



5. In the Tekla License Borrow Tool dialog box, click **Language** and change the language of the Tekla License Borrow Tool user interface, if necessary.

NOTE When you start Tekla Structures, and if Tekla Structures does not start with the borrowed license, enter an asterisk (*) in the server box of the licensing dialog box. This will force Tekla Structures to search for all possible locations for the license. This may take a while.

See also

Tekla License Borrow Tool options and settings (page 433)

Problems in Tekla license borrowing (page 419)

Borrow a license from on-premises license server

In Tekla License Borrow Tool, you can borrow Tekla Structures on-premises licenses from Tekla license server when you want to work offline. Borrow the license on the same computer that you will use for offline work.

The information on this page is not valid for Tekla subscriptions.

Before you can borrow an on-premises license, you need to install Tekla License Borrow Tool, connect the computer with Tekla Structures to the license server and open the product ID file.

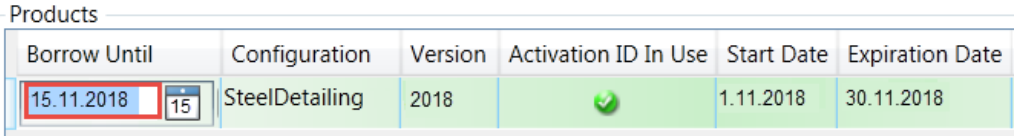
For more information about the prerequisites, see Set up Tekla License Borrow Tool for Tekla Structures offline use (page 407).

To borrow a license:

1. Close Tekla Structures.
2. Go to **Tekla License Borrow** --> **Tekla License Borrow Tool** through the **Start** menu or **Start screen**, depending on your Windows operating system.
3. Click the **Setup** button at the top of the dialog box.
4. In the **Setup** dialog box, enter the port number and the hostname (computer name) of the license server in the **Server** box in the format `port@hostname`, for example, `27007@server_hostname`.

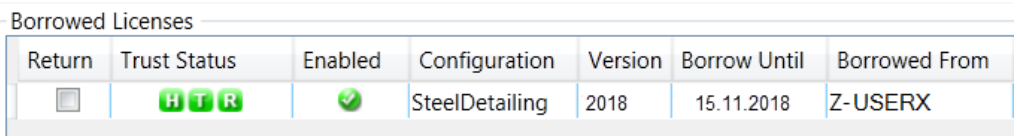
   You need to use exactly the same port and host name as when starting Tekla Structures.
5. Still in the **Setup** dialog box, click **Browse** and select the product ID file.
6. Click **OK**.
7. In the **Products** area, click the **Borrow Until** box and select the expiration date for the borrowing period from the calendar.

   The maximum borrowing period is one month. The exact maximum borrow period varies between 29 to 32 days depending on the borrowing date.



8. Click the **Borrow** button to borrow the license.

   The borrowing progress is displayed in the **Borrowing License(s)** dialog box. After successful borrowing, the **Borrowed Licenses** area shows the borrowed license.



9. To ensure that the borrowing succeeded, disconnect your computer from the license server and start Tekla Structures with the borrowed license.

See also

Problems in Tekla license borrowing (page 419)

Problems in Tekla licensing: Error codes and their descriptions (page 426)

View and diagnose errors in Tekla Structures license activation, deactivation and borrowing (page 411)

Set up on-premises license borrowing for offline use (page 404)

Return a borrowed on-premises license

You can return a borrowed Tekla Structures on-premises license back to the Tekla license server before the expiration date.

The information on this page is not valid for Tekla subscriptions.

A borrowed license is automatically available on the license server on the day following the expiration date.

However, the **Borrowed Licenses** area in Tekla License Borrow Tool is not automatically updated. The license should be returned to the server that has the same name as the name of the server from which the license was borrowed. We recommend that you always return the expired licenses when you want to stop borrowing a license.

To return a borrowed Tekla license:

1. Ensure that you are connected to the license server.
2. Close Tekla Structures.
3. Go to **Tekla License Borrow** --> **Tekla License Borrow Tool** through the **Start** menu or **Start screen**, depending on your Windows operating system.
4. Select the **Return** check box in the **Borrowed Licenses** area to select the license for returning.
5. Click the **Return** button to return the license.

   After successful returning of licenses, the **Borrowed Licenses** area is updated.

See also

Problems in Tekla licensing: Error codes and their descriptions (page 426)

Troubleshoot Tekla Structures legacy on-premises licensing

Click the links below for help in solving problems encountered in the following areas:

- View and diagnose errors in Tekla Structures license activation, deactivation and borrowing (page 411)
- Problems in Tekla license server installation and connecting to the license server (page 412)
- Problems in FlexNet (page 414)

- Problems in Tekla license activation (page 415)
- Problems in Tekla license deactivation (page 419)
- Problems in Tekla license borrowing (page 419)
- Problems in Tekla license trusted storage (page 420)
- Problems using LMTOOLS in Tekla licensing (page 421)
- Problems in starting Tekla Structures (page 423)
- Problems with options file tekla.opt (page 425)

For more information about error messages starting with an error code, see Problems in Tekla licensing: Error codes and their descriptions (page 426).

View and diagnose errors in Tekla Structures license activation, deactivation and borrowing

Tekla License Administration Tool and Tekla License Borrow Tool both give error messages when errors occur. The tools automatically create packages of all necessary files required for diagnosing the errors.

If you have a problem with activating or deactivating licenses, or borrowing or returning licenses, Tekla License Administration Tool and Tekla License Borrow Tool display an error message in the **Activating Licenses(s)**, **Deactivating License(s)**, **Borrowing License(s)** or **Returning Borrowed License(s)** dialog boxes, depending on the subject of the error.

- You can view more detailed information about an error by clicking the **View** button in an error dialog box.
- Tekla License Administration Tool and Tekla License Borrow Tool automatically create zip packages of all necessary files required for diagnosing the errors in the `C:\Tekla\License\Server\Reports` folder and in the `%TEMP%\Tekla License Borrow Tool\Reports` folder. Click **Browse** in the error dialog box to browse for the folder containing the error report package. You can send the package to your local support to get help.

  The error report package contains the following files:

  `tekla_debug.log` - Tekla license server debug log file

  `error.txt` - error report, contains error information. The Tekla License Borrow Tool zip package only contains this file.

  `tekla.opt` - access rights options file

  `tekla.lic` - Tekla license file

See also

Troubleshoot Tekla Structures legacy on-premises licensing (page 410)

Problems in Tekla licensing: Error codes and their descriptions (page 426)

Problems in Tekla license server installation and connecting to the license server

License server installation fails, and the following message is displayed: "A newer version of this application is already installed on this computer. If you wish to install this version, please uninstall the newer version first. Click OK to exit the wizard."

Reason: You have a newer version the license server installed.

Solution: You should not install an old version of the license server. Check the latest available license server release on the Tekla Downloads product download page.

The license server version is not dependent on Tekla Structures. However, if you need to use an older version of the license server for some reason, uninstall the newer version on your computer before installing the older version.

License server installation does not finish (no error message)

Reason: Another software using the FlexNet licensing system is running on the computer.

