



Manage Tekla Structures Tekla Structures 2026

March 2026

©2026 Trimble Inc. and affiliates



Contents

1	Manage Tekla Structures	9
1.1	Before you start using Tekla Structures.....	9
1.2	Get started with managing Tekla Structures in an enterprise company.....	9
1.3	Get started with managing Tekla Structures in a small or medium company.....	10
1.4	Get started with managing Tekla Structures as an individual user.....	11
2	Plan the installation and set up Tekla Structures.....	12
2.1	Tekla Structures installation requirements.....	12
2.2	Overview of environments, roles, and configurations in Tekla Structures.....	13
2.3	Folder structure for Tekla Structures installation.....	14
	Hidden files and folders for Tekla Structures.....	15
	Company folder structure.....	16
	Backing up important Tekla Structures folders.....	16
	Virus protection and Tekla Structures folders.....	17
2.4	Project and firm folders.....	17
	Benefits of the project and firm folders.....	18
	Advanced options for defining the project and firm folders.....	18
	Create a project or firm folder.....	19
	Example of using a firm folder.....	19
	Fixed sub-folders in project and firm folders.....	20
2.5	Use a Trimble Connect project as the project or the firm folder.....	23
	Set a folder in a Trimble Connect project as XS_PROJECT.....	25
	Set a folder in a Trimble Connect project as XS_FIRM.....	25
2.6	Tekla Structures installation for administrators.....	27
	Tekla Structures installation on workstations.....	27
	Installation files for Tekla Structures software and environments.....	27
	Standard Tekla Structures installation.....	27
	Centralized Tekla Structures installation.....	28
	Tekla Structures installation in a virtual environment.....	28
2.7	Tekla Structures upgrades for administrators.....	28
	Update model templates for the new Tekla Structures version.....	28
	Applications & components catalog maintenance after a Tekla Structures upgrade...	33
	Update your customized ribbon for the new Tekla Structures version.....	35
2.8	Install and manage .tsep extensions.....	35
	Import .tsep extensions using Tekla Structures extension manager in the Applications & components catalog.....	36
	Install .tsep extensions directly from the file system.....	36
	Install .tsep extensions automatically from a shared folder.....	37
	Install .tsep extensions centrally.....	38

	Update installed extensions.....	39
	Copy .tsep extensions to a new Tekla Structures version.....	39
	Remove .tsep extensions using Tekla Structures extension manager	39
	Remove .tsep extensions using Tekla Structures Extension Package (TSEP) builder and test runner.....	40
	Remove .tsep extensions centrally.....	40
2.9	Use Tekla Structures with application and desktop virtualization.....	40
	Prerequisites for using Tekla Structures in a virtual environment.....	41
	Set up the virtual environment for Tekla Structures.....	42
3	Customize Tekla Structures for users.....	44
3.1	Project Settings Management Console (Preview).....	45
3.2	Hierarchy of Tekla Structures settings.....	45
	Environment settings for administrators.....	47
	Common environment settings.....	47
	Country-specific environment settings.....	47
	Company settings for administrators.....	47
	Customization of model templates.....	48
	Update model templates.....	49
	Customization of reports and drawings.....	50
	Create cloning templates for drawings.....	50
3.3	Distribute customized ribbons by using a firm or environment folder... ..	51
	Add ribbons to a firm or environment folder.....	51
	Loading order of custom ribbons.....	52
	Naming convention for ribbon files.....	52
3.4	Distribute customized tabs by using a firm or environment folder.....	53
3.5	Distribute customized property pane layouts by using a project, firm, or environment folder.....	55
	Add a property pane layout file in a project, firm, or environment folder.....	55
	Search order of customized property pane layout files.....	56
3.6	Distribute customized property pane settings by using a project, firm, or environment folder.....	56
3.7	Distribute customized toolbars by using a project, firm, or environment folder.....	57
3.8	Files for configuring Tekla Structures.....	57
	Folder search order.....	58
	Check and change Tekla Structures file and folder locations in Directory browser.....	61
	Initialization files for start-up parameters and default settings.....	62
	Typical initialization files (.ini files) and their reading order.....	62
	Global default environment settings - env_global_default.ini.....	68
	Local environment settings - env_<environment>.ini.....	69
	Role settings - role_<role>.ini.....	69
	Add an advanced option to the user.ini file.....	70
	Input files (.inp files) for configuring Tekla Structures.....	72
	Show plates as flat bars in drawings and reports.....	73
	Define materials, thickness, and width of flat bars in the Fltprops.inp file.....	73
	Define unfolding parameters in the unfold_corner_ratios.inp file.....	75
	Data files (.dat files) for configuring Tekla Structures.....	89
	Customize user interface text in message files.....	91
	Customize message files.....	91
	Customize object properties and settings in property files.....	92

Save a user-defined property file in the property pane	92
Save a user-defined property file in a dialog.....	93
Standard files.....	93
How properties are loaded from standard files.....	93
Save a set of standard files.....	94
Create user-defined standard files.....	95
Files related to catalogs.....	96
Font files for customizing Tekla Structures.....	98
Symbol files for drawings.....	99
Files related to templates, reports and drawings.....	99
DWG reference model plug-in configuration settings.....	100
Supported image file formats in Tekla Structures.....	101
Log files about the operation of Tekla Structures.....	102
View a log file.....	105
Change the name and location of session history log file.....	106
Numbering history log file.....	107
Numbering series in the numbering history log file.....	108
Files and file name extensions in the Tekla Structures model folder.....	110
Files in the Tekla Structures model folder.....	110
Files in the \Analysis folder.....	113
Files in the \attributes folder.....	114
Tekla PowerFab export settings in the \attributes folder.....	120
Component properties files in the \attributes folder.....	121
Object-level drawing settings saved in the \attributes folder.....	121
View-level drawing settings saved in the \attributes folder.....	122
Files related to drawing level properties for single-part drawings saved in \attributes folder.....	123
Files related to drawing level properties for assembly drawings saved in the \attributes folder.....	124
Files related to drawing level properties for cast unit drawings saved in the \attributes folder.....	126
Files related to drawing level properties for general arrangement drawings saved in the \attributes folder.....	127
Files related to drawing level properties for multidrawings saved in the \attributes folder.....	129
Files common to all drawings and files in the \drawings folder.....	130
Files created in the \DataStorage\ref folder.....	130
Files created in the \Plotfiles folder.....	131
Files created in the \DGN folder.....	131
Files created in the \Drawing Details folder.....	131
Files related to IFC export in the \IFC folder.....	131
Files related to NC (numerical control) in the \DSTV_Profiles folder.....	131
Files in the \ModelSharing folder.....	131
Files in the \ProjectOrganizer folder.....	132
Files related to reports in the \Reports folder.....	132
Files in the \SessionFileRepository folder.....	132
Files related to shapes in the \ShapeGeometries and \Shapes folders.....	132
Files in the \screenshots folder.....	132
Files related to Unitechnik export in the \UT_files folder.....	133
Files related to options and advanced options.....	133
About model-specific options and advanced options.....	133
When you change model-specific options or advanced options.....	133
What happens when you change user-specific options or advanced options.....	134
Create a list of advanced options and their values.....	134
Settings in the Options dialog.....	134

	Change units and decimals.....	154
	Settings defined by advanced options.....	155
	Tekla Structures settings in the Windows registry.....	157
	User settings in the Windows registry.....	157
	Installation settings in the Windows registry.....	157
3.9	Develop applications using Tekla Open API.....	157
4	Start new projects as a Tekla Structures administrator.....	159
4.1	Start the first project.....	159
4.2	Start new projects.....	160
4.3	Define project properties.....	160
4.4	Reuse files and settings from previous projects or Tekla Structures versions.....	161
	Check advanced options for the project and firm folders.....	161
	Manually transfer files and settings to a new project.....	161
	Import Tekla Structures model and drawings into another model.....	162
4.5	Define and update user-defined attributes (UDAs).....	164
	About creating new user-defined attributes.....	165
	Best practice for user-defined attribute names.....	165
	Best practices for user-defined attribute definitions.....	165
	Best practices for user-defined attribute translations.....	166
	Search order of objects.inp files.....	166
	If you need to change existing user-defined attribute definitions.....	167
	Update definitions of user-defined attributes (UDAs) in a model.....	167
	Environment database file.....	167
	Example: Create and update a user-defined attribute (UDA).....	168
	Add UDAs in reference models.....	171
	Properties of objects.inp files.....	173
	General properties.....	173
	Picture properties.....	176
	Value types in user-defined attributes.....	176
	Examples of value types in user-defined attributes.....	179
	Copy settings for part UDA.....	180
	About the tab_page property.....	181
4.6	Templates.....	181
	Template Editor User's Guide.....	184
	Create a textual template.....	184
	Example: Create a template for nested assemblies.....	194
	Create a graphical template.....	198
		198
	Control font height metric in graphical templates.....	207
	Create a template in HTML format.....	210
	Create a .pdf report template.....	212
	Create a template for bending schedules or pull-out pictures	215
	Autoscaling pull-out pictures.....	218
	Changing the appearance of pull-out pictures.....	219
	Bending schedule attributes.....	219
	Create a title block from a DWG file.....	221
	Before importing a DWG title block.....	221
	Import and modify a DWG title block.....	221
	Add images in a template.....	227
	Content types in templates.....	230

	Template attribute files (contentattributes.lst).....	233
	User-defined template attributes.....	235
	Example: Add user-defined template attributes to the Template Editor.....	236
	Add comments to user-defined template attributes.....	237
	Add hierarchy to user-defined template attributes.....	238
	Tips for templates	239
	Using type attributes in calculations.....	239
	Change value field content to use imperial units.....	239
	Define customized date format.....	240
	Assembly or cast unit drawing sheet number.....	240
	Use format functions in value fields.....	241
	Solve performance issues.....	244
4.7	Set up a project for collaboration and interoperability.....	244
	Checklist for interoperabilitySet up a project for collaboration and interoperability.....	244
	Collaborative modeling for administrators.....	245
	Management of Tekla Model Sharing.....	245
	Install the cache service for Tekla Model Sharing.....	245
	Host your own potree point cloud data.....	250
	Create a potree file with Point cloud manager.....	250
	Configure an Azure Storage Account to host the point cloud data.....	251
	Upload potree data to your Azure Storage Account.....	253
	Add a link to your point cloud data to your Trimble Connect Project.....	253
	Files for import and export.....	254
	Conversion files.....	254
	Create property sets for IFC export.....	258
	DSTV file description.....	270
	tekla_dstv2dxf_<env>.def file description	272
	ASCII file description.....	282
4.8	Customize catalogs and databases.....	285
	Additional content in Tekla Warehouse.....	285
	Customize the material catalog.....	285
	Important buttons in the material catalog.....	286
	Add a material grade.....	286
	Copy a material grade.....	287
	Modify a material grade.....	287
	Delete a material grade.....	288
	Add user attributes to material grades.....	288
	Create user-defined material definitions.....	289
	About importing and exporting material grades.....	290
	Export a part of the material catalog.....	290
	Export an entire material catalog.....	291
	Import a material catalog.....	291
	Units used in import and export.....	292
	Customize the new profile catalog.....	293
	Convert rules from the original profile catalog to groups in the new profile catalog	293
	Filter and sort the profile catalog.....	294
	Show only fabricator profiles.....	294
	Create groups in the profile catalog.....	295
	Create sub-groups in the profile catalog.....	295
	Add profiles to groups in the profile catalog.....	296
	Remove profiles from groups in the profile catalog.....	296
	Rename groups in the profile catalog.....	297
	Share groups in the profile catalog.....	297
	Delete groups from the profile catalog.....	297

Add tags to profiles in the profile catalog.....	298
Add stars to profiles in the profile catalog.....	298
Rename profiles in the profile catalog.....	299
Add or edit user-defined attributes for profiles.....	299
Delete profiles from the profile catalog.....	300
Find issues in the profile catalog using profile database inspection.....	300
Import and export profiles in the new profile catalog.....	301
Customize the original profile catalog.....	307
Re-enable the original profile catalog.....	307
Important buttons in the profile catalog.....	307
How profiles are grouped together.....	308
Add a rule to the profile catalog.....	308
Modify a rule in the profile catalog.....	309
Add user attributes to profiles.....	309
Associate profile types with a certain material.....	312
Delete a profile from the profile catalog.....	313
Import and export profiles in the original profile catalog.....	314
Create your own profiles.....	319
Create user-defined cross sections in profiles.....	320
Create fixed profiles in the original profile catalog.....	330
Create parametric profiles using .clb files.....	334
Create parametric profiles by sketching.....	341
Create parametric profiles with variable cross sections.....	367
Define standardized values for parametric profiles.....	370
Create an image of a profile.....	371
Customize the shape catalog.....	372
Create shapes.....	373
Organize shapes and groups in the shape catalog.....	374
Organize the shape catalog view.....	382
Import shapes into Tekla Structures.....	386
Export shapes.....	389
Compress shape geometry files.....	391
Clean or restore shape geometry files.....	392
Customize the bolt catalog.....	393
How the bolt catalog and bolt assembly catalogs work together	394
Manage bolts and bolt assemblies.....	394
Import and export bolts and bolt assemblies.....	398
How bolt and bolt assembly catalogs affect length calculation.....	402
Bolt catalog properties.....	405
Bolt assembly catalog properties.....	407
Customize the rebar catalog.....	408
Work with definitions in the rebar catalog.....	409
Work with groups in the rebar catalog.....	411
Import and export rebar definitions.....	413
Organize the rebar catalog view.....	414
Customize the Applications & components catalog.....	419
Edit the Applications & components catalog.....	420
Maintain the Applications & components catalog.....	424
Create your own component folder.....	425
Publish a group in the Applications & components catalog.....	426
Troubleshooting components or groups in the Applications & components catalog.....	428
Add instructor help for applications and components.....	428
4.9 Create customized desktop shortcuts for Tekla Structures.....	430
Create a desktop shortcut for Tekla Structures with customized initializations.....	430

	Available parameters in desktop shortcuts for Tekla Structures.....	432
	Example of an initialization file.....	433
	Bypass the sign in dialog.....	434
5	Daily management of Tekla Structures.....	436
5.1	Management of the company's account for Tekla products and services.....	436
5.2	Management of Tekla Structures subscriptions.....	437
5.3	Tekla Structures upgrades for administrators.....	437
5.4	AI Cloud Fabrication drawings (Preview): Make a drawing collection public.....	438
	Make a fabrication drawing collection public.....	438
6	Disclaimer.....	440

1 Manage Tekla Structures

Managing Tekla Structures means customizing and deploying Tekla Structures for users in your company 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 company.
- 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, including Tekla 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 \(page 44\)](#) and distribute the customizations to users in your company.
3. [Set up new projects \(page 159\)](#).

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 \(page 26\)](#) for Tekla Structures.
2. [Manage the users in your company's account \(page 436\)](#) for Tekla products and services, and your [subscriptions \(page 437\)](#).
3. [Deploy for users \(page 26\)](#).

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 company's account for Tekla products and services.

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

1. [Plan how you will install \(page 12\)](#) and [deploy Tekla Structures for users \(page 26\)](#).
2. [Manage the users in your company's account \(page 436\)](#) for Tekla products and services, and your [subscriptions \(page 437\)](#).
3. [Customize \(page 44\)](#) and distribute the customizations to users in your company.
4. [Set up new projects \(page 159\)](#).

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 \(page 57\)](#).

The typical workflow for an individual user is:

1. Install Tekla Structures.
2. [Customize \(page 44\)](#) for your projects and way of working.
3. [Create templates \(page 181\)](#).
4. Check your settings in the [advanced options \(page 133\)](#).