Solution: Stop all licensing services in **LMTOOLS**, then install the Tekla license server and restart the licensing services you stopped earlier:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.
2. On the **Service/License File** tab, ensure that **Configuration using services** is selected, select a license service from the services list, go to the **Start/Stop/Reread** tab and click **Stop Server**.

   Do the same for all the services you need to stop.
3. Install the Tekla license server.
4. In **LMTOOLS**, start the licensing services you stopped earlier.

Problem in license server connection. The following message is displayed: "Error when connecting to the license server. Contact your system administrator or try another server".

Reason: This problem is often related to firewall settings.

Solution: Check that your firewall allows the client to contact the license server.

License library initialization failed with error: The licensing service is not installed.

Reason: The error occurs when you are starting Tekla License Administration Tool, or when you are trying to run `serveractutil.exe` command line tool.

Solution: If you selected the **Manual** option for Tekla Licensing Service installation then you need to manually install FLEXnet licensing service:

1. If you have some other FlexNet licensing service running on the server, stop it before entering the commands.
2. Go to the **Start** menu or **Start screen**, depending on your Windows operating system, and open **Command Prompt** as an administrator.
3. At the command prompt, type the following commands:

   ```
   cd /D full_path_to_installation_directory
   ```

   For example, if you install Tekla license server to the default folder, you need to enter `cd /D C:\Tekla\License\Server`.

   ```
   installanchorservice.exe
   ```

Cannot connect to the license server.

Solution: For the first time that you connect to the Tekla license server a client computer that has a new version of Tekla Structures installed, you need to do the following:

- Ensure that both (the client computer and the license server) are in the same domain.
- Ensure that Local Area Network connection is established. The license server and the client computers need to be in the same Local Area Network.
- Turn off the firewall and pause the antispyware/antivirus protection of your computer.

After the steps above do the following on your company's license server:

1. Make sure that no one is using Tekla Structures (ask all users to close Tekla Structures).
2. Go to `C:\Tekla\License\Server` and open the `tekla.lic` file in a text editor.
3. Add a free TCP/IP port for the licensing service at the end of the first row, if it does not exist by default. Note that the automatic installation option sets the port by default to 27007.

   Example of the first row: `SERVER MYSERVER ANY 27007`, where `MYSERVER` is the license server and `27007` is the port.

4. Save and close the file after changes.
5. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.
6. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.
7. On the **Start/Stop/Reread** tab, click **Stop Server**. Wait couple of seconds and click on **Start Server**.

After defining the server and the port, do the following on your Tekla Structures workstations:

1. Start Tekla Structures.
2. When you are asked for a server, add the port to the front of the server definition and click **OK**.

   Example: `27007@MYSERVER`

Cannot start the Tekla licensing service.

Reason: The `tekla-debug.log` file may be locked, thus preventing the service from starting.

Solution: Delete the `tekla-debug.log` and restart the computer.

See also

Problems in Tekla licensing: Error codes and their descriptions (page 426)

Installing Tekla on-premises license server (page 369)

LMTOOLS options and settings used in Tekla licensing (page 435)

Allowing Tekla on-premises license server to operate through Windows Firewall (page 380)

Problems in FlexNet

An internal error occurred. FlexNet internal error.

Reason: There is a problem with the Tekla license server installation.

Solution: This error can often be fixed by performing the steps below:

1. Uninstall all existing Tekla license server installations.
2. Check that all the files are deleted from the Tekla license server installation folder: `.. \Tekla\License\Server`.
3. Install the latest Tekla license server. Check for the latest version in Tekla Downloads.

See also

Installing Tekla on-premises license server (page 369)

Problems in Tekla licensing: Error codes and their descriptions (page 426)

Problems in Tekla license activation

The following message is displayed: "Error reading entitlement file".

Reason: The .NET Framework is not working for some reason.

Solution: Reinstall the existing .NET Framework, or install the latest .NET Framework version that is available for your operating system.

License activation fails, and the following message is displayed: "Unable to activate more licenses than you are entitled to".

Reason: There are a couple of possible reasons for the problem:

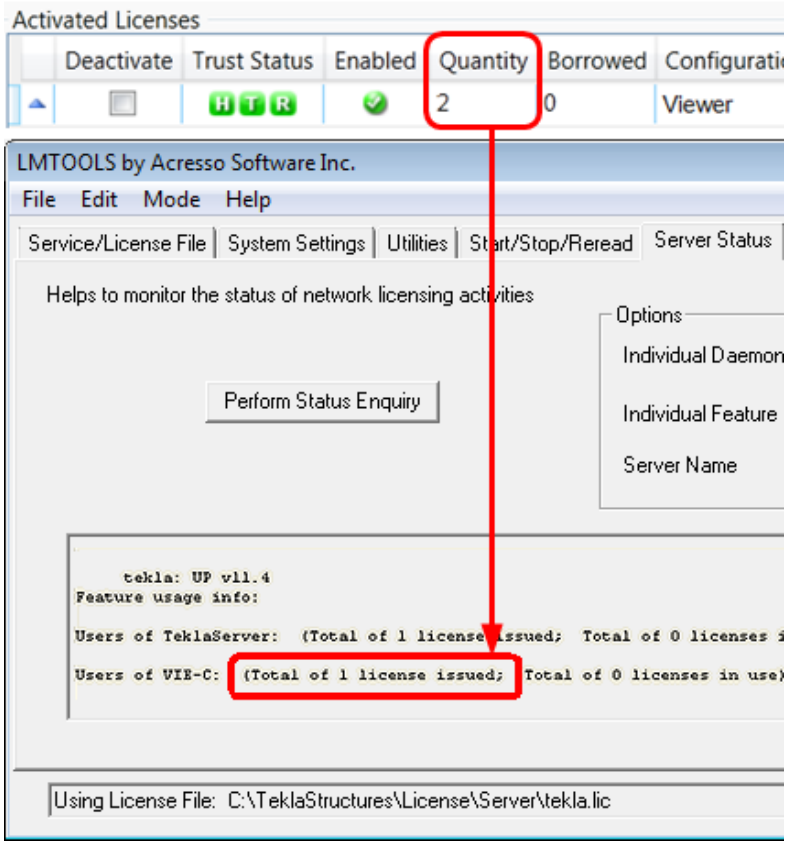
- You may have activated licenses on another computer. You cannot activate more licenses than you are entitled to.
- You tried to activate a renewed temporary license or a permanent license without deactivating the previous temporary license.

Solution: There are two possible solutions:

- Deactivate a license on another computer and then activate the license on your computer.
- Deactivate the existing temporary license and then activate the succeeding linked license.

For more information about deactivating licenses, see Deactivate on-premises licenses (page 394).

The amount of activated licenses in Tekla License Administration Tool and LMTOOLS does not match.



Reason: The licensing service is not updated with new license information.

Solution 1: Reread the license file in **LMTOOLS**:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.
2. On the **Start/Stop/Reread** tab, click **ReRead License File**.

Solution 2: If you are connected to several license servers, rereading the license file may not work. In that case, you need to stop the license server and then restart it in **LMTOOLS**:

1. Ensure that no one is using Tekla license server.
2. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.
3. On the **Start/Stop/Reread** tab in **LMTOOLS**, select the **Force Server Shutdown** check box and click **Stop Server**.
4. Check that the status is "Stopping server". Wait for a few minutes.
5. Click **Start Server**, and ensure that "Server Start Successful" is displayed.

TIP To avoid the problem in the future, ensure that the license server is automatically notified when you activate, deactivate, or repair licenses.

To enable the automatic notification functionality in Tekla License Administration Tool, click the **Notify Server** button.

For more information about starting and stopping server and rereading the license file, see LMTOOLS options and settings used in Tekla licensing (page 435).

For more information about activating licenses, see Activate on-premises licenses (page 390).

No warning is displayed, even though the temporary license will expire within one month.

Reason: The expiry warning message appears only when someone uses the expiring license. Probably there are several permanent licenses (that have been activated first) and some temporary licenses that have been activated after the permanent ones.

When somebody starts Tekla Structures, the system uses licenses in the order of activation. For example, if you have 10 permanent and 2 temporary licenses, all 10 licenses must be in use before someone obtains the temporary license, and receives the warning about the expiring license.

When you try to open the entitlement certificate in Tekla License Administration Tool, nothing is shown.

Reason 1: You have not downloaded the attached entitlement certificate from your e-mail application, but opened the certificate in an Internet browser and saved it as an `.html` file from the browser.

Solution: Open the e-mail containing the entitlement certificate attachment `EntitlementCertificate.html`. Download the entitlement certificate to the `..\Tekla\License\Server` folder from e-mail. Then try to open it again in Tekla License Administration Tool by clicking **Open**.

For more information, see Activate on-premises licenses (page 390).

Reason 2: The virus protection system of your computer has removed the Trimble Solutions logo from the license entitlement certificate.

Solution: The sender of the entitlement certificate should zip the entitlement certificate file. Unzip the entitlement certificate file on the computer where the licenses are going to be activated.

License was activated successfully, but the following error message is

displayed when you run the command line command ”serveractutil -view”: "Activation library initialization failed."

Reason: The license server installation was not successful.

Solution: Do the following:

1. Stop other FlexNet licensing services in **LMTOOLS**.
2. Run the `installanchorservice.exe` at the command prompt, restart the license server.

After doing this you will be able to activate your licenses and use Tekla Structures.

If the above did not work, you need to uninstall the license server and reinstall the recent version once again with administrator rights.

For more information about uninstalling and installing the license server, see and Installing Tekla on-premises license server (page 369).

The automatic notification functionality in Tekla License Administration Tool does not work: nothing happens when you click the Notify Server button

Reason: One of the reasons why the **Notify Server** button does not work in Tekla License Administration Tool might be that Tekla Licensing Service is not started on the computer.

Solution: To solve the issue, open Windows **Control Panel** --> **Administrative Tools** --> **Services** . Ensure that the Tekla Licensing Service status is **Running** . The **Startup Type** of the service should be set either to **Automatic** or to **Automatic (Delayed Start)**.

Your licenses no longer appear as activated licenses, or old version licenses are activated, but they do not work.

Reason: Windows system restore may cause problems for licensing. For more information, see Windows system restore might affect your model and licensing.

Useful links

For more information about the status of the activated licenses in the trusted storage, see instructions in the following Support Articles in Tekla User Assistance:

Checking the status of the activated licenses in the trusted storage

Checking the status of the activated licenses in the trusted storage (including borrowing info)

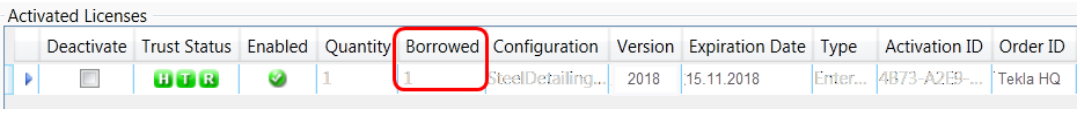
See also

Problems in Tekla licensing: Error codes and their descriptions (page 426)

Problems in Tekla license deactivation

⚠

Unable to select a license for deactivation.



Reason: You cannot select a license for deactivation if the license is still borrowed.

Solution: Return the license and then deactivate the license.

See also

Problems in Tekla licensing: Error codes and their descriptions (page 426)

Deactivate on-premises licenses (page 394)

Problems in Tekla license borrowing

⚠

Unable to select a date from the calendar in the Borrow Until box.

Reason: The maximum borrowing period is one month.

Solution: In Tekla License Borrow Tool, select a date that is within one month from the date of borrowing:

1. Go to **Tekla License Borrow** --> **Tekla License Borrow Tool** through the **Start** menu or **Start screen**, depending on your Windows operating system.
2. In the **Products** area, click the **Borrow Until** box and select from the calendar the expiration date that is within one month from the date of borrowing.

⚠

Tekla Structures does not start up with the borrowed license.

Problem: You borrowed a license and disconnected from the network. When you open Tekla Structures, the licensing dialog box is displayed, but Tekla Structures does not find the borrowed license.

Solution: If Tekla Structures does not start up with the borrowed license, please type only an asterisk character (*) into the server box in the licensing dialog box.

This will force Tekla Structures to search for all possible locations for the license. It might take some time until it finds the license.

The computer that is running a borrowed license crashed, what should I do?

Solution: If your computer only needs rebooting, you can use the borrowed license again after rebooting. If your computer completely breaks down, the license will automatically be available on the license server when the borrowing period expires.

See also

Problems in Tekla licensing: Error codes and their descriptions (page 426)

Set up on-premises license borrowing for offline use (page 404)

Problems in Tekla license trusted storage

A license cannot be used.

Reason: The **Host** (**H**) trust status of your license is not trusted. Hardware setup of your server computer has changed radically.

Solution: The licenses with the untrusted **H** trust status cannot be repaired. Contact your local support.

We recommend that you run your license server on a proper server computer that is regularly maintained. You need to deactivate your licenses before performing any maintenance actions on your server computer. However, unnecessary deactivations should be avoided due to technical and security reasons.

For more information, see Repair an on-premises license (page 403).

A license cannot be used.

Reason: The **Time** (**T**) trust status of your license is not trusted. Time settings of your server computer have changed radically.

Solution: You need to set the correct system date and time and after that repair the license in Tekla License Administration Tool.

Do not manipulate system clock settings of the server computer that has activated licenses.

For more information, see Repair an on-premises license (page 403).

⚠

A license cannot be used.

Reason: The **Restore** (**R**) trust status of your license is not trusted. Your backup system may have overwritten some licensing information.

Solution: You need to repair the license in Tekla License Administration Tool.

We recommend that you configure your system backup settings so that the existing licensing software, tools and files are not automatically overwritten or replaced with the restored ones.

For more information, see Repair an on-premises license (page 403).

See also

Problems in Tekla licensing: Error codes and their descriptions (page 426)

Repair an on-premises license (page 403)

Problems using LMTOOLS in Tekla licensing

⚠

LMTOOLS does not reread the license file.

Reason: Rereading the license file does not work if you are running a licensing service locally on your computer and you are connected to another license server at the same time.