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. See [Tekla Structures installation for administrators \(page 26\)](#).
- Which Tekla Structures environments you will use. See [Overview of environments, roles, and configurations in Tekla Structures \(page 13\)](#).
- How you will use the [Project and firm folders \(page 17\)](#) to store customized settings.
- [Overview of environments, roles, and configurations in Tekla Structures \(page 13\)](#)
- Folder structure for Tekla Structures installation
- Project and firm folders
- Use a Trimble Connect project as the project or the firm folder
- Tekla Structures installation for administrators
- Tekla Structures upgrades for administrators
- Install and manage .tsep extensions
- Use Tekla Structures with application and desktop virtualization

2.1 Tekla Structures installation requirements

For information about recommended operating system and hardware specifications, see the hardware recommendations.

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:

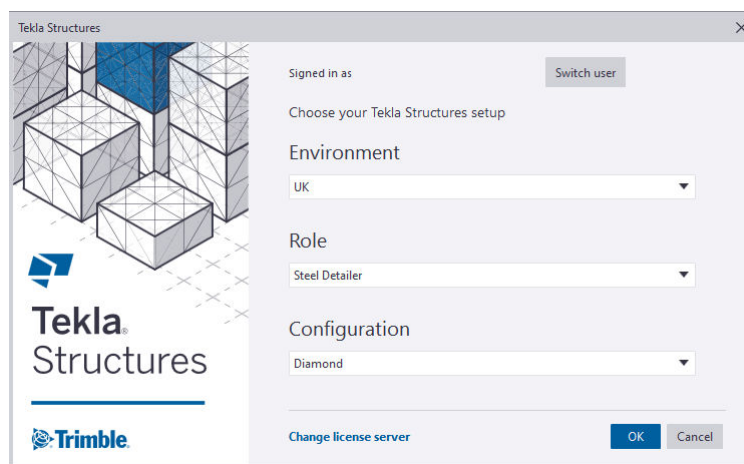
- Tsep File Dispatcher Launcher
- Tekla Warehouse Service

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 for use in their company. Additional content is available in Tekla Warehouse.

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 \(page 45\)](#)

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 \(page 17\)](#) 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.

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.

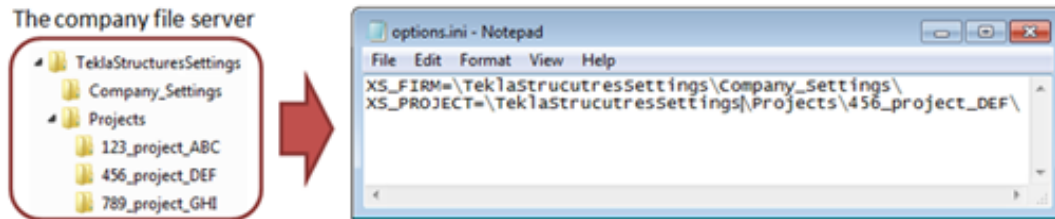
You can use the same files each time you start a new model or install a new version of Tekla Structures.

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 company. The settings and files in the firm folder are meant to be used in all projects within the company. For example, if a company has specific drawing layout standards, you can customize the drawing templates and save them in 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.ccl* 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 or in the `options.ini` file located in model folder; not from an `options.ini` file located in folders defined for the advanced options `XS_FIRM` or `XS_PROJECT`. 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 but have been added in the software.

Create a project or firm folder

The firm and project folders are usually located network folders or on a shared file server that all users at the company can access.

NOTE Alternatively, you can use a [Trimble Connect project \(page 23\)](#) as the project or the firm folder. You can use the settings stored in a Trimble Connect project for single-user, multi-user, or Tekla Model Sharing models.

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 as the value of the `XS_FIRM` or `XS_PROJECT` advanced option.
4. Restart Tekla Structures for the change to take effect.

Example of using a firm folder

This example shows how to set up a firm folder, and set the value of the `XS_FIRM` advanced option so that Tekla Structures uses the settings in the firm folder.

1. In a shared location, such as a network drive, create a folder named `Firm`.
You can give the folder any name. This example uses the name `Firm`.
2. In the firm folder, create an initialization file.
You can use this file to set advanced options for each model.
 - a. In a text editor, create a text file.
 - b. Add this advanced option to the file:

```
set XS_USE_ASSEMBLY_NUMBER_FOR=MAIN_PART
```
 - c. Save the file as `firm.ini` in the `Firm` folder.
3. Set the value of the `XS_FIRM` advanced option so that Tekla Structures uses the firm folder.

- a. In Tekla Structures, go to the **File** menu and select **Settings --> Advanced options**.
 - b. In the **File locations** category, define the path to the firm folder as the value of the XS_FIRM advanced option. For example, \network-drive\TeklaStructures\Company-Settings\Firm\
4. Restart Tekla Structures for the change to take effect.
5. To verify that Tekla Structures is using the settings from the firm folder, check the value of the XS_USE_ASSEMBLY_NUMBER_FOR advanced option.
 - a. In Tekla Structures, go to the **File** menu and select **Settings --> Advanced options**.
 - b. In the **Numbering** category, check that the value of the XS_USE_ASSEMBLY_NUMBER_FOR advanced option is MAIN_PART.

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 property set configuration files for IFC export in the .xml format.	• Create new property sets for IFC export (page 258)
\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 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 372)
\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 55)
\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 Use a Trimble Connect project as the project or the firm folder

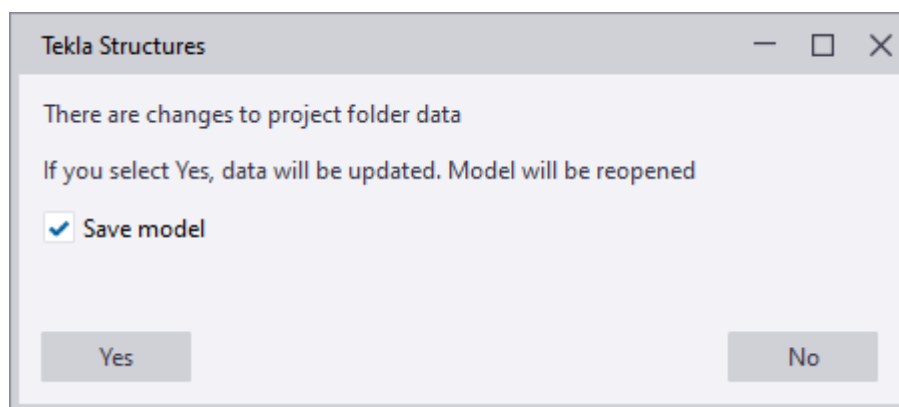
You can use a Trimble Connect project as the project or the firm folder to store customized files. Using Trimble Connect project to set up XS_PROJECT

and `XS_FIRM` is often the most convenient way to store the customized files. Especially, when multiple licenses are used in one company, and you want to ensure that users always use the same settings and that the updates are automatically shared with everyone. You can use the settings stored in a Trimble Connect project for single-user, multi-user, or Tekla Model Sharing models.

When a model is opened, Tekla Structures checks the file differences between the files in the Trimble Connect project folder and in the local `..\Users\<user>\AppData\Local\Trimble\tekla folder sync\` folder. The project and firm folder information is updated from Trimble Connect to local versions of the models, not vice versa.

In practice, this means that Tekla Structures downloads new files from the project or firm 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.

When Tekla Structures detects a change between the local model data and the data in the Trimble Connect project or firm folder, the following notification appears:



If you click **Yes**, the model is saved and closed. Then, the local model data is updated and the model is re-opened.

Tekla Structures uses Trimble Connect folder sync (`CONNECT_FOLDER_SYNC`) to synchronize the data.

For more detailed information on how to create the Trimble Connect project and folders, see [Video: How to use a Trimble Connect folder as the project or firm folder](#) and [Using Trimble Connect files in Tekla Structures](#).

Note that

- if you use the Trimble Connect project and firm folders with Tekla Model Sharing, all users need to have access both to the Trimble Connect project and to the Tekla Model Sharing model.
- 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.

Set a folder in a Trimble Connect project as XS_PROJECT

1. Create a Tekla Structures model.
2. To link the model to a Trimble Connect project, on the **File** menu, go to **Trimble Connect** --> **Start collaboration**, select the needed options and click **Create**.

The model is linked to the selected Trimble Connect project.

3. To open the Trimble Connect project explorer, on the Trimble Connect ribbon tab, click **For browser** --> **Project explorer**.
4. Create a folder that you want to use as a project folder to the Trimble Connect project.

Add the needed settings and files to the folder.

5. In Tekla Structures, on the **File** menu, go to **Settings** --> **Advanced options**, and find the XS_PROJECT advanced option.
6. Set the value of XS_PROJECT to %CONNECT_FOLDER_SYNC%<folder>, where the folder is the Trimble Connect project 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 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.

7. Click **OK**.
8. Restart Tekla Structures for the change to take effect.
9. When you open the model, a notification about the changes in project folder data appears. Click **Yes**.

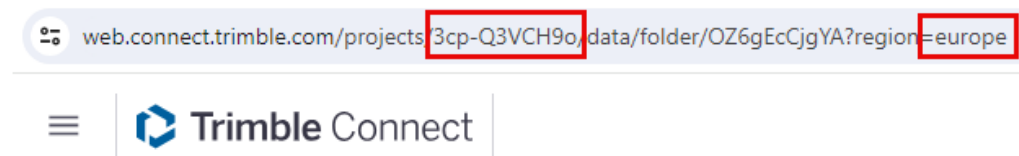
Set a folder in a Trimble Connect project as XS_FIRM

1. Create a Tekla Structures model.
2. Open the Trimble Connect project that you want to use as firm folder.
3. Create a folder that you want to use as a firm folder to the Trimble Connect project.

Add the needed settings and files to the folder or in the sub-folder.

4. Find out the project identifier and the region of the project.

You can see the project identifier and the region in Trimble Connect for Browser:



The region is the same as the project server location setting. The options are:

- asia
- europe
- northAmerica
- australia

5. In Tekla Structures, on the **File** menu, go to **Settings --> Advanced options**, and find the `XS_FIRM` advanced option.
6. Set the value of `XS_FIRM` to `%CONNECT_FOLDER_SYNC%\<ProjectID>\<region>(\<folder>\<sub-folder of the folder>)`.

For example, the value could be `%CONNECT_FOLDER_SYNC%\3cp-Q3VCH9o\europe`.

Note that the path works whether you use a `\` separator between the project ID and the region (`%CONNECT_FOLDER_SYNC%\<ProjectID>\<region>`), or whether you leave the separator out (`%CONNECT_FOLDER_SYNC%\<ProjectID><region>`)

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%\3cp-Q3VCH9o\europe\Project Settings\Project`. You can also use lower level sub-folders.

7. Click **OK**.
8. Restart Tekla Structures for the change to take effect.
9. When you open the model, a notification about the changes in project folder data appears. Click **Yes**.

2.6 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.

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 [Trimble 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.

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. 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.

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 dialogs. For detailed information about centralized installation, see [Centralized distribution of Tekla Structures 2026](#).

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 \(page 40\)](#).

2.7 Tekla Structures upgrades for administrators

When you upgrade to a new version of Tekla Structures, update your customizations for the new version.

Update model templates for the new Tekla Structures version

When you upgrade to a new version of Tekla Structures, update your model templates.

NOTE If you have model templates in Tekla Warehouse, also remember to update them.

1. Open the new version of Tekla Structures.
2. Create a new model using an existing model template.
3. Give the model the same name as in the previous Tekla Structures version.

Recent All models Shared models New

Name:
 Create

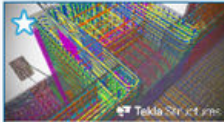
Place in:
 Browse...

☒ Single-user
☐ Multi-user
☒ Start Trimble Connect collaboration

Template
☐ Show hidden items (0)

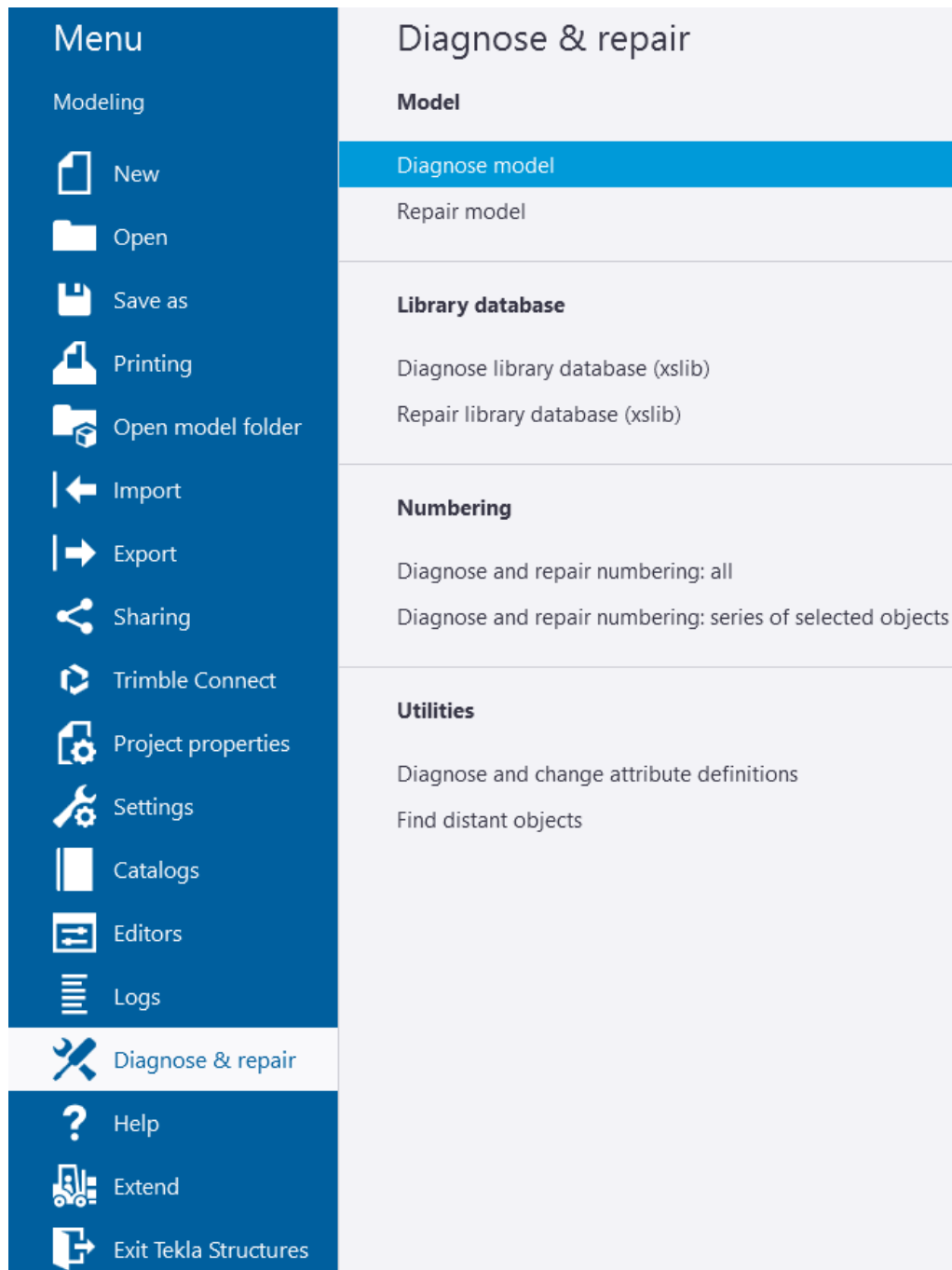


Blank



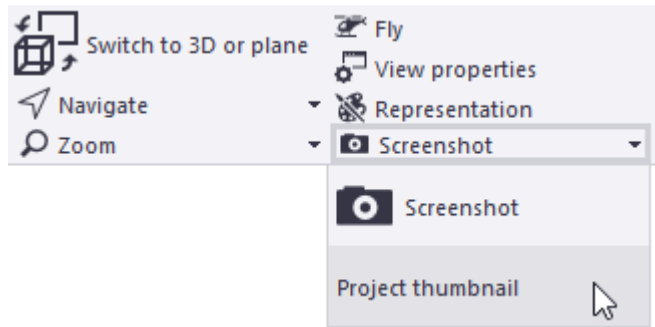
Cast-in-Place

4. Open a 3D view.
5. Diagnose and repair the model.



6. Create a project thumbnail, or add a custom image named `thumbnail.png` in the model folder.

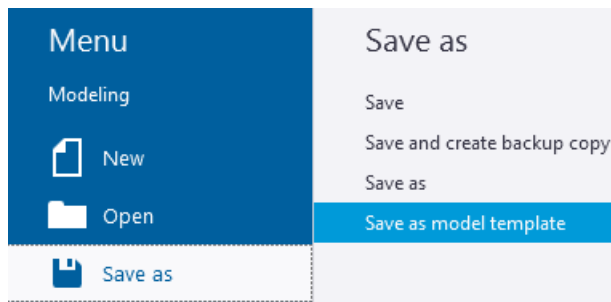
The preferred size of the image is 120 × 74 pixels.



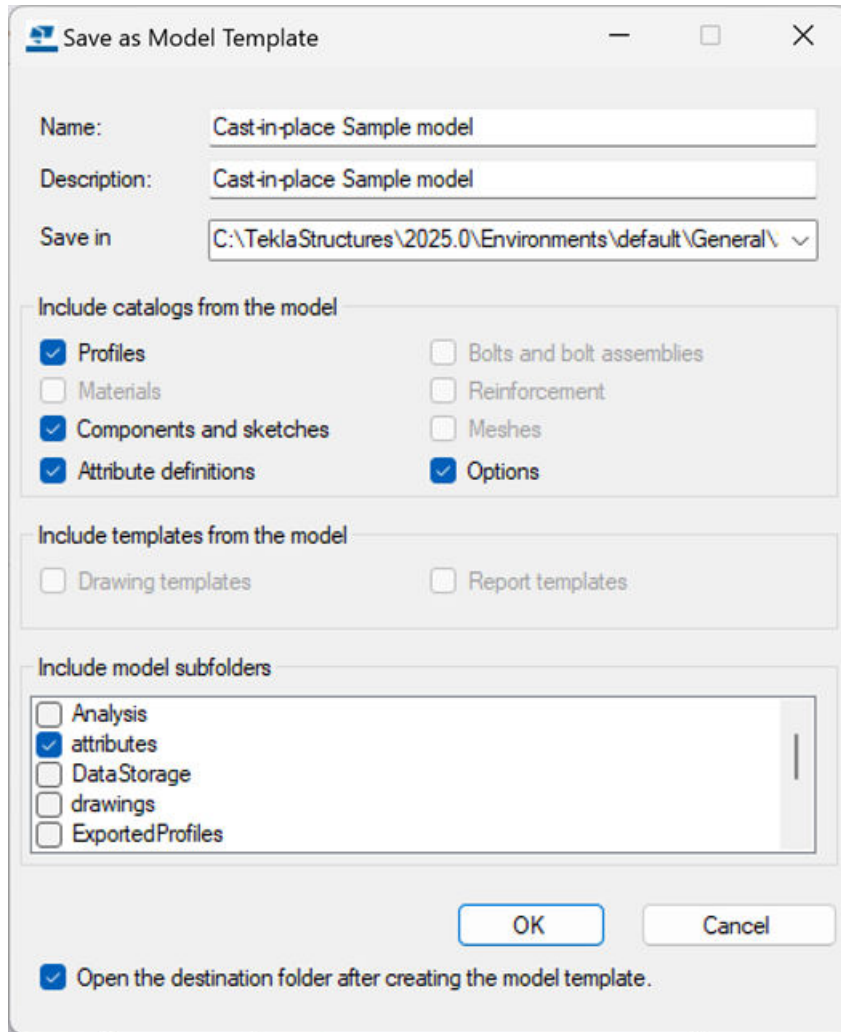
7. Save the model.

If you do not save the model, a message that warns about the model being created with a previous version might be shown.

8. Save the model as a model template.



9. Include the needed catalog files and subfolders from the model folder, and click **OK**.



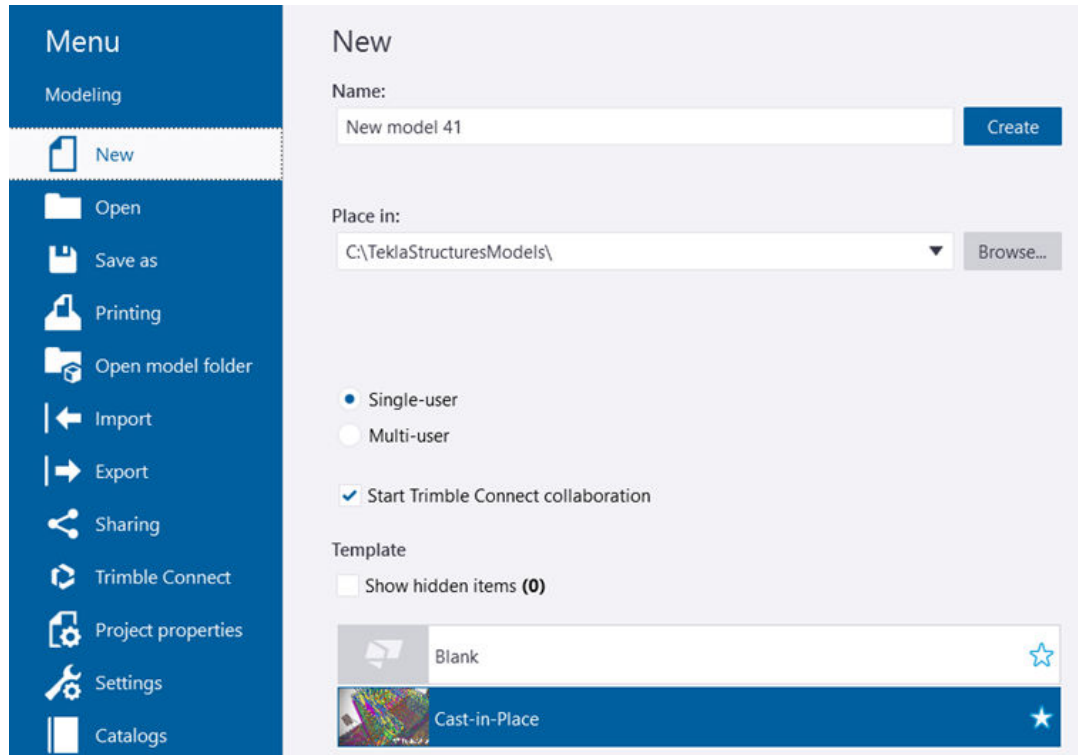
10. Manually remove all *.db files (environment database, options databases) from the model folder.

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

The .idrm files (db.idrm and xslib.idrm) should be kept as they are part of the model.

The model template is saved in the location specified 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.



Applications & components catalog maintenance after a Tekla Structures upgrade

Keep the **Applications & components** catalog organized and usable.

1. To be able to edit the **Applications & components** catalog definition files that are located in the `XS_SYSTEM` folders, set `XS_COMPONENT_CATALOG_ALLOW_SYSTEM_EDIT` to `TRUE`.
2. Check the **Ungrouped items** group and add the items to the appropriate group.
3. Check the logs for errors.

The **Applications & components** catalog shows the message log button in the lower-right corner of the catalog if there are errors or warnings, such as errors in the catalog definition files.

4. If there are references to missing plug-ins, go to the referred `ComponentCatalog.xml` and remove the references manually.



```

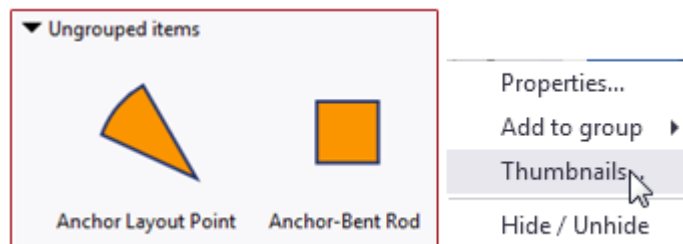
</ComponentCatalogItemPlaceholder>
<ItemIdString>CatalogMacroModelingItem?CreateSurfaceView?GLOBAL</ItemIdString>
</ComponentCatalogItemPlaceholder>
<ComponentCatalogItemPlaceholder>
<ItemIdString>CatalogPluginComponentItem?CopyModelDirectoryPlugin</ItemIdString>
</ComponentCatalogItemPlaceholder>
<ComponentCatalogItemPlaceholder>
<ItemIdString>CatalogMacroModelingItem?CloseViewsExceptSelected?GLOBAL</ItemIdString>
</ComponentCatalogItemPlaceholder>
<ComponentCatalogItemPlaceholder>
<ItemIdString>CatalogMacroModelingItem?CloseTemporaryViews?GLOBAL</ItemIdString>

```

Delete selected lines for each missing plugin

In this example, there might be errors for:

- CatalogPluginComponentItem?CopyModelDirectoryPlugin
 - CatalogPluginComponentItem?SaveAsModelTemplatePlugin
5. Thoroughly test that these changes do not create any further errors or change the structure of your **Applications & components** catalog.
Check at least the **Ungrouped items** and **Legacy catalog** groups.
 6. Hide all non-related applications and components from roles.
 - a. In the **Ungrouped items** catalog, select **Show hidden items** at the bottom.
 - b. Right-click an application or a component and select **Hide / Unhide**.
 7. Create custom thumbnails.



8. Publish components in the **Applications & components** catalog.
You might need to use the same component with different settings in different cases. To easily use the component, you can define the settings for each case and publish the component in the catalog. This feature can be useful for some roles.

Update your customized ribbon for the new Tekla Structures version

If you have customized the ribbon, the changes made in the new Tekla Structures version are not visible. Check the changes and add them to your customized ribbon.

For feature-specific instructions for how to apply additional customizations related to new features, see these feature pages in the [release notes](#).

1. Check the changes in the ribbon to see what has been added and removed, and what has been moved to different tabs.
2. Add changes to your customized ribbon.

For details about how to add feature-specific changes to your customized ribbon, see the Release notes.

2.8 Install and manage .tsep extensions

Tekla Structures extension packages (.tsep packages) are Tekla Structures extensions that you can import to the **Applications & components** catalog. You can also copy .tsep extensions to new versions of Tekla Structures, and uninstall imported extensions that are no longer needed.

Tekla Structures extensions are not part of the Tekla Structures product release. You can download .tsep packages from Tekla Warehouse. For more information, see [Download and install content from Tekla Warehouse](#)

You can install .tsep extensions in these ways:

- Using the **Tekla Structures extension manager** in the **Applications & components** catalog
- Directly from the file system
- Automatically for each user from a shared folder
- Centrally for all users

You can remove .tsep installed extensions in these ways:

- Using the **Tekla Structures extension manager**
- Using the Tekla Structures Extension Package (TSEP) builder and test runner
- Centrally for all users

Import .tsep extensions using Tekla Structures extension manager in the Applications & components catalog

Before you begin, download the .tsep extension from Tekla Warehouse. For more information, see [Download content from Tekla Warehouse](#).

1. Click the **Applications & components** button  in the side pane to open the **Applications & components** catalog.
2. Click  > **Manage extensions** --> **Extension manager**.
3. In the **Tekla Structures extension manager** dialog, click **Import**.
4. Browse to the location where you saved the .tsep extension, then double-click the .tsep extension.

Tekla Structures opens a dialog that lists the installed Tekla Structures versions that are compatible with the extension. If none of the installed Tekla Structures versions are compatible, the compatible versions are listed.

5. Select the Tekla Structures versions into which you want to import the extension.
6. Click **Import**.

The extension is shown in the **Tekla Structures extension manager** in all the Tekla Structures versions that you selected.

7. Restart Tekla Structures to install the imported extension.

The extension is shown in the **Ungrouped items** group in the **Applications & components** catalog. You can move the extension to another existing group, or create a new group.

TIP In **Tekla Structures 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.

Install .tsep extensions directly from the file system

Before you begin, download the .tsep extensions from Tekla Warehouse. For more information, see [Download content from Tekla Warehouse](#). You can also run some .tsep installers directly from Tekla Warehouse using the **Insert into model** option. For more information, see [Insert Tekla Warehouse content into a Tekla Structures model](#).

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

If the .tsep installer does not automatically open with **Tekla Structures extension manager**, right-click the .tsep installer, then

select **Properties**. In **Opens with**, click **Change**, then browse to `TsepFileDispatcherLauncher`.

The **Tekla Structures extension manager** dialog opens and shows the name of the extension that will be installed.

2. Select the Tekla Structures versions into which you want to import the extension.
3. Click **Import**.

The extension is shown in the **Tekla Structures extension manager** in all the Tekla Structures versions that you selected.

4. Restart Tekla Structures to install the imported extension.

The extension is shown in the **Ungrouped items** group in the **Applications & components** catalog. You can move the extension to another existing group, or create a new group.

TIP In **Tekla Structures 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.

Install .tsep extensions automatically from a shared folder

By default, extensions are automatically installed from the `\ProgramData\Trimble\Tekla Structures\<version>\Extensions\To be installed` folder on each user's computer. You can use the `XS_TSEP_TO_BE_INSTALLED_ORG_DIR` advanced option to automatically install .tsep extensions from a shared folder instead.

The `XS_TSEP_TO_BE_INSTALLED_ORG_DIR` advanced option specifies the location of the folder from which .tsep extensions are automatically installed. When you set this advanced option in the `user.ini` file for each user, any .tsep packages in the shared folder are automatically installed when users restart Tekla Structures.

1. Create a folder in a shared location, such as under the [firm folder \(page 17\)](#).
2. Copy one or more .tsep packages to the shared folder.

3. Set the value of the `XS_TSEP_TO_BE_INSTALLED_ORG_DIR` advanced option to the location of the shared folder in the `user.ini` file for each user.

You can also instruct users how to set the value of this advanced option in their own `user.ini` files.

The extensions are installed when users restart Tekla Structures. Different extensions might be installed for different users at different times.

Install .tsep extensions centrally

By default, extensions are automatically installed from the `\ProgramData\Trimble\Tekla Structures\<version>\Extensions\To be installed` folder on each user's computer. You can centrally install a batch of .tsep extensions on all company workstations using the `%XSDATADIR%\Extensions\To be installed` folder.

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`.
1. If the `%XSDATADIR%\Extensions\To be installed` folder does not yet exist, create it.
 2. Copy the .tsep installers to the `%XSDATADIR%\Extensions\To be installed` folder.

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, this command copies all .tsep installers from the `\Server1` network directory to the local user's `\To be installed` folder. in Tekla Structures 2026.