Solution: You need to stop and restart the licensing service. Do the following:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.
2. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.
3. On the **Start/Stop/Reread** tab, click **Stop Server** and wait a few seconds for the service to stop.
4. Click **Start Server**.

LMTOOLS is unable to stop the license server, and the message "Unable to Stop Server" is displayed in the LMTOOLS message bar.

Reason: You may have selected an incorrect licensing service.

Solution: You need to select Tekla Licensing Service as the licensing service. Do the following:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.
2. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.
3. Go to the **Start/Stop/Reread** tab, and click **Stop Server**.
4. If this does not help, select the **Force Server Shutdown** check box and click **Stop Server** again.

LMTOOLS is unable to stop the license server.

Reason: You did not run **LMTOOLS** with administrator rights.

Solution: Run **LMTOOLS** with administrator rights. For more information, see Rights needed for administrator tasks in on-premises licensing (page 362).

Starting or stopping the server or rereading the license file cannot be performed, and the message "No Server Selected" is displayed.

Reason: You have not selected the licensing service.

Solution: You need to select Tekla Licensing Service as the licensing service. Do the following:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.
2. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.
3. Go to the **Start/Stop/Reread** tab and start or stop the server or reread the license file.

Starting or stopping the server or rereading the license file is not possible.

The status list in **LMTOOLS** indicates that the license server manager (lmgrd) has not been started: "Error getting status: Cannot connect to license server system. The license server manager (lmgrd) has not been started yet, the wrong port@hostname or license file is being used, or the port or hostname in the license file has been changed".

Reason: LMTOOLS points to the wrong lmgrd.exe.

Solution: You need to modify the settings in **LMTOOLS**. Do the following:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.
2. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.
3. Go to the **Config Services** tab, and click **Browse** to locate the `lmgrd.exe` file.

   By default, the file is installed in the `..\Tekla\License\Server` folder.
4. Click **Save Service**.
5. Go to the **Start/Stop/Reread** tab and click **Stop Server**.
6. Click **Start Server** to restart the server.

   The changes are applied.

LMTOOLS does not show the licensing service status.

The status list on the **Server status** tab in **LMTOOLS** indicates that the license file cannot be found: "Error getting status: Cannot find license file. The license files (or license server system network addresses) attempted are listed below. Use LM_LICENSE_FILE to use a different license file, or contact your software provider for a license file".

Reason: You are trying to perform a status enquiry of a licensing service that is not running.

Solution: You need to start Tekla Licensing Service. Do the following:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.
2. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.
3. Go to the **Start/Stop/Reread** tab and click **Start Server**.
4. Go to the **Server Status** tab and click **Perform Status Enquiry** again.

See also

LMTOOLS options and settings used in Tekla licensing (page 435)

Install Tekla license server - manual installation (page 372)

Configure Tekla license server manually (page 377)

Problems in Tekla licensing: Error codes and their descriptions (page 426)

Problems in starting Tekla Structures

Tekla Structures does not start. The following message is displayed: "Error when connecting to the license server. Contact your system administrator or try another server".

Reason: You are not connected to the license server.

Solution: Check the following:

- Check that your network connection is working.
- Check that you have entered the license server name correctly.

  For more information, see Preconfigure license server settings for users (page 379).
- Check that license information in **LMTOOLS** is correct. If not, reread the license file in **LMTOOLS** and try to start Tekla Structures again.

  For more information about **LMTOOLS**, see LMTOOLS options and settings used in Tekla licensing (page 435).

Tekla Structures does not start. The following message is displayed: "License server system does not support this feature".

Reason: Your license server may not be up to date.

Solution: Update the status of your license server. Do the following:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system. Start **LMTOOLS** using administrator rights.
2. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.
3. On the **Start/Stop/Reread** tab, click **Stop Server** and wait a couple of seconds.
4. Click **Start Server**.
5. Start Tekla Structures.

If the problem still persists, contact your local Tekla Structures support. The support will need a copy of the following files: `tekla.lic`, `tekla.opt`, and `tekla_debug.log` files.

Tekla Structures does not start occasionally.

The following message is displayed: "Cannot connect to license server system. The license server manager (lmgrd) has not been started, the wrong port@host or license file is being used, or the port and hostname in the license file has been changed".

Reason: There may be communication problems between your license server and Tekla Structures client computers if the port of the license server is not defined.

Solution: Define the port for the license server. Do the following:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.
2. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.
3. On the license server computer, define a free port for the license server in the `tekla.lic` file. For more information, see Modify the license file tekla.lic manually (page 375).
4. Go to the **Start/Stop/Reread** tab and stop the license server by clicking **Stop Server**.
5. Click **Start Server**.
6. Start Tekla Structures on a client computer.
7. In Tekla Structures, click **Tools** --> **Change License Server** . Define the port and hostname of the license server.
8. Close Tekla Structures.
9. Repeat steps 5 to 7 on all Tekla Structures client computers.

See also

Preconfigure license server settings for users (page 379)

Problems in Tekla licensing: Error codes and their descriptions (page 426)

Problems with options file tekla.opt

The tekla.opt file does not take effect.

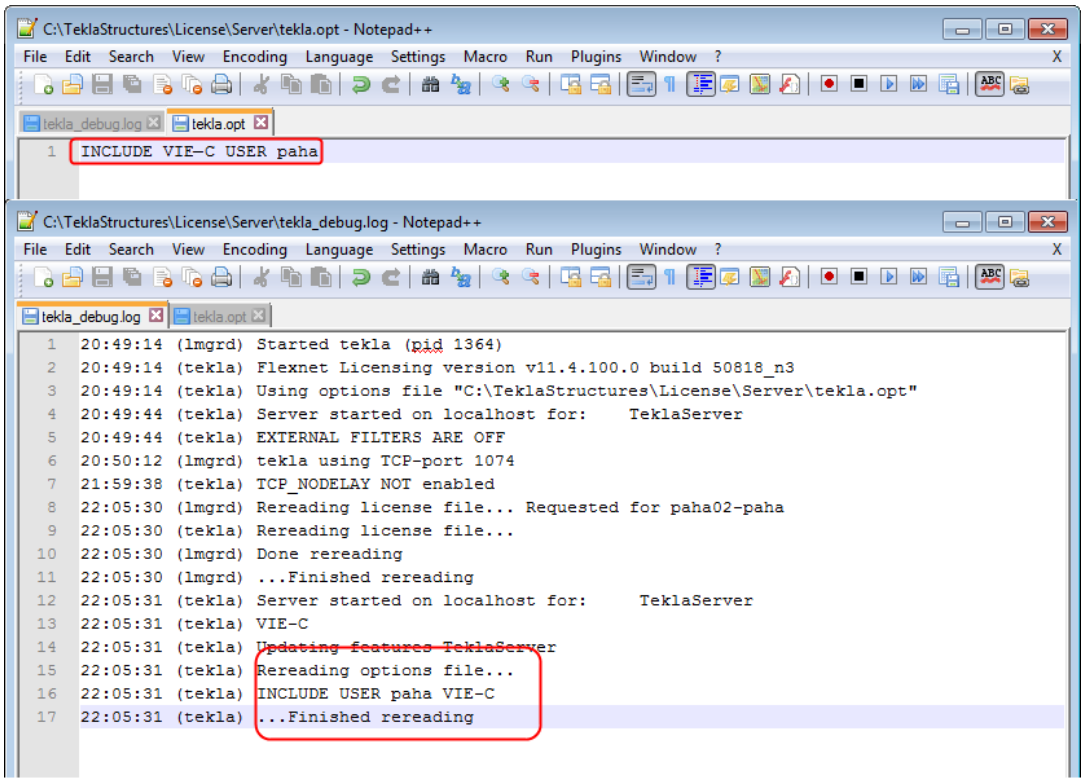
Reason: The licensing service has not read the options file.