After copying, `TepAutoInstaller.exe` installs all .tsep installers from the local user's `\To be installed` folder. Installing the packages in this

way allows users to start Tekla Structures without first waiting for the installations to complete.

```
robocopy
"\\Server1\prod\TeklaStructures\2026.0\Environments_TSEP"
"C:\ProgramData\Trimble\Tekla Structures\2026.0\Extensions\To be
installed"
*.tsep
"C:\Program Files\Tekla
Structures\2026.0\bin\TeklaExtensionPackage.TepAutoInstaller.exe"
2026.0 "C:\ProgramData\Trimble\Tekla Structures\2026.0" "2026"
```

Update installed extensions

When updates for your installed extensions are available, you can download and install the updated .tsep packages in the same way as you install other .tsep packages.

To receive notifications when new versions of extensions are available, [Subscribe to alerts about content updates in Tekla Warehouse](#).

If there is an older version of the same extension package, it is automatically uninstalled before installing the new version. Installation is canceled if the same or newer version has already been installed.

Copy .tsep extensions to a new Tekla Structures version

When you update to a new Tekla Structures version, you can use the Migration Wizard tool to copy the installed .tsep extensions to the new version.

1. Click the **Applications & components** button  in the side pane to open the **Applications & components** catalog.
2. Click  > **Manage extensions** --> **Migrate extensions** .
3. Restart Tekla Structures to install the copied extensions.

Remove .tsep extensions using Tekla Structures extension manager

You can uninstall the installed extensions in **Tekla Structures extension manager**.

Uninstalling extensions creates a log file in the \Tekla Structures\<version>\Extensions\TSEP Logs folder.

1. Click the **Applications & components** button  in the side pane to open the **Applications & components** catalog.

2. Click  > **Manage extensions** --> **Extension manager**.
3. Select one or more extensions in **Tekla Structures extension manager**.
Use **Ctrl** or **Shift** to select several extensions.
4. Click **Remove**.
5. Restart Tekla Structures to remove the extensions.

Remove .tsep extensions using Tekla Structures Extension Package (TSEP) builder and test runner

1. To open the **Tekla Structures Extension Package (TSEP) builder and test runner** dialog, browse to the `\Program Files\Tekla Structures\<version>\bin` folder, then double-click `TeklaExtensionPackage.Builder.exe`.
2. On the **Uninstall TSEP based extensions** tab, select the .tsep packages that you want to uninstall.
Use **Ctrl** or **Shift** to select more than one .tsep package.
3. Click **Uninstall selected**

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

Remove .tsep extensions centrally

You can uninstall .tsep extensions in batches to remove them from all company workstations.

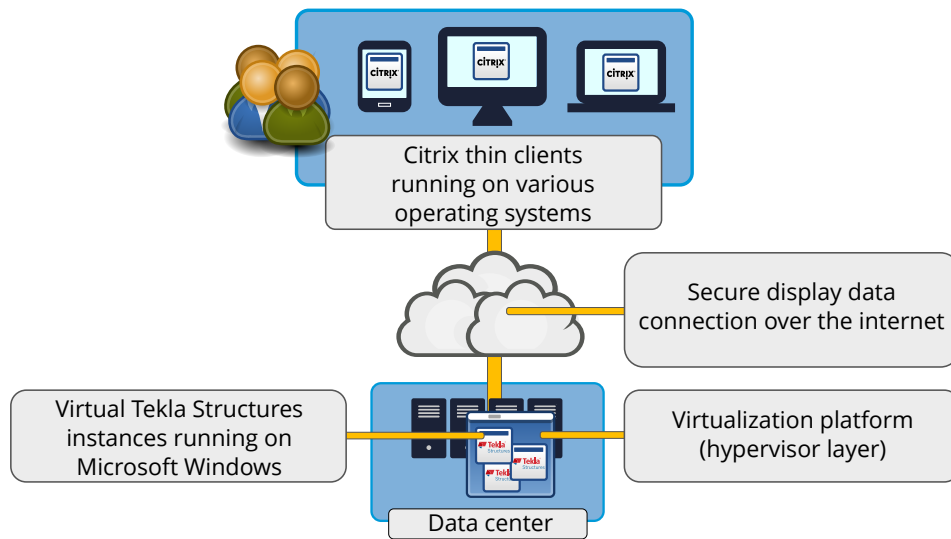
1. Create an empty file named `RemoveExtensionOnStartup`.
2. Copy this file to the folder for each extension that you want to uninstall on all users' computers. For example, `\ProgramData\Trimble\Tekla Structures\<version>\Extensions\Installed\<Extension_To_Be_Uninstalled>`.

The extensions are removed the next time that users start Tekla Structures.

2.9 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.

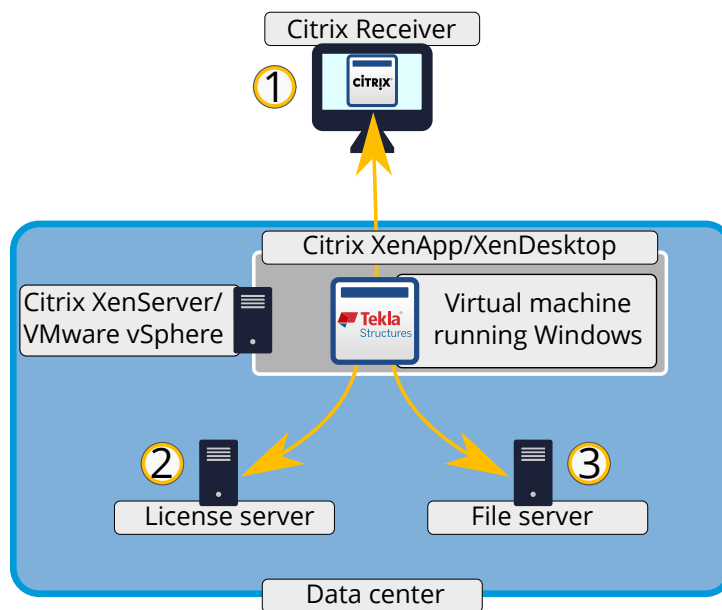
Streaming applications from the server makes it possible to use Tekla Structures on client computers, tablets, and smartphones that have different hardware and software configurations. Tekla Structures runs on Windows on the remote server and the virtualization solution allows client devices to be used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

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. 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.

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, 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.

- Project Settings Management Console (Preview)
- Hierarchy of Tekla Structures settings
- Distribute customized ribbons by using a firm or environment folder
- [Distribute customized tabs by using a firm or environment folder \(page 53\)](#)
- Distribute customized property pane layouts by using a project, firm, or environment folder

- [Distribute customized property pane settings by using a project, firm, or environment folder \(page 56\)](#)
- Distribute customized toolbars by using a project, firm, or environment folder
- [Files for configuring Tekla Structures \(page 57\)](#)
- [Develop applications using Tekla Open API \(page 157\)](#)

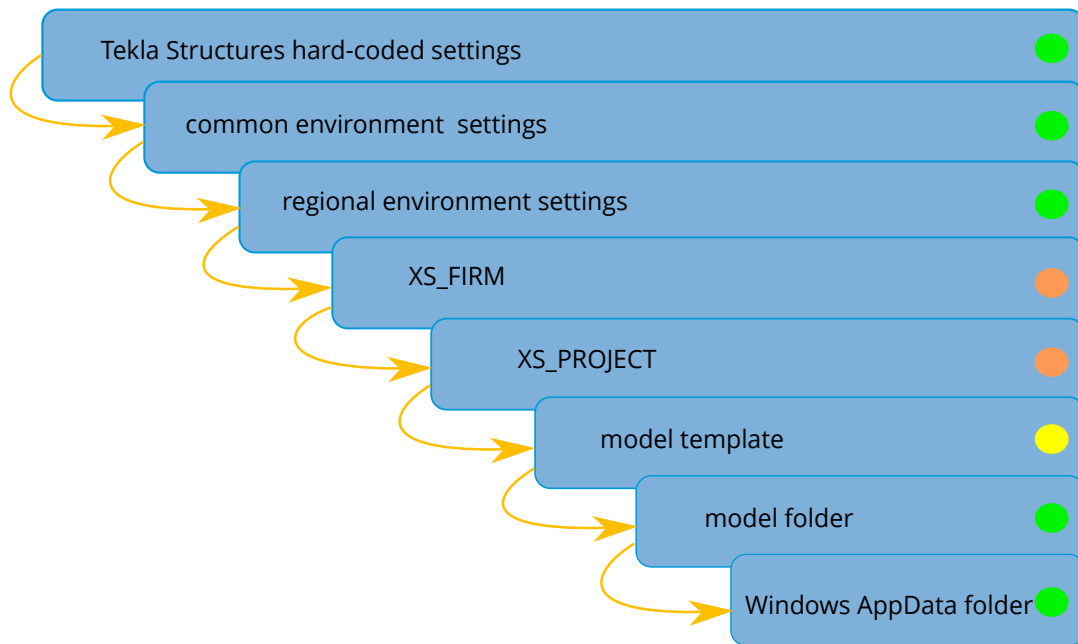
3.1 Project Settings Management Console (Preview)

The Project Settings Management Console is a web-based tool that lets you manage your project settings, environments, and other project files in the cloud. You can create custom cloud-based environments to enhance collaboration and ensure consistent settings for users who open models using Tekla Launcher.

For more information, see the [Project Settings Management Console product guide](#).

3.2 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 \(page 159\)](#).
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 \(page 62\)](#) 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 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 \(page 58\)](#).

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.

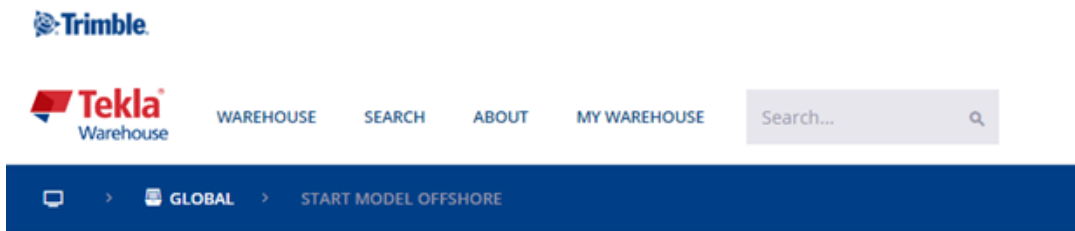
Customization of model templates

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 useful if your company has different kinds of projects, such as, parking garages, office buildings, bridges, and industrial.

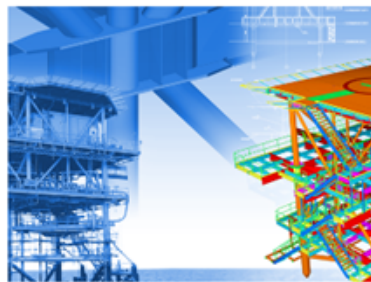
To create a model template, see [Create model templates](#).

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.



Start model offshore



GROUP: Model setup files
CATEGORY: Offshore

Offshore model template contains sample model showing various offshore components applied as an example. User can use this while starting new offshore structure & get acquainted with Tekla offshore specific component library. Saved to your `XS_MODEL_TEMPLATE_DIRECTORY` location.

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](#), Reports, and [Templates \(page 181\)](#).

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](#).

3.3 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

Configuration identifier	Configuration name
albl_up_Rebar_Detailing	Rebar Detailing
albl_up_Steel_Detailing	Steel Detailing
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

3.4 Distribute customized tabs by using a firm or environment folder

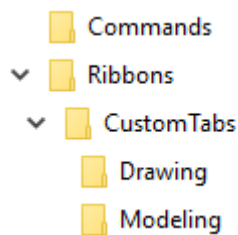
As an alternative to customized ribbon files, which override the existing ribbon, you can distribute customized tabs to other users in the company by placing the tab files in a firm or an environment folder.

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.

3.5 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.

3.6 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.

3.7 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.

3.8 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 \(page 58\)](#)

[Check and change Tekla Structures file and folder locations in Directory browser \(page 61\)](#)

[Initialization files for start-up parameters and default settings \(page 62\)](#)

[Input files \(.inp files\) for configuring Tekla Structures \(page 72\)](#)

[Data files \(.dat files\) for configuring Tekla Structures \(page 89\)](#)

[Customize user interface text in message files \(page 91\)](#)

[Customize object properties and settings in property files \(page 92\)](#)

[Standard files \(page 93\)](#)

[Files related to catalogs \(page 96\)](#)

[Font files for customizing Tekla Structures \(page 98\)](#)

[Symbol files for drawings \(page 99\)](#)

[Files related to templates, reports and drawings \(page 99\)](#)

[Supported image file formats in Tekla Structures \(page 101\)](#)

[Log files about the operation of Tekla Structures \(page 102\)](#)

[Files and file name extensions in the Tekla Structures model folder \(page 110\)](#)

[Files related to options and advanced options \(page 133\)](#)

Folder search order

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

Except for `objects.inp` files, Tekla Structures stops searching when it finds the first associated file. 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. `.tpl` files can also be located in the `\templates` folder under 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 <code>\\Environments\common</code> 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 <code>env_<environment>.ini</code> 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: <pre>set XS_SYSTEM=%XS_STEEL%;%XS_ENGINEERING%;%XS_CONTRACTOR%;%XS_GENERAL%;%XS_DATADIR%\environments\common\system\</pre>

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 393), material, and rebar (page 408) catalogs: 1. Model folder 2. Project folder (XS_PROJECT) 3. Firm folder (XS_FIRM) 4. Folder defined by the advanced option Shape catalog (page 372): 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 89)	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 () The user-defined attributes in all <code>objects.inp</code> files are merged, and duplicate attributes are removed. If Tekla Structures encounters the same attribute name in different <code>objects.inp</code> files, the attribute from the first read <code>objects.inp</code> file is used. For more information, see Search order of objects.inp files (page 166).
privileges.inp	1. Model folder 2. Project folder (XS_PROJECT)

File or file type	Search order
	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 181) (.tpl files)	1. Folder that contains your templates defined by the advanced option 2. Model folder or \templates folder under the model folder (graphical template files) 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 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

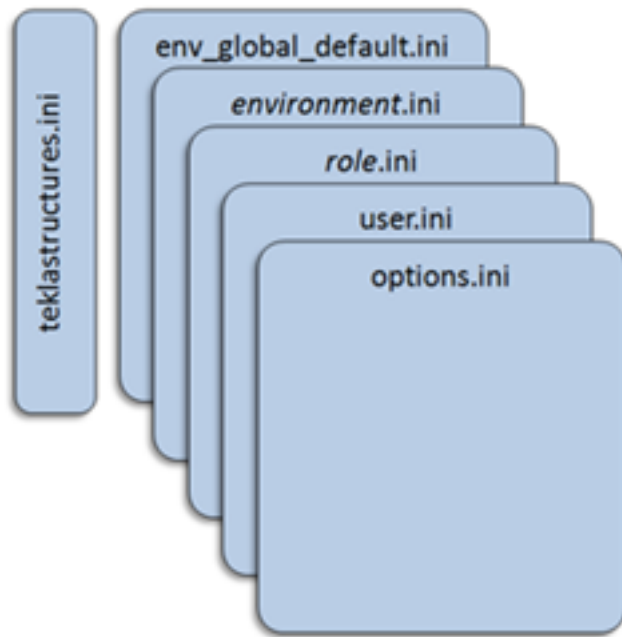
[Create customized desktop shortcuts for Tekla Structures \(page 430\)](#)

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	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 <code>fonts_jpn.ini</code> file is the fonts file for the Japanese language. These files are automatically installed in the <code>\bin</code> folder when Tekla Structures is installed. The default location is <code>..\Program Files\Tekla Structures\<version>\bin\</code>.
2	teklastructures.ini	Do not change these settings. This file contains basic system settings, such as the location of software and environment files, that are needed for Tekla Structures to run.

Order	File	Description
		This file is read when Tekla Structures starts up. This file is automatically installed in the \bin folder when Tekla Structures is installed. The default location is ..\Program Files\Tekla Structures\<version>\bin
3	lang_<lang>.ini	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 during the software installation determine which lang_<lang>.ini files are available. This file is automatically installed in the \bin folder when Tekla Structures is installed. The default location is ..\Program Files\Tekla Structures\<version>\bin\.
4	env_global_defaults.ini	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 startup shortcut (page 430) or on the command line with the case-	Usually none.

Order	File	Description
	sensitive parameter -I <name>.ini	
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 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. 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.

Order	File	Description
		Example for the steel role: <pre>set XS_STEEL=%XSDATADIR% \environments\Steel\master_drawin gs\;%XSDATADIR% \environments\Steel\model_filters \;%XSDATADIR% \environments\Steel\model_setting s\</pre> For example, <code>XS_GENERAL</code> points to the <code>\General</code> folder that has content common for all roles and settings. When defining role settings in <code>XS_SYSTEM</code>, you use the role options defined in the <code>env_<environment>.ini</code> to point to the role-specific settings. You do not need to add the folder paths in <code>XS_SYSTEM</code>. They are defined in the <code>env_<environment>.ini</code> file.
7	<code>role_<role>.ini</code>	Do not change these settings. These files contain advanced options that have typical role-specific settings. The <code>role_<role>.ini</code> 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 <code>..\ProgramData\Trimble\Tekla Structures\<version>\Environments\<environment></code>. Which <code>role_<role>.ini</code> files are installed on your computer depends on which environment packages you have installed. For example, the <code>role_Engineer.ini</code> file in the <code>\Environments\uk</code> folder contains all the settings for the Engineering role in the UK environment.
8	Any <code>.ini</code> files defined in the startup shortcut (page 430) or on the command line with the case-	Usually none.

Order	File	Description
	sensitive parameter -i <name>.ini	
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 <code>user.ini</code> 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, the settings are saved in the <code>user.ini</code> file. The default location for this file is C:\Users\<user_name>\AppData\Local\Trimble\Tekla Structures\<version>\UserSettings. Advanced options that are set in the <code>user.ini</code> file override advanced options that are set in other <code>.ini</code> files. For example, if the same advanced option is set in another <code>.ini</code> file, in a file in the environments sub-folder, and in the <code>user.ini</code> file, Tekla Structures uses the value in the <code>user.ini</code> file.
11	options.ini in the system folder	This file contains the system settings. The <code>options.ini</code> 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 <code>options.ini</code> 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 . To use these files, you must
13	options.ini in the project folder	

Order	File	Description
		copy or move an <code>options.ini</code> file to these locations. You can only update model-specific and user-specific advanced options from the Advanced Options dialog or the <code>options.ini</code> file in model folder. You cannot use <code>options.ini</code> files in the firm or project folder to update model-specific or user-specific advanced options. The <code>options.ini</code> in the firm or project folder is read when you start Tekla Structures or open the model.
14	<code>options.ini</code> in the model folder	This file contains the model-specific settings. The <code>options.ini</code> file in the model folder is read when you open the model. Note: Changing a model-specific advanced option value in an <code>.ini</code> file located outside the model folder does not affect existing models.

See also

[Settings defined by advanced options \(page 155\)](#)

Global default environment settings - `env_global_default.ini`

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

The location of the `env_global_default.ini` file depends on the folder where you installed Tekla Structures.

Tekla Structures installation folder	Location of <code>env_global_default.ini</code>
<code>\Program Files\Tekla Structures\<version>\</code>	<code>..\ProgramData\Trimble\Tekla Structures\<version>\environments\common\</code>
A folder that you selected	<code><installation folder>\<version>\environments\common\</code>

WARNING Do not modify the `env_global_default.ini` file.

To modify environment settings, copy the advanced options that you want to modify from the `env_global_default.ini` file to your [user.ini \(page 70\)](#) file. Then, modify the settings in your [user.ini \(page 70\)](#) file. You can also modify some settings in the **Advanced Options** dialog.

For advanced options that are set according to your local standards, see the environment settings file [env_<environment name>.ini \(page 69\)](#) and the role settings file [role_<role name>.ini \(page 69\)](#). The local files override the advanced options set in `env_global_default.ini`.

If an advanced option in the `env_global_default.ini` file is preceded by `rem`, the software defaults are used and are 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 that are different from the global defaults.

WARNING Do not edit the `env_<environment>.ini` file. If you need to change some settings, copy the advanced options from the `env_<environment>.ini` file to your [user.ini \(page 70\)](#) file and change the settings there. You can also change the settings in the **Advanced Options** dialog.

The file is read from the `<installation folder>\Environments\` folder.

The file location can vary depending on the folder structure of your environment files. For example, if you install Tekla Structures in the `\Program Files\Tekla Structures\<version>` folder, the file is located in the `..\ProgramData\Trimble\Tekla Structures\<version>\Environments\` folder.

The global default environment settings file [env_global_default.ini \(page 68\)](#) 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 70) file and modify the settings there, or modify the settings in the **Advanced Options** dialog.

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 69). The global default environment settings file `env_global_default.ini` (page 68) 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 69), 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 52) of the ribbon files, 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 \(page 155\)](#) advanced options to the `user.ini` file.

You can also add [model-specific \(page 155\)](#) 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 XSDATADIR=C:\ProgramData\Trimble\Tekla Structures\2024
```

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

Possible values	Example
switches	<pre>set XS_ASSEMBLY_FAMILY_POSITION_NUMBER_FORMAT_STRING=%%TPL:PROJECT.NUMBER%%</pre> Use two switches. NOTE: If you are defining the switch in an .ini file, use double percent signs %%xxx%% around the switch.

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 \(page 62\)](#)

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 dialogs, 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.
floorlayout.cutouts.inp	Contains definitions for custom UDAs for cutouts created by the Floor layout tool.
fltprops.inp	Includes materials and dimensions of available flat bars (page 73) .
mesh_database.inp	Contains definitions for reinforcement meshes.
objects.inp	Used to manage user-defined attributes.
objects_BuildingHierarchyAttributes.inp	Contains definitions for building hierarchy.
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 319) .
rebar_config.inp	Contains settings for reinforcement marks.
rebar_database.inp	Rebar catalog (page 408) . Contains definitions for reinforcing bars and strands.

File	Description
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 objects.inp files \(page 173\)](#)

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 \(page 339\)](#) file as a parametric profile.

3. Set other advanced options related to plate work in the **Advanced options** dialog 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 \(page 73\)](#) 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
8x60, 8x65, 10x70, 10x75	S235
10x100, 10x110, 15x200, 15x220	S275J0

Set advanced options related to plate work in the **Advanced options** dialog 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 in the `unfold_corner_ratios.inp` file define the location of the neutral axis when a profile is unfolded. The neutral axis is a line that 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 show unfolded profiles in single-part drawings.

Correct unfolding of parts ensures that single part drawings and NC data have the correct adjusted lengths for opening them out into flat shapes. When the part is formed into its real shape it will create the correct overall length of the part. The adjusted length depends on the thickness of material type of profile and radius of bends among other factors.

Notes and limitations

- Check for parts with zero weight using reports or filters. Those parts can not be unfolded.
- Check session logs for problematic solids as those parts can not be unfolded. You can also use solid error detection extensions available in Tekla Warehouse, for example, [Solid error detector](#).
- 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.

Modify unfolding parameters

1. Open the `unfold_corner_ratios.inp` file in a standard text editor.
This file is usually located in your environment folder. If this file does not exist in your environment folder, modify the `unfold_corner_ratios.inp` file located in the `..\Tekla Structures\<version>\environments\common\system` folder.
2. Modify the unfolding parameters and save the file.

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 \(page 58\)](#).

Within the `unfold_corner_ratios.inp` file you can configure how parts are unfolded. There are 2 types of unfolding rules you can configure, once set this will control the lengths of the unfolded parts and the NC data.

Type 1: You can control how parts are unfolded by the part rotation and angle (splay) of bend.

Type 2: You can control how parts are unfolded by part thickness (or if profile, its width) and radius of the bends.

Type 2 is the more typical method to use to unfold parts. A combination of both these options can be configured to allow the user to set up finite specialized unfolding rules to their company standards.

For more information about defining the parameters and for some examples, see the "Unfolding parameters" table below.

3. Restart Tekla Structures for the changes to take effect.

Unfolding parameters

Below is an example of the `unfold_corner_ratios.inp` file:

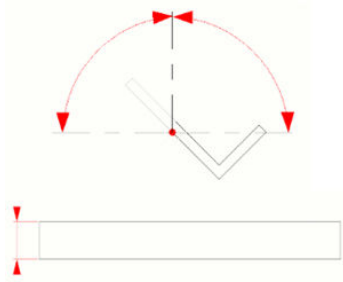
```
# Example unfolding corner ratio configuration file
# Lines beginning with '#' are comments
#
#
# [type = 1] [profile] [material] [rotation min] [rotation max] [flag: 1
= sharp, 2 = curved] [angle/radius min] [angle/radius max] [ratio]
#
1 HE* S235JR -180 180 1 0 90 .7
1 HE* S235JR -180 180 2 0 1000 .7
#
# PLATE
#
# [type = 2] [profile] [material] [thickness min] [thickness max] [flag:
1 = sharp, 2 = curved] [angle/radius min] [angle/radius max] [ratio]
#
2 PL* S235JR 0 200 1 -180 180 .6
2 PL* S235JR 0 200 2 0 1000 .6
```

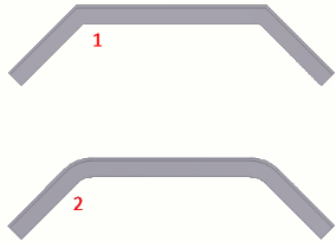
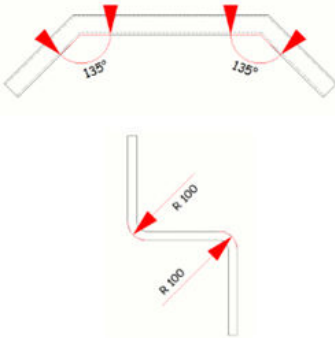
Below is a list of the unfolding parameters in the `unfold_corner_ratios.inp` file and the descriptions of the parameters. Examples in the table are taken from the following definition:

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

Parameter	In the example	Description
Type	1	This parameter specifies the part type. Selecting the type allows you to

Parameter	In the example	Description
		define different rules for different profiles. To control how parts are unfolded by the part rotation and angle (splay) of bend, use type 1. This method is for polybeams. To control how parts are unfolded by thickness (or if profile its width) and radius of the bends, use type 2. This method is for plates modeled as polybeams (for example, PLT). Type 3 means that parts will be ignored and not unfolded. This is for parts that follow the old polybeam calculation (for example, the line 3 L* * disables unfolding of L profiles). See examples after the table.
Profile	HE300A	This parameter specifies the profile name. You can also use wildcards (*) in the profile name, for example, HE300*. * by itself means any profile.
Material	S235JR	This parameter specifies the material name. You can also use wildcards (*) in the material name, for example, S235*. * by itself means any material.
Rotation min Thickness min	0	For polybeams , this parameter specifies the minimum angle when the profile is rotated

Parameter	In the example	Description
		around its longitudinal axis. For plates, this parameter specifies the minimum thickness of the plate. 
Rotation max Thickness max	180	For polybeams, this parameter specifies the maximum angle when the profile is rotated around its longitudinal axis. For plates, this parameter specifies the maximum thickness of the plate.
Flag	2	This parameter specifies if the part has sharp folds or curved bends. This parameter defines what kind of parts are affected by the parameters Angle min/Radius min and Angle max/Radius max. Value 1 means that the part has sharp folds. Only polybeams with straight chamfers are affected. Value 2 means that the part has curved bends. Only polybeams with curved chamfers are affected.

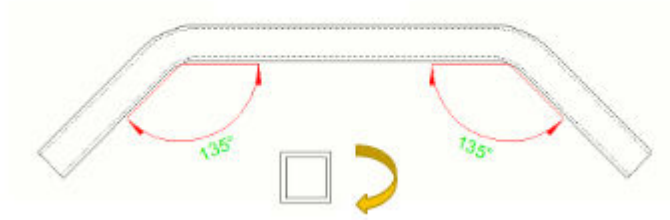
Parameter	In the example	Description
		
Angle min Radius min	0	This parameter specifies the minimum angle for sharp folds. This parameter specifies the minimum radius for curved bends. 
Angle max Radius max	1000	This parameter specifies the maximum angle for sharp folds. This parameter specifies the maximum radius for curved bends. 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	This parameter specifies how the polybeam will get unfolded, which in

Parameter	In the example	Description
		turn determines what its length will be. Specifically, it determines at which depth (perpendicular to the plane of bending/turning), Tekla Structures unfolds the beam. Ratio = (1 - the relative location of the neutral axis). Options: 1 = outside of part: the polybeam will be unfolded along its outer surface 0 = inside of part: the polybeam will be unfolded along its inner surface (Height = 0) 0.5 = Mid line of part: the polybeam will be unfolded around its center line 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 indicated by the minimum and maximum values. See examples below.

Examples of different parameter settings

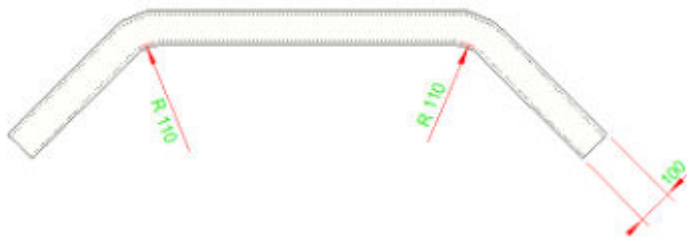
Type = 1

1 L* * -180 180 1 0 200000 1



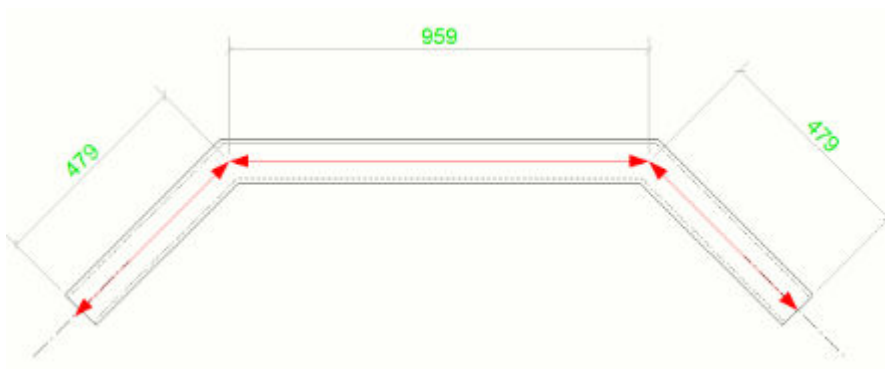
Type = 2

2 L* * 0 2000 1 0 200000 1



Ratio = .5

The part is unfolded around its center line.



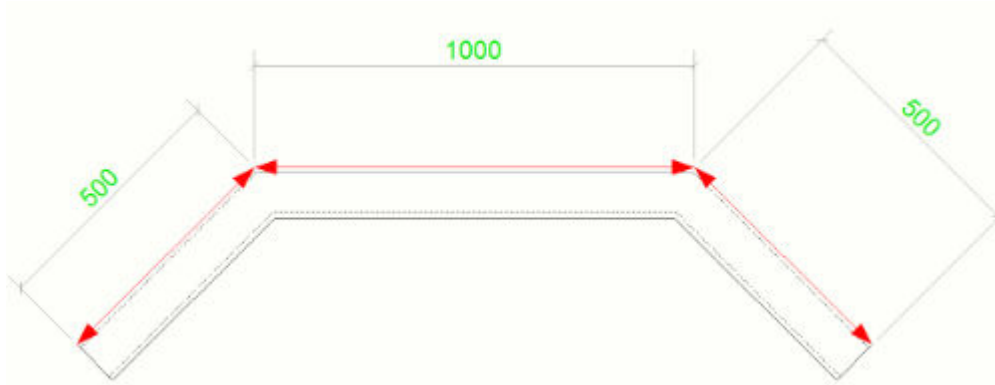
Ratio = 0

The part is unfolded around the inside edge.



Ratio = 1

The part is unfolded around the outside edge.

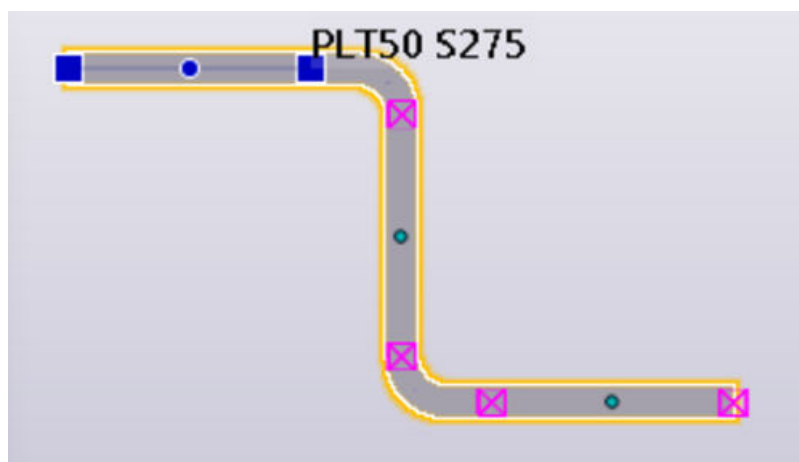
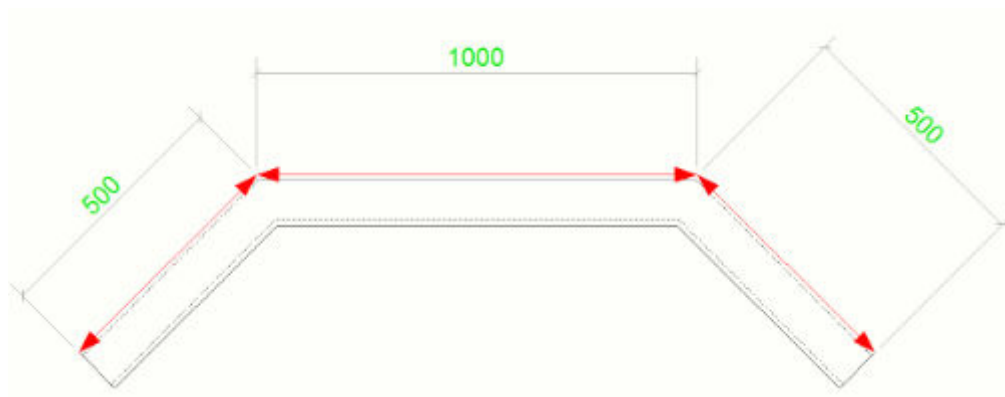
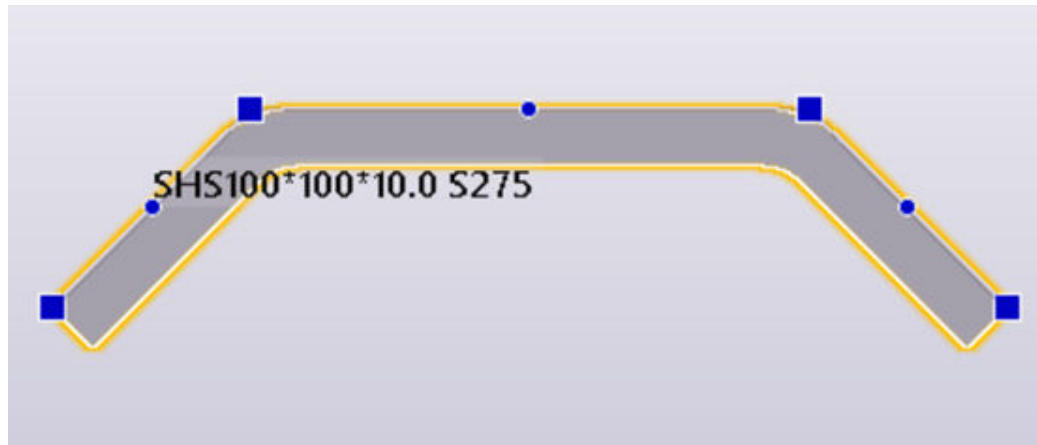


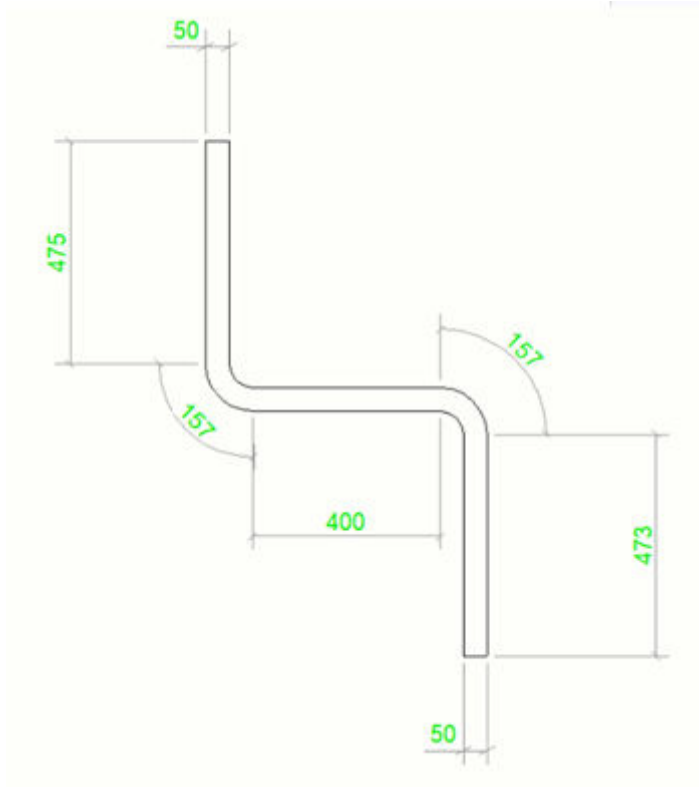
Examples of typical definitions in `unfold_corner_ratios.inp`

- To unfold all parts around the outside face just based on the width of the part and the radius of the corners, you can simplify the `unfold_corner_ratios.inp` definitions by adding the following lines:

```
2 * * 0 2000 1 0 200000 1
2 * * 0 2000 2 0 200000 1
```

Regardless of profile type and material, all profiles will be unfolded around the outside edge.



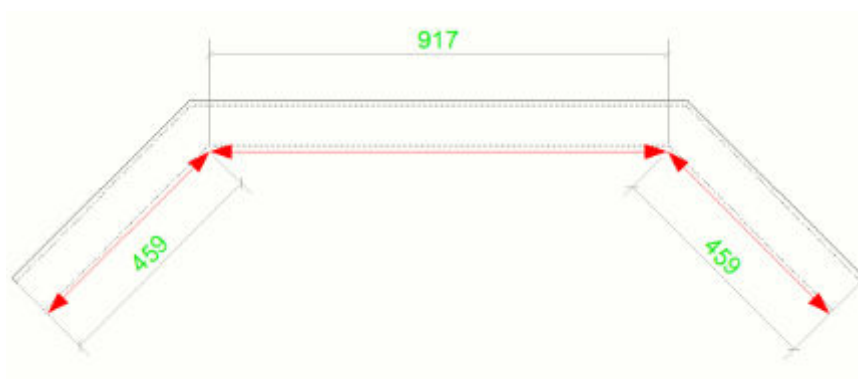


- To unfold all parts around the inside face just based on the width of the part and the radius of the corners, you can simplify the `unfold_corner_ratios.inp` definitions by adding the following lines:

```
2 * * 0 2000 1 0 200000 0
```

```
2 * * 0 2000 2 0 200000 0
```

Regardless of profile type and material, all profiles will be unfolded around the inside edge:



- To unfold the SHS and PLT profiles round their outside (longest faces), add the following lines in the `unfold_corner_ratios.inp`:

```
1 SHS* S* -180 180 1 0 200000 1
```

```

1 SHS* S* -180 180 2 0 200000 1
2 P* S* 0 200 2 0 200000 1
2 P* S* 0 200 1 0 200000 1

```

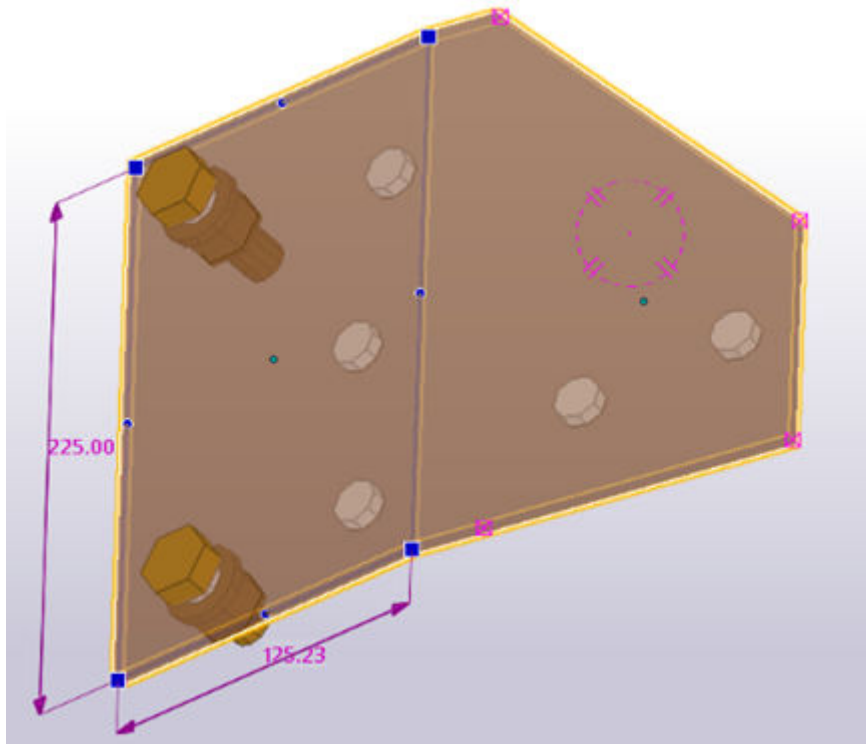
- To unfold this PLT (created using two plates and joining them with the **Bent plate** command) around its outside face, add the following lines in the `unfold_corner_ratios.inp`:

```

2 P* * 0 500 1 0 200000 1
2 P* * 0 500 2 0 200000 1

```

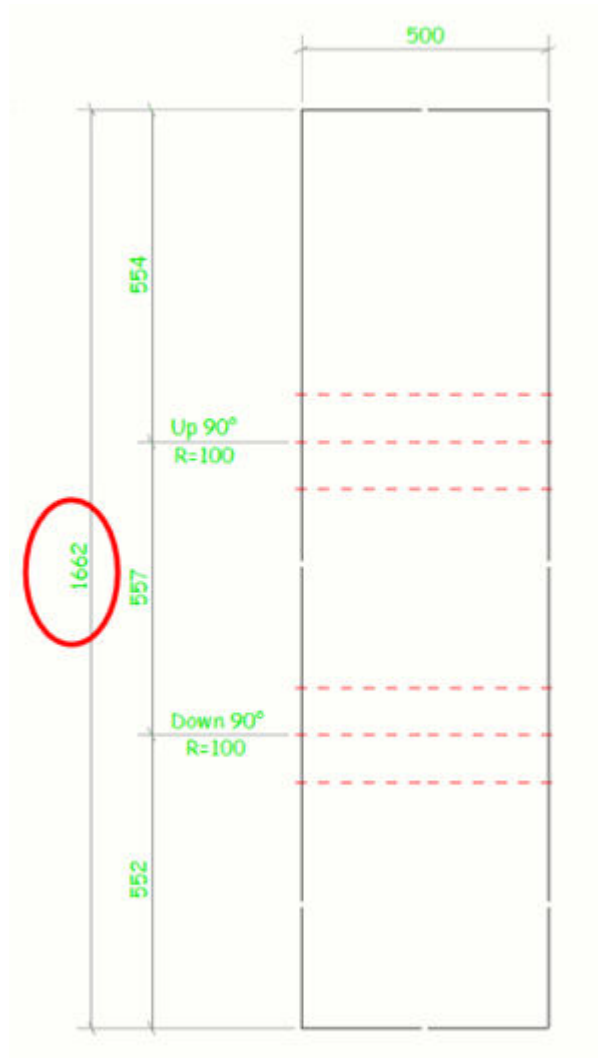
Plates are unfolded around the outside face including CNC data.




```

2 P* * 0 200 1 0 20000 1
2 P* * 0 200 2 0 20000 1
#

```

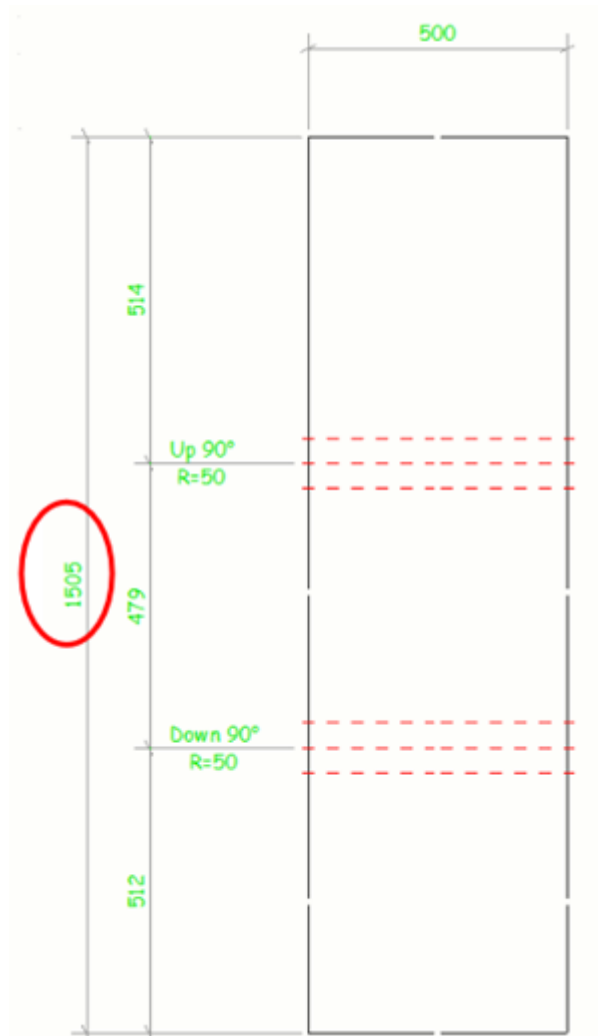


- To unfold the plate around its inside (shortest) sides, add the following lines in `unfold_corner_ratios.inp`:

```

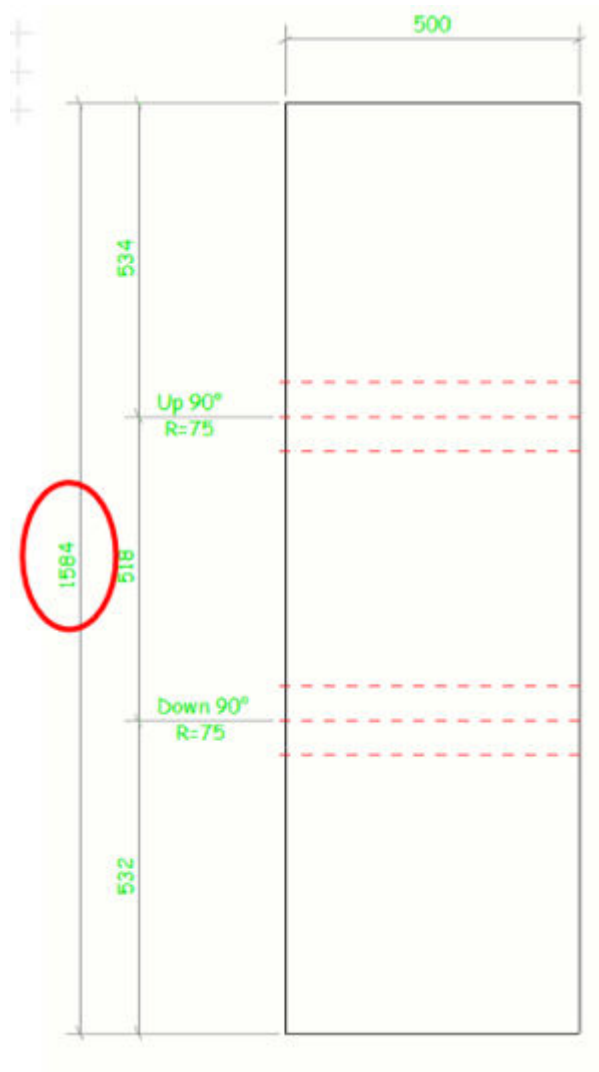
#
2 P* * 0 200 1 0 20000 0
2 P* * 0 200 2 0 20000 0
#

```



- To unfold the plate around its center line, add the following lines in `unfold_corner_ratios.inp`:

```
#
2 P* * 0 200 1 0 20000 .5
2 P* * 0 200 2 0 20000 .5
#
```

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
gauge_lines.dat	Contains data for gage lines that define the location of bolts on a brace. Use gage lines to: - Specify distances between bolts, horizontally and vertically - Specify distances from the center of bolts to the edge of braces - Adjust the position of individual bolts - Remove bolts The following components use the gauge_lines.dat file: Tower 1 diagonal (87) Tower 2 diagonal (89) Leg 1 diagonal (178) Bolted gusset brace (167) Bolted brace (181) Bolted plate brace (182) Batten plates (S85) Windbrace connection (110) Bent gusset (140) L splice (175) Parallel L profiles (176)
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.

File	Description
marketsize.dat	Contains available market sizes for certain material grade. Can be used with <code>fMarketSize()</code> 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 dialogs.

Customize message files

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

NOTE Do not directly edit the default message files.

- Browse to the message file that contains the text that you want to customize.
 - 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`.
- Make your own copy of the file and save it in a location that does not get overwritten during upgrades, such as in the [firm folder \(page 17\)](#).
- Update the value of the `XS_MESSAGES_PATH` advanced option to use the location of your customized file.
- Open the message file using a text editor, such as Microsoft Notepad.
- Modify the messages as required.

If you duplicate the default strings in your custom files, add a custom message group prefix to the default strings to make them unique.

6. 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>\bin\messages` folder.
2. Make a copy of the `by_number.ail` file and save it in the firm folder.
The `by_number.ail` file contains both prompts and default texts that Tekla Structures uses in drawings.
3. Update the value of the `XS_MESSAGES_PATH` advanced option to use the location of your customized file.
4. Open your copy of the `by_number.ail` using a text editor.
5. Browse to the following section:

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

6. Change (N/S) to (NS) in the entry row.
7. 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 dialogs 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

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.

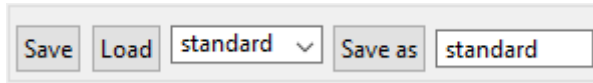
How properties are loaded from standard files

- 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 dialogs, 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

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

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

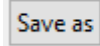
Create user-defined standard files

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 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: in the box next to the **Save as** button, enter `standard` as

the name  `standard`
, 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.

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	..\ProgramData\Trimble\Tekla Structures\<version>\Environments\<environment>\profil

File type	File name	Used for	Default location
		S235JR to FE360B for DSTV.	
	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>\Environments\common\inp
.lis	Many possible file names. You can define the file name while exporting.	Created when you export bolt, profile, and material catalogs.	Many possible folders. 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
.xml	Many possible file names	Attributes of shapes in the shape catalog, such as the name and GUID.	<model_folder>\Shapes
.teзор.xml	Many possible file names	Geometric properties of shapes in the	<model_folder>\ShapeGeometries

File type	File name	Used for	Default location
		shape catalog, such as coordinates.	

See also

[Customize the material catalog \(page 285\)](#)

[Customize the original profile catalog \(page 307\)](#)

[Customize the shape catalog \(page 372\)](#)

[Customize the bolt catalog \(page 393\)](#)

[Customize the rebar catalog \(page 408\)](#)

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 `<installation folder>\Environments\common\fonts` folder.

If you install Tekla Structures in the `\Program Files\Tekla Structures\<version>\` folder, the fonts are located in the `..\ProgramData\Trimble\Tekla Structures\<version>\Environments\common\fonts` folder.

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 `<installation folder>Environments\common\fonts` folder.

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

File	Used for
<code>template_fonts.cnv</code>	Converting Tekla Structures system fonts, such as Template Editor fonts, to Windows fonts in DWG/DXF export.

File	Used for
<code>dxfontfonts.cnv</code>	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 \(page 62\)](#)

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
<code>.rpt</code>	Report templates (page 181) created with the Template Editor	System folders defined for the advanced option <code>XS_SYSTEM</code>
<code>.tpl</code>	Drawing templates (page 181) created with the Template Editor	Template folders defined for the advanced option <code>XS_TEMPLATE_DIRECTORY</code>
<code>.lay</code>	Layout definitions created with the Drawings & reports --> Drawing properties --> Drawing layout editor command.	The <code>\attributes</code> sub-folder in the model folder
<code>plotdev.bin</code>	Printer device definitions created with the Printer Catalog printer instances.	System folders defined with the advanced option <code>XS_SYSTEM</code>
<code>xdproc</code>	Master Drawing Catalog rule set	System folders defined with the advanced option <code>XS_SYSTEM</code>

File or file type	Description	Location
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 \(page 58\)](#).

The default report (.rpt), and template (.tpl) files are read from the system folders defined with the XS_SYSTEM advanced option or from the XS_TEMPLATE_DIRECTORY folders. The user-defined .rpt files must be located at the root level of the model folder and the user-defined .tpl files at the root level of the model folder or in the \templates folder under 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>
```

```
</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.
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 dialogs and thumbnails
- Drawing line types
- The surface treatment dialog
- The **Master Drawing Catalog** for thumbnails and sample images
- Profile properties dialogs

These image file formats are supported in Tekla Structures:

Used in	Supported image formats
Templates	• bmp • gif • grd • jpg • ppm • pgm • rle • tiff • xkrl
Drawing snapshots	png
Thumbnail and sample images for the Master Drawing Catalog	png
Other uses	bmp

See also

[Add images in a template \(page 227\)](#)

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 \logs folder under the current model folder.

File	Description
BCFTopics-<process ID>.log	Contains information about Trimble Connect BCF Topics. This log file is saved in the %LocalAppdata%\Trimble\Tekla Structures\%Version%\Logs folder.
check_database.log	Tekla Structures stores information in this file when you run the Repair model command in File --> Diagnose & repair --> Model. This log file is saved in the \logs folder under the current model folder.
ClashCheck.log	Contains clashes found in the most recent clash check. This log file is saved in the \logs folder under the current model folder.
conflict.log	Contains conflicts that have occurred when more than one user has modified an object in multi-user mode. This log file is saved in the \logs folder under 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.
DPMPrinter_<PrintJob-ID>.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 to a PDF file. This log file is saved in the %LocalAppdata%\Trimble\Tekla Structures\%Version%\Logs folder.
drawing_cloning.log	Contains information about cloned drawings. This log file is saved in the \logs folder under the current model folder.
drawing_history.log	Contains information about drawing history. Use the advanced option XS_DRAWING_HISTORY_LOG_TYPE to define the contents of the file. This log file is saved in the \logs folder under the current model folder.

File	Description
dstv_nc.log	Each time you create NC files, Tekla Structures stores information in this file about the processed assemblies. 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 \logs folder under the current model folder.
LiveCollaboration-<process ID>.log	Contains information about Live Collaboration. This log file is saved in the %LocalAppdata%\Trimble\Tekla Structures\%Version%\Logs folder.
modelsharing_<process ID>.log	Contains the sharing operations that have been performed in Tekla Model Sharing when the model is open. For example, opening a shared model and reading in the changes made by other users are stored in the modelsharing_<process ID>.log file. This log file is saved in the \logs folder under the current model folder.
numberinghistory.log	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 \logs folder under 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 \logs folder under the current model folder.

File	Description
TeklaStructures_LicenseAndLoginEvents_<process ID>.log	Contains events related to license and login activities. This log file is saved in the %LocalAppdata%\Trimble\TeklaStructures\%Version%\Logs folder.
TeklaStructures-<process ID>.log	Contains information about the entire Tekla Structures session from opening the model to closing it. This log file is saved in the %LocalAppdata%\Trimble\TeklaStructures\%Version%\Logs folder. The log entries for the last five Tekla Structures sessions are stored in the folder.
TeklaStructures-<process ID>.err	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. This log file is saved in the %LocalAppdata%\Trimble\TeklaStructures\%Version%\Logs folder.
TmsClientLog_<process ID>_<date>_<instance>.log	Contains diagnostic information and error messages related to the Tekla Model Sharing sharing service, including details about connecting to the sharing service and its status. The log file is saved in %LocalAppdata%\Trimble\TeklaModelSharingFacade\ folder.
tsep-<process ID>.log	Contains information related to the .tsep files. This log file is saved in the %LocalAppdata%\Trimble\TeklaStructures\%Version%\Logs folder.
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 \logs folder under the current model folder.

View a log file

You can view 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 to 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-<process ID>.log`)
 - **Numbering history log** (`numberinghistory.log`)
 - **Saving history log** (`save_history.log`)
 - **Drawing history log** (`drawing_history.log`)
 - **Analysis history log** (`analysis.log`)
3. View the log file in one of the following ways:
 - To view the log file in the log viewer, select **File --> Logs --> View with Tekla Structures log viewer**.
 - To view the log file in the application associated with the file type, select **File --> Logs --> 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-<process ID>.log`. Note that the process ID is always included in the log name. Changing the name of the files and their location is not strictly necessary because the logs do not get overwritten.

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

1. Open a suitable [initialization file \(page 62\)](#) 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
```

The default value is TeklaStructures-<process ID>.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

\AppData\Local\Trimble\Tekla Structures\<version>\Logs.

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

Numbering history log file

The numberinghistory.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.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.log file.

```
① *** Numbering (haka): Thu Jun 14 13:08:08 2012
② Modified numbering
③ Compare modified to old parts
③ Compare new to old parts
④ Check for standard parts
  Use old numbers
⑤ Tolerance: 1.000000
  SteelTolerance: 1.000000
  ConcreteTolerance: 2.000000
  RebarTolerance: 2.000000
⑥ Part      guid: ID510F595D-0000-0017-3133-353939383237  series:Concrete_C-1/1  Concrete_C-1/0 -> Concrete_C-1/1
  Assembly guid: ID510F595D-0000-0016-3133-353939383237  series:C/1  C/0 -> C/1
*** Operation finished Thu Jun 14 13:08:08 2012
```

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.

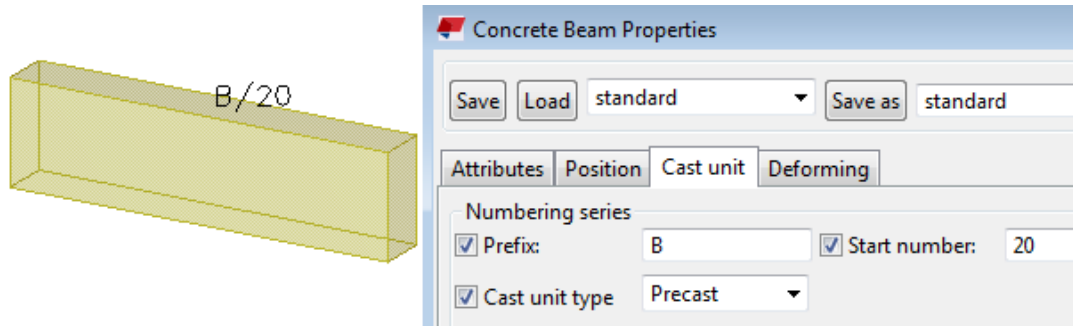
	• Diagnose & Repair Numbering: All is displayed when you run the Diagnose & repair numbering: All command. • Diagnose & Repair Numbering: Series of selected objects is displayed when you run the Diagnose & repair numbering: Series of selected objects command. • Renumber all is displayed when you select the Renumber all option in the Numbering Setup dialog.
3	Some Compare options set in the Numbering Setup dialog are displayed in the <code>numbering.history</code> 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
4	Numbering options. • Use old numbers is displayed only when you have selected the Re-use old numbers option in the Numbering Setup dialog. • Check for standard parts is displayed only when you have selected the Check for standard parts option in the Numbering Setup dialog.
5	Tolerances are set in the Numbering Setup dialog.
6	Changes in the position numbers and in the numbering series during one numbering session.

Numbering series in the numbering history log file

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

Example 1

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

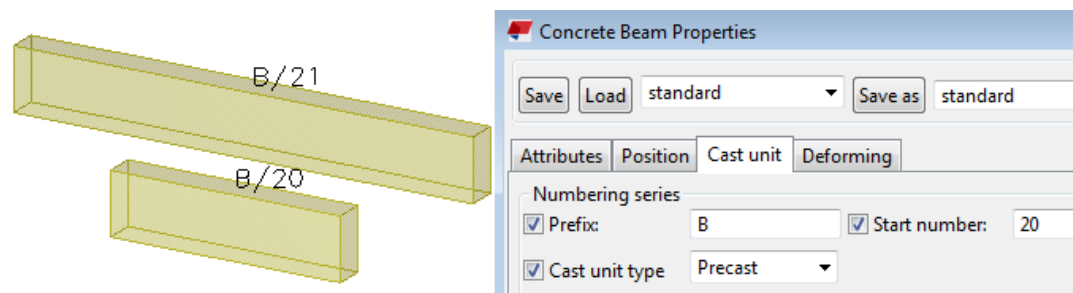


① Part guid: ID510F595D-0000-0030-3133-353939383335 series:Concrete_B-20/1 Concrete_B-20/0 -> Concrete_B-20/1
 ② Assembly guid: ID510F595D-0000-002F-3133-353939383335 series:B/20 B/0 -> B/20

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.log file 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
.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.
.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 .
.db1	Model database
.db2	Numbering database
.dwg, .dxf	Files exported through Export 3D DWG/DXF .
.idrm	Mapping file, which handles IDs. Note: Do not modify this file.
.lis	Export files for catalogs. You can export catalogs and import them to different Tekla Structures

File or file name extension	Description
	models as .lis files. These catalogs include profile, material, and bolt catalogs.
.locked	A temporary file that locks the files in the model folder to prevent modifications while the model is in use.
.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.
.tmp	Stores temporary data.
.tsc	Export files for shapes. You can export shapes and import them to different Tekla Structures models as .tsc files.
<user>_ComponentCatalogUserSettings.xml	Lists the recently used applications and components, and their location in the Applications & components catalog structure.
ClashCheck.history	A file that contains information about clashes found in all past clash checks, and the dates and times of the clash checks.
ClashCheck.log	A log file that contains information about clashes found in the most recent clash check, and the date and time of the clash check.
ComponentCatalog.xml	Contains the model level catalog definitions of the Applications & components catalog.
DocumentManager_<user>.xml	Stores the Document manager window layout changes.
DocumentManagerCategories_<user>.xml	Stores the Document manager category changes.
DocumentManagerDataGridSettings_<user>.xml	Stores the Document manager user interface layout changes.
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.
environment.db	Database for user-defined attribute definitions
history.db	Model history database.