Solution: Do the following:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.
2. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.
3. On the **Start/Stop/Reread** tab, click **ReRead License File**.
4. Browse to the `..\Tekla\License\Server` folder and open the `tekla_debug.log` file and the `tekla.opt` file with a text editor.

5. Check that the `tekla_debug.log` file contains the same keyword strings as the `tekla.opt` file.

   If this does not help, please contact your local support.



See also

Modify on-premises license access rights (tekla.opt) (page 397)

Problems in Tekla licensing: Error codes and their descriptions (page 426)

Problems in Tekla licensing: Error codes and their descriptions

Error 6

Problem: License library initialization failed with error: Activation Library Initialization error #6. Please, contact software vendor to resolve the problem.

Reason: Tekla license server installation folder contains `.dll` files that are from the previous Tekla license server version.

Solution: To resolve the problem, do the following:

1. Close Tekla License Administration Tool and stop the Tekla license server in **LMTOOLS** by clicking **Stop Server** on the **Start/Stop/Reread** tab.
2. Uninstall all existing Tekla license server installations.

3. If the Tekla license server installation folder contains any `.dll` files, remove the files manually.
4. Now you can install Tekla license server to the same folder where the uninstalled version was.

For more information about license server installation, see Installing Tekla on-premises license server (page 369).

NOTE Deactivation is not needed in this case. Licenses are kept safe in a specific Flexera Software location outside Tekla license server installation directory.

Error 20

Problem: Error 20: The licensing service is not installed.

Reason: The error occurs when you are starting Tekla License Administration Tool, or when you are trying to run `serveractutil.exe` command line tool.

Solution: If you selected the **Manual** option for Tekla Licensing Service installation then you need to manually install FLEXnet licensing service:

1. If you have some other FlexNet licensing service running on the server, stop it before entering the commands.
2. Go to the **Start** menu or **Start screen**, depending on your Windows operating system, and open **Command Prompt** as an administrator.
3. At the command prompt, type the following commands:

   ```
   cd /D full_path_to_installation_directory
   ```

   For example, if you install Tekla license server to the default folder, you need to enter `cd /D C:\Tekla\License\Server`.

   ```
   installanchorservice.exe
   ```

Error 109

Problem: There are no activated licenses to return. Another program may have modified the activated licenses rights concurrently. (109) Unable to return as there is no licenses in Trusted Storage.

Reason: The trusted storage has been modified, probably by some other program.

The red Restore (**R**) trust status of your license is not trusted. The license is broken, therefore it cannot be returned.

Solution: The license will become available on the server machine automatically when the borrow period ends.

Error 123 or error 50030

Problem: Message 1: Row n: An error occurred but FLEXnet Licensing did not return an error number. (123)

Message 2: Failed to load trusted storage or specified ASR. (50030)

Reason: These error messages indicate that the trusted storage cannot be loaded, and your trusted storage is corrupted.

Solution: Your licenses need to be replaced. Contact your local Tekla representative for a replacement along with some instructions.

Error 1316

Problem: License server installation fails.

The following message is displayed: "A network error occurred while attempting to read from the file `C:\Documents and Settings\<user>\Local Settings\Application Data\Downloaded Installations\...\Tekla Structures License Server v1.01.msi`".

Reason: You have an older version of the license server installed.

Solution: Uninstall the old version and then install the new version of the license server.

For more information about uninstalling the server, see Uninstall Tekla Structures.

Error 7109

Problem: License activation fails.

Reason 1: The emergency licenses are outdated.

Solution: Use a valid emergency license.

Reason 2: You tried to activate an entitlement for a Tekla Structures subscription using the Tekla License Administration Tool.

Solution: Activate the Tekla Structures subscription using the Tekla Online Admin Tool.

For more information, see Manage Tekla Structures subscriptions.

Error 7174

License activation fails, and the following message is displayed: "Unspecified FLEXnet Error with code 7174 Only deployed entitlement line item can be fulfilled."

Reason: You are trying to activate an obsolete license.

Solution: You should have received a new entitlement certificate from your local Tekla representative. Try the activation again with the new entitlement certificate, and move the old obsolete entitlement certificate in an archive folder.

For more information, see Activate on-premises licenses (page 390).

Error 7284

Problem: Unspecified FLEXnet Error with code 7284. Cannot perform support actions on inactive fulfillment record FID_xxxxxxxx_xxxxxxxxxxx__xxxx.

Reason: Trusted Storage has been restored from an old backup copy. The license with fulfillment ID FID_ xxxxxxxx_xxxxxxxxxxx__xxxx has been deactivated already.

Solution: You need to restore trusted storage files from the most recent backup copy and then repair licenses if needed.

For more information about repairing licenses, see Repair an on-premises license (page 403).

Error 7288 and error 111

Message 1: The activation of the fulfillment is denied by the activation policy because fulfill count exceeded the available seat count.

Message 2: The activation of the fulfillment is denied by the activation policy because number of copies left is zero.

Reason 1: You may be trying to activate some licenses that have been activated before on another server/computer.

Solution: Deactivate the licenses from the other computer, and then activate the licenses on the new server/computer.

Reason 2: You may be trying to activate a renewed temporary license or permanent licenses without deactivating the previous linked activated licenses.

Solution: Deactivate the existing temporary licenses first and then activate the succeeding linked licenses.

For more information about deactivating licenses, see Deactivate on-premises licenses (page 394).

Error 7343

Problem: Unspecified FLEXnet Error with code 7343 Entitlement line item has expired on <date> <time>.

Reason: License has expired. It is not possible to activate or repair expired licenses.

Error 7466

Problem: License deactivation fails, and the following message is displayed: "The return of the fulfillment is denied by the return policy because max return exceeded".

Reason: You have deactivated the license too many times in a 30 days period.

Solution: You can deactivate the license again when 30 days have passed since the first deactivation of the license in the past 30 days. The number of

deactivations of a license within a given time period is limited due to technical and security reasons.

Error 7581

Problem: Unspecified FLEXnet Error with code 7581. Online Return/Repair Request for the activationId XXXX-XXXX-XXXX-XXXX-XXXX-XX is not originated from the original client machine.

Reason and solution: The computer is not the same where the licenses were originally activated, and you need to return/repair licenses from the original computer. Another reason might be that the computer has changed so much that activation server at Trimble Solutions no longer recognizes it as the same one, in which case you need to replace your licenses.

For more information about returning and repairing licenses, see Returning a borrowed license (page 410) and Repair an on-premises license (page 403).

Error 9999

Problem 1: Cannot connect to the license server at Trimble Solutions

Reason 1: Licensing server at Trimble Solutions is down.

Solution: Wait for a while and retry.

Problem 2: Difficulties when trying to activate the license

Reason 2: The problem is related to long activation ID chains, which are typical for old licenses ordered for a long time ago for the first time. Typically, the license has been renewed for years without the need of a replacement of the license. Activation IDs may have been linked for a long time, which might cause a timeout when trying to activate the newest version of the license.

Solution: Your licenses need to be replaced. Contact your local Tekla representative for a replacement along with some instructions.

Error 50005

Problem: Error (5005) License Activation failed - Initialization of API Failed.

The activated licenses are not visible and it is not possible to activate new licenses.

Reason: The installation package has failed to initialize or register some of the software components.

Solution: Do the following:

1. Log in with administrator's rights.
2. Close Tekla License Administration Tool.
3. Stop Tekla license server and other license servers on the same computer on the **LMTOOLS** --> **Start/Stop/Reread** tab.
4. Go to `..\Tekla\License\Server` folder.

5. Double-click `installanchorservice.exe`.
6. Start Tekla license server and other license servers on the same computer on the **LMTOOLS** --> **Start/Stop/Reread** tab.
7. Open Tekla License Administration Tool. The message should not be displayed anymore.

Error 50018

Problem: License borrowing fails.

Reason: Wrong product ID file is used.

Solution: Do one of the following:

- Export a product ID file in Tekla License Administration Tool and use the file for borrowing.

Error 50033

Problem: License borrowing fails.

Reason 1: Your license server may not have up-to-date license information.

Solution: In **LMTOOLS**, stop and then restart the server.

Reason 2: The `INCLUDE` keyword in the options file prevents the borrowing of the configuration.

Solution: You need to add a dummy user "ACTIVATED LICENSE(S)" into the group of the included users to enable the borrowing. Do the following:

1. Open `tekla.opt` using a text editor.
2. Add `"ACTIVATED LICENSE(S)"` in the group of the included users, for example:

   ```
   GROUP steel "ACTIVATED LICENSE(S)" user1 user2 user3
   user4

   INCLUDE STD-C GROUP steel
   ```

3. Save the changes you made in `tekla.opt`.
4. In **LMTOOLS**, reread the license file or stop the server and then start the server.

Error 50035

Problem: License borrowing fails.

Reason: The user tried to borrow a license that is not activated on the license server. For example, the user tried to borrow a version 20 license and there are only version 21 licenses activated on the server.

Solution: Do the following:

- Check that the product ID file is up to date. If not, export a new product ID file in Tekla License Administration Tool (**File** --> **Export**) and send this file to the user for borrowing. Then ask the user to save the new product ID

file, open the Tekla License Borrow Tool, click **Open** and browse for the new `.tpi` file and try borrowing again.

- Check that your license information is up to date in **LMTOOLS**. If not, reread the license file.

Error 50036

Problem: License borrowing fails.

Reason: You are not allowed to borrow the license.

Solution: Do one of the following:

- The options file (`tekla.opt`) needs to be modified so that the borrowing of the license is allowed. For more information, see Modify on-premises license access rights (tekla.opt) (page 397).
- Borrow another license.

Error 50037

Problem: License returning fails.

Reason: You tried to return the license to a different license server than it was borrowed from.

Solution: You need to return the license to the same license server that it was borrowed from. Do the following:

1. Go to **Tekla License Borrow** --> **Tekla License Borrow Tool** through the **Start** menu or **Start screen**, depending on your Windows operating system.
2. Click **Setup** and enter the name of the license server where you originally borrowed the license from and click **OK**.
3. Select the **Return** check box in the **Borrowed Licenses** area to select the license for returning.
4. Click the **Return** button to return the license.

   After successful returning of licenses, the **Borrowed Licenses** area is updated.

Error 50040 or error 50041

Error 50040 or error 50041, problem 1: License activation, deactivation or repairing fails

Reason: Your license server was not able to connect to activation server at Trimble Solutions correctly. Usually this is a temporary problem in online activation.

Solution: Do the following:

- Check that your Internet connection is working. An Internet connection is needed during license activation and deactivation. A low connection speed may also cause errors.

- Close Tekla License Administration Tool and try to activate the license a while later.
- Try to activate another license.
- Your firewall may block the activation communication. Check your firewall settings. For more information, see Allowing Tekla on-premises license server to operate through Windows Firewall (page 380).
- Check that you have the latest Tekla license server version.
- This error could be caused by unfinalized Windows updates on the server computer. Reboot the server and try again.
- Your Windows login user name may contain special characters. Try to log in with another user name, for example, administrator.
- Check that your Internet connection is working.
- Contact your local Tekla Structures support and ask for a manual activation.

Error 50040 or error 50041, problem 2: License borrowing fails.

Reason: You are not connected to the license server.

Solution: Do the following:

- Check that your network connection is working.
- Start Tekla License Borrow Tool and check that you have entered the correct license server information.

See also

View and diagnose errors in Tekla Structures license activation, deactivation and borrowing (page 411)

Problems in Tekla license activation (page 415)

Problems in Tekla license borrowing (page 419)

Problems in Tekla license deactivation (page 419)

Licensing tools settings

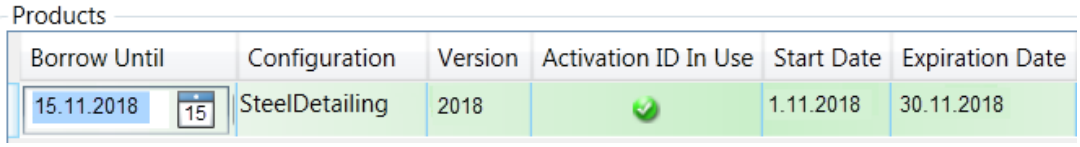
This section contains detailed reference information about the user interface of the following licensing tools:

- Tekla License Borrow Tool options and settings (page 433)
- LMTOOLS options and settings used in Tekla licensing (page 435)

Tekla License Borrow Tool options and settings

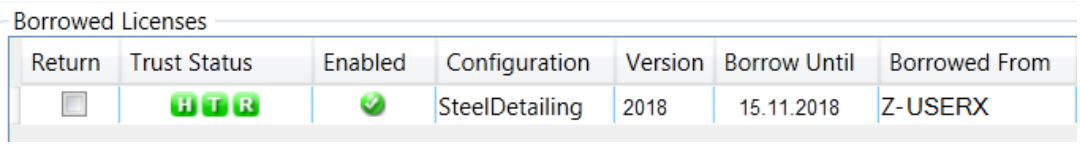
Tekla License Borrow Tool displays information about licenses that are available for borrowing and the licenses that have been borrowed. You can also borrow and return licenses

The **Products** area displays information on licenses, and allows you to set the expiration date for the license borrowing:



Option/ Setting	Description
Borrow Until	Select an expiration date for a borrowed license. One month is the maximum.
Configuration	The name of the configuration that you are borrowing.
Version	The version number of the configuration.
Activation ID In Use	Indicates whether the activation ID is used for borrowing. The box is selected only if you are using a customized and exported product ID file.
Start Date	The date when the license came into effect.
Expiration Date	The date when the license expires.

The **Borrowed Licenses** area displays information on borrowed licenses, and allows you to return borrowed licenses.



Option/ Setting	Description
Return	Used for returning licenses.
Trust Status	The Host (**H**), Time (**T**) and Restore (**R**) Trust Status. Green symbol indicates that information is trusted. Red symbol indicates that information is not trusted. If any of these are not trusted, the license cannot be used. • **Host** indicates whether the server has been moved from one computer to another or the computer hardware has radically changed. • **Time** indicates whether the system clock has been tampered with.

Option/ Setting	Description
	• **Restore** indicates whether the license is obtained from a backup copy.
Enabled	Indicates whether the license is enabled or disabled. For example, a license may be disabled if there is a disconnection during the borrowing. A disabled license cannot be used.
Configuration	The name of the configuration.
Version	The version number of the configuration.
Borrow Until	The date when the borrowing expires.
Borrowed From	The license server from where the license is borrowed.

See also

Set up on-premises license borrowing for offline use (page 404)

Problems in Tekla license borrowing (page 419)

Problems in Tekla licensing: Error codes and their descriptions (page 426)

View and diagnose errors in Tekla Structures license activation, deactivation and borrowing (page 411)

LMTOOLS options and settings used in Tekla licensing

LMTOOLS is a graphical user interface that allows you to administer the license server. This utility is provided by Flexera Software.

NOTE If you are using **FlexNet Manager** by Flexera Software for managing licenses, do not use **LMTOOLS**.

In addition to Tekla licenses, you can also manage licenses of other software that are using FlexNet or FLEXlm. You can also run **LMTOOLS** on client computers to check the status of the licenses on the license server.

Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.

Service/License File tab

Option/Setting	Description
Configuration using License File	Not used.
Configuration using Services	You must always have **Configuration using Services** and Tekla Licensing Service selected on the **Service/License File** tab when you manage Tekla licenses. These options are selected by

Option/Setting	Description
	default during the installation of the Tekla license server. If you need to configure the license server manually, see Configure Tekla license server manually (page 377).
LMTOOLS ignores license path environment variables	Not used.

System Settings tab

The **System Settings** tab displays common device and operating system information about the computer on which you are running **LMTOOLS**. All the relevant information on licensing is available. For example, you can check the hostname of your server computer.

Option/Setting	Description
Hostid Settings	**Computer/Hostname** **Username** **CPU ID** **IP Address** **Etnernet Address** **Disk Volume Serial Number** **FLEXID**
Time Settings	**System Time Zone** **GMT Time** **Difference from UTC** **MSDOS Time** **Local Time** **Windows Directory**
Save HOSTID info to a file	Save the hostid information to a text file.

Utilities tab

You can affect the information that is displayed in the status list on the **Server Status** tab by defining values on the **Utilities** tab. By default, the status list displays information about all the license servers you are connected to.

Option/Setting	Description
File Name	Find out the version of FlexNet Licensing linked with a file. Useful for diagnosing errors. Browse for the file and click **Find Version**.

Option/Setting	Description
Browse **Find Version**	
Vendor Name **Path** **Add Vendor Path** **Override Path** **List All Vendor Paths**	An example of the vendor name and path: **Vendor Name**: `tekla` **Path**: `27007@myserver` (port and license server computer name/hostname) The **Vendor Name** that is used for Tekla license server is `tekla` (all letters lowercase). Add a licensing service to be listed in the status list on the **Server Status** tab, enter the vendor information in the **Vendor Name** and **Path** boxes and click **Add Vendor Path**. If you want the status list to only display information on certain license servers, enter the vendor information in the **Vendor Name** and **Path** boxes and then click **Override Path** to replace the existing license servers displayed in the status list. The **List All Vendor Paths** button lists all the licensing services that are displayed in more detail in the status list on the **Server Status** tab.

Start/Stop/Reread tab

On the **Start/Stop/Reread** tab, you can stop and start the license server, and adjust some setting related to stopping the server.

NOTE When you perform actions concerning the Tekla license server, Tekla Licensing Service must be active in the **FlexNet license services installed on this computer** list. You can select Tekla Licensing Service from the services list on the **Service/License File** tab.

Option/Setting	Description
FlexNet license services installed on this computer	Lists all FlexNet license services available on the license server computer. Always ensure that Tekla Licensing Service is active in the **FlexNet license services installed on this computer** list when you perform actions concerning the Tekla license server. • Activate Tekla Licensing Service by selecting it from the services list on the **Service/License File** tab.

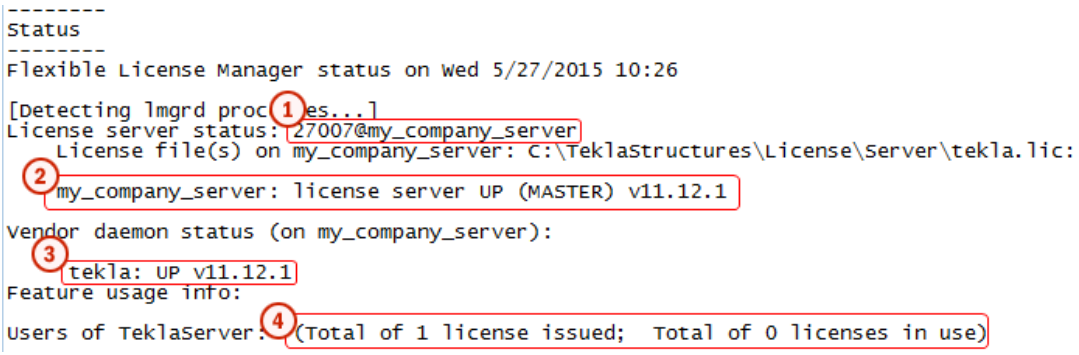
Option/Setting	Description
Start Server	Starts the license server that is active in the **FlexNet license services installed on this computer** list.
Stop Server	Stops the license server that is active in the **FlexNet license services installed on this computer** list. When you click the button, the status bar displays the message **Stopping the Server**, and it takes a couple of seconds to stop the license server. The message does not change when the server is stopped. If **Stop Server** does not stop the server, select the **Force Server Shutdown** check box and click **Stop Server** again.
ReRead License File	Updates the license server without stopping and starting it. You need to use this button, when you manually notify the license server about license changes. For more information, see Activate on-premises licenses (page 390) .
Advanced settings	
Restrict lmdown to work only from node where lmgrd is running.	When this option is selected, you can stop the server only on the server computer. No-one can accidentally stop the license server on a client computer. We recommend that you use this option.
Disable lmdown utility, use task manager.	When this option is selected, you cannot stop the server in **LMTOOLS**. The server can only be stopped in Windows Task Manager.
Disable 'lmremove' of license file.	Not in use in Tekla licensing.

Server Status tab

The **Server Status** tab displays the status of the license server and the licenses. Here you can check how many licenses are in use or borrowed, who is currently using licenses on the server and on which computers licenses have been borrowed.

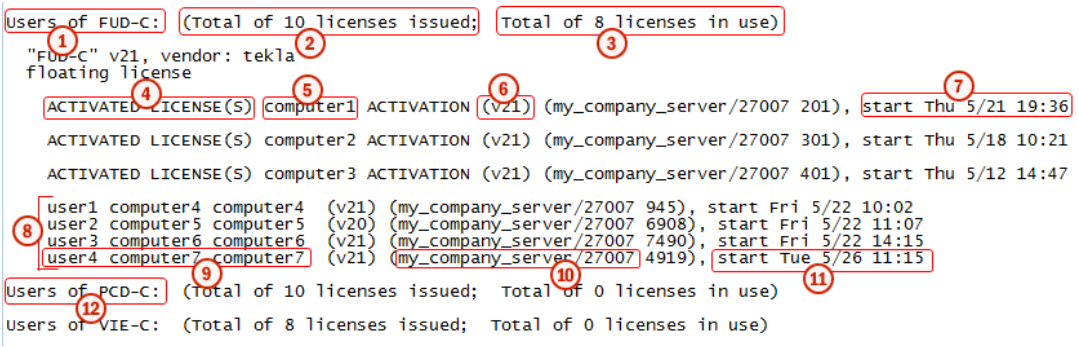
If you want to check the status of the Tekla license server and licenses only, enter `tekla` in the **Individual Daemon** box and click **Perform Status Enquiry**.

Below is an example of license server information:



1. The license server port@hostname
2. The license server is up and running
3. License server with Tekla identity is up and running
4. A default value for TeklaServer displayed in every status check

Below is an example of license information:



1. Indications the configuration for which license information is displayed. In this case, Full Detailing.
2. The number of activated licenses on the license server
3. The number of the licenses in use; checked out from the license server or borrowed
4. A borrowed license
5. On which computer the license was borrowed
6. Tekla license version
7. Time when the license was borrowed
8. Licenses checked out from the license server
9. On which computer and display the user has checked the license out. In this case, the user is user4, the computer and display names are computer7.
10. The license server hostname/port from where the license is checked out
11. Time when the Tekla Structures session was started

12. Usage of licenses of other configurations. In this case, Precast Concrete Detailing.

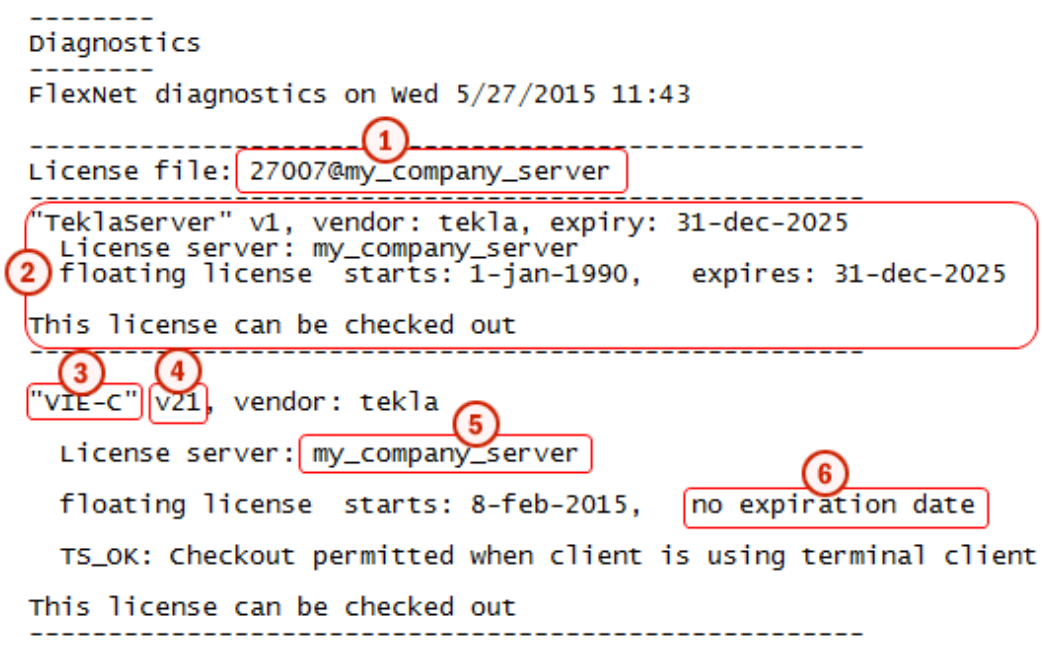
Server Diags tab

The **Server Diags** tab shows more information about the license servers and licenses, and provides diagnostics.

NOTE If you have problems with the license server, send a copy of the `tekla.lic`, `tekla.opt`, and `tekla_debug.log` files to your local Tekla Structures support. The information on the **Server Diags** tab is not detailed enough to solve some of the problems.

- To display the diagnostics, click **Perform Diagnostics**.

Below is an example of the **LMTOOLS** license server and license diagnostics:



1. The license server port@hostname
2. Common information for all Tekla license server installations
3. On which configuration the information is displayed. In this case it is Viewer.
4. Tekla license version
5. The license server hostname
6. The expiration date of the license. In this case, the license is permanent.

Config services tab

The values on the **Config Services** tab are filled in automatically during the installation of the Tekla license server. However, if you encounter problems

during the installation and the license server does not start automatically, you need to configure the settings manually on the **Config Services** tab.

For more information about the data you should add/select on this tab, see Configure Tekla license server manually (page 377).

NOTE Whenever you make modifications or perform any actions in **LMTOOLS** concerning the Tekla license server, you need to have Tekla Licensing Service selected in the **Service Name** list.

Borrowing tab

WARNING Use Tekla License Borrow Tool for borrowing Tekla licenses. Do not use the Borrowing tab of **LMTOOLS** with Tekla licenses.

5.4 Tekla Structures upgrades for administrators

To upgrade Tekla Structures, you can install service packs or a new Tekla Structures version.

You can install service packs on top of the existing installation of Tekla Structures. You can upgrade to new service packs without updating the existing Tekla Structures subscription or legacy on-premises license.

Each new Tekla Structures version is installed as a separate app. You can install a new Tekla Structures version on the same computer as other Tekla Structures versions.

Tekla Structures subscriptions automatically allow you to use any Tekla Structures version that is released during your subscription period. If you have legacy on-premises licenses, the licenses have a newest allowed version. You must update your legacy on-premises licenses when you upgrade to a version that is newer than the newest allowed version.

If you already have an older version of Tekla Structures installed on your computer, you can use the Migration Wizard to copy your personal settings to the new version.

When you customize Tekla Structures, we strongly recommend that you create project and firm folders (page 16) for the customized files. If you have customized previous Tekla Structures versions without using firm or project folders, you must transfer the customized information to the next Tekla Structures version.

Before you start using a new Tekla Structures version, always test that the previous company settings (page 34) work.

5.5 Printer settings

Tekla Structures uses Windows drivers to write the print data directly to the Windows print device interface.

You print drawings as a PDF file, save them as a plot file (`.plt`) for printing with a printer or plotter, or print them on a selected printer.

To print to several paper sizes, you must modify the . You can also change the line width of the printed drawings.

You can use advanced options specific to the drawing type to define how Tekla Structures automatically names `.pdf` files and `.plt` files.

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