File or file name extension	Description
notification_report.xsr	This file is used to show a notification report of assignments when you open a model.
options_model.db and options_drawings.db	Contain values for model-specific options from the Options dialog and values for model-specific advanced options from the Advanced options dialog. When a model is created, Tekla Structures reads model-specific options and advanced options values from the <code>standard.opt</code> file and <code>.ini</code> files in the environment folders and saves them in these two databases.
pgdb.bin	Profile geometry database. It stores cross-section geometries for sketched profiles that have been solved using the Sketch Solver. When you edit sketched profiles or define new profiles, Tekla Structures checks for the installation of the Sketch Solver component. Once installed from Tekla Warehouse, the Sketch Solver solves sketched profiles and stores the results in the <code>pgdb.bin</code> 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.
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.
wizard.log	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.
WorkTypeProperties.xml	Lists allowed property types and their units.
Worktypes.xml	Lists available task types. This file is created when you start the Task manager .

File or file name extension	Description
<code>xs_user.<username></code>	Contains interface settings specified by the user. This file contains settings for many of the options in the Options dialog and the settings for the icons on the Selecting and Snapping toolbars. Each time a model is saved, an <code>xs_user.<username></code> file is created or updated. These settings are user-specific. If the <code>xs_user.<username></code> file is not found in the model folder when you open the model, Tekla Structures searches for the <code>xs_user.default</code> file in the following folder search order: 1. Model folder 2. <code>model\attributes</code> 3. Project folder 4. <code>XS_FIRM\attributes</code> 5. System folder If this file is not found, the Tekla Structures default settings are used.
<code>xldb.xs</code>	This file is used to show the name of the model in the Open dialog.
<code>xslib.db1</code>	Contains information about user-defined connections and details, and default component descriptions.
<code>xslib.db2</code>	Contains numbering information.

Files in the \Analysis folder

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

Files in the \attributes folder

File or file name extension	Description
.4d	Project status visualization properties
.admodel	Analysis model properties
.admodel.more	Analysis model user-defined attribute properties
.adnode	Analysis node properties
.adnode.more	Analysis node user-defined attribute properties
.blp	Bent plate properties
.blp.more	Bent plate user-defined attribute properties
.BvbsExport.BvbsExportForm.xml	BVBS export properties
.cbm	Concrete beam or concrete polybeam properties
.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.
.cbm.more	Concrete beam or concrete polybeam user-defined attribute properties
.ccl	Concrete column properties
.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.
.ccl.more	Concrete column user-defined attribute properties
.cha	Edge chamfer properties
.cha.more	User-defined edge chamfer attribute properties
.clm	Steel column properties
.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.
.clm.more	Steel column user-defined attribute properties
.cnarc	Construction arc properties
.cncl	Construction circle properties
.cnl	Construction line properties
.cnplycrv	Construction polycurve properties

File or file name extension	Description
<code>.ColorPalette.xml</code>	Custom color palette file saved in color palette editing mode.
<code>.cpf</code>	Pad footing properties
<code>.cpf_ad, .cpf_design</code>	File types associated with pad footing analysis property settings. <code>.cpf_ad</code> contains information associated with the analysis part properties and <code>.cpf_design</code> contains information associated with the actual pad footing design.
<code>.cpf.more</code>	Pad footing user-defined attribute properties
<code>.cpl</code>	Contour plate properties
<code>.cpl_ad, .cpl_design</code>	File types associated with contour plate analysis property settings. <code>.cpl_ad</code> contains information associated with the analysis part properties and <code>.cpl_design</code> contains information associated with actual contour plate design.
<code>.cpl.more</code>	Contour plate user-defined attribute properties
<code>.cpn</code>	Concrete panel properties
<code>.cpn_ad, .cpn_design</code>	File types associated with concrete panel analysis property settings. <code>.cpl_ad</code> contains information associated with the analysis part properties and <code>.cpl_design</code> contains information associated with the actual concrete panel design.
<code>.cpn.more</code>	Concrete panel user-defined attribute properties
<code>.crs</code>	Orthogonal beam properties
<code>.crs_ad, .crs_design</code>	File types associated with orthogonal steel beam analysis property settings. <code>.crs_ad</code> contains information associated with the analysis part properties and <code>.crs_design</code> contains information associated with orthogonal steel beam design.
<code>.crs.more</code>	Orthogonal beam user-defined attribute properties
<code>.csb</code>	Concrete spiral beam properties
<code>.csb.more</code>	Concrete spiral beam user-defined attribute properties
<code>.csf</code>	Strip footing properties
<code>.csf_ad, .csf_design</code>	File types associated with strip footing analysis property settings. <code>.csf_ad</code> contains information associated with the analysis part properties and <code>.csf_design</code> contains information associated with the actual strip footing design.
<code>.csf.more</code>	Strip footing user-defined attribute properties

File or file name extension	Description
.csl	Concrete slab properties
.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.
.csl.more	Concrete slab user-defined attribute properties
.dgnExport.json	3D DGN v. 8 export properties
.dia	Twin profile properties
.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.
.dia.more	Twin profile user-defined attribute properties
.dwgExport.json	3D DWG export properties
.dwgsetting	Drawing export properties (Export drawings as DWG/DXF)
.ExportIFC.MainDialog	IFC export properties
.ExportSketchup.MainDialog.xml	Sketchup export properties
.grd	Rectangular grid properties
.grd.more	Rectangular grid user-defined attribute properties
.grdp	Grid line properties
.grdp.more	Grid line user-defined attribute properties
.gvi	Saved properties for creating views along grid lines
.HmsExport.HmsExportForm.xml	HMS export properties
.ias	Cast-in-place cast unit properties
.IFCObjGrp	IFC object group filter properties
.ipc	Concrete item properties
.ipc.more	Concrete item user-defined attribute properties
.ips	Item properties
.ips.more	Item user-defined attribute properties
.it	Report template used in Custom inquiry
.lco	Load combination properties
.lml	Point load properties

File or file name extension	Description
.lm2	Line load properties
.lm3	Area load properties
.lm4	Uniform load properties
.lm6	Temperature load properties
.lpl	Lofted plate properties
.lpl.more	Lofted plate user-defined attribute properties
.lsl	Concrete lofted slab properties
.lsl	Concrete lofted slab user-defined attribute properties
.m10000015	Import attribute properties
.m10000016	Cover sheet export properties
.m10000017	FabTrol XML import properties
.m10000028	Wind load properties
.m1000004	FEM export properties
.m1000007	CAD export properties
.m1000009	Control number properties
.m1000010	Control number locking properties
.m160000079	Unitechnik export properties
.m170000068	ELiPLAN export properties
.m440000003	3D DGN export properties
.m440000004	3D DWG/DXF export 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

File or file name extension	Description
	Component end view: component_end_view Component perspective view: component_persp_view 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
.ncf	NC file properties
.num	Numbering setup properties
.OrgObjGrp	Organizer filter properties
.pas	Precast cast unit properties
.pbreak	Pour break properties
.PObjGrp	Object group filter properties
.pour .pour.more	Pour object properties and user-defined attributes
.prt	Steel beam 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.

File or file name extension	Description
.prt.more	Steel beam user-defined attribute properties
.punit .punit.more	Pour unit properties and user-defined attributes
.ras	Rebar assembly properties
.rbg	Reinforcing bar group properties
.rbg.more	Reinforcing bar group user-defined attribute properties
.rbm	Reinforcement mesh properties
.rbm.more	Reinforcement mesh user-defined attribute properties
.rbr	Reinforcing bar properties
.rbr.more	Reinforcing bar user-defined attribute properties
.rbs	Reinforcement strand pattern properties
.rbs.more	Reinforcement strand pattern user-defined attribute properties
.rci .rci.more	Circular reinforcing bar group properties and user-defined attributes
.rcu .rcu.more	Curved reinforcing bar group properties and user-defined attributes
.rep	Object representation properties
.rgrd	Radial grid properties
.rgrd.more	Radial grid user-defined attribute properties
.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
.rpr	Report properties
.rsp	Reinforcement splice properties
.rsp.more	Reinforcement splice user-defined attribute properties
.rst	Rebar set properties
.rst_edm	Rebar set end detail modifier properties
.rst_edm.more	Rebar set end detail modifier user-defined attribute properties
.rst_ls	Rebar set leg surface properties

File or file name extension	Description
.rst_pm	Rebar set property modifier properties
.rst_pm.more	Rebar set property modifier user-defined attribute properties
.rst_sm	Rebar set splitter properties
.rst.more	Rebar set user-defined attribute properties
.sas	Assembly properties
.sb	Steel spiral beam properties
.sb.more	Steel spiral beam user-defined attribute properties
.scr	Bolt properties
.scr.more	User-defined bolt attribute properties
.SObjGrp	Model selection filter properties
.srf	Surface treatment properties
.srf.more	User-defined surface treatment attribute properties
.srfo	Surface properties
.srfo.more	User-defined surface attribute properties
.VObjGrp	Model view filter properties
.wld	Weld properties
.wld.more	User-defined weld attribute properties
*.udwcs	User-defined weld cross sections (UserDefinedWeldCrossSections.udwcs)
standard.opt	Settings are saved in <code>standard.opt</code> in the <code>\attributes</code> folder only when you save your own settings in the Options dialog using Save . There is a <code>standard.opt</code> 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
.dgr	Object-level grid properties
.dim	Object-level dimension properties
.dimension_mark	Object-level dimension tag properties
.dprrt	Object-level part properties
.drbr	Object-level reinforcement properties
.drmsb	Object-level reinforcement mesh properties
.drtxt	Object-level text properties
.dsrf	Object-level surface treatment properties
.gar	Object-level arc properties
.gci	Object-level circle properties
.gln	Object-level line properties
.gpg	Object-level polygon and cloud properties
.gpl	Object-level polyline properties
.grt	Object-level rectangle properties
.jm	Object-level connection mark properties
.lev	Object-level level mark properties
.mrm	Object-level merged reinforcement mark properties
.note	Object-level associative note properties
.pm	Object-level part mark properties
.po	Object-level pour object properties
.pom	Pour object mark properties
.rdim	Object-level rebar dimension mark properties
.rev	Object-level revision mark properties
.rm	Object-level reinforcement mark properties
.sbl	Object-level symbol properties
.sc	Object-level bolt properties
.sm	Object-level bolt mark properties
.surfm	Object-level surface treatment mark properties

File or file name extension	Description
.wls	Object-level weld mark properties

View-level drawing settings saved in the \attributes folder

File or file name extension	Description
.GridsDimXml .ShapeDimXml .HolesDimXml .FilterDimXml .OverallDimXml .RecessesDimXml .SecPartsDimXml .NeighborDimXml .SpiralBeamDimXML	Dimensioning rules
.vclassif .vclassif.copt	View-level detailed object-level settings
.vf	View-level filter properties
.vg	View-level grid properties
.vi .vi.copt	View-level view properties
.viewdim	View-level dimension properties
.vjm	View-level connection mark properties
.vnf	View-level neighbor part filter properties
.vnp	View-level neighbor part properties
.vnpm	View-level neighbor part mark properties
.vnr	View-level neighbor reinforcement properties
.vnrm	View-level neighbor reinforcement mark properties
.vp	View-level part properties
.vpm	View-level part mark properties
.vpo	View-level pour object properties
.vpom	View-level pour object mark properties
.vr	View-level reinforcement properties
.vrm	View-level reinforcement mark properties
.vrmp	View-level reference object properties
.vs	View-level bolt properties

File or file name extension	Description
.vsm	View-level bolt mark properties
.vsurf	View-level surface treatment properties
.vsurfm	View-level surface treatment mark properties
.vw	View-level welding properties

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

File or file name extension	Description
.wd.more	Single-part drawing user-defined attributes
.wd .wd.copt	Single-part drawing properties
.wdc	Single-part drawing section view properties
.wdc.more	Single-part drawing user-defined section view attributes
.wdcd	Single-part drawing dimensioning properties
.wdcd more	Single-part drawing user-defined dimensioning attributes
.wdd	Single-part drawing dimension properties
.wdd.more	Single-part drawing user-defined dimension attributes
.wdf	Single-part drawing filter properties
.wdgr	Single-part drawing grid properties
.wdgr.more	Single-part drawing user-defined grid attributes
.wdl	Single-part drawing layout properties
.wdl.more	Single-part drawing user-defined layout attributes
.wdnf	Single-part drawing neighbor part filter properties
.wdnp	Single-part drawing neighbor part properties
.wdnp.more	Single-part drawing user-defined neighbor part attributes
.wdp	Single-part drawing part properties
.wdr	Single-part drawing protection properties
.wdr.more	Single-part drawing user-defined protection attributes
.wds	Single-part drawing bolt properties

File or file name extension	Description
.wds.more	Single-part drawing user-defined bolt attributes
.wdsrf	Single-part drawing surface treatment properties
.wdsrf.more	Single-part drawing user-defined surface treatment attributes
.wdsurfm	Single-part drawing surface treatment mark properties
.wdsurfm.more	Single-part drawing user-defined surface treatment mark attributes
.wdv	Single-part drawing view properties
.wdv.more	Single-part drawing user-defined view attributes
.wjm	Single-part drawing connection mark properties
.wnpm	Single-part drawing neighbor part mark properties
.wpm	Single-part drawing part mark properties
.wsection_mark_a1 - a5	Single part drawings: section mark properties in section views
.wsm	Single-part drawing bolt mark properties

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
.adc	Assembly drawing section view properties
.adcd	Assembly drawing dimensioning properties (Integrated dimensioning)
.adcd.more	Assembly drawing user-defined dimensioning attributes
.add	Assembly drawing dimension properties
.add.more	Assembly drawing user-defined dimension attributes
.adf	Assembly drawing filter properties
.adgr	Assembly drawing grid properties
.adgr.more	Assembly drawing user-defined grid attributes

File or file name extension	Description
.adl	Assembly drawing layout properties
.adl.more	Assembly drawing user-defined layout attributes
.adnf	Assembly drawing neighbor part filter properties
.adnp	Assembly drawing neighbor part properties
.adnp.more	Assembly drawing user-defined neighbor part attributes
.adp	Assembly drawing part properties
.adp.more	Assembly drawing user-defined part attributes
.adr	Assembly drawing protection properties
.ads	Assembly drawing bolt properties
.adsrf	Assembly drawing surface treatment properties
.adsrf.more	Assembly drawing user-defined surface treatment attributes
.adsurfm	Assembly drawing surface treatment mark properties
.adsurfm.more	Assembly drawing user-defined surface treatment mark attributes
.adv	Assembly drawing view properties
.adw	Assembly drawing welding properties
.adw.more	Assembly drawing user-defined welding attributes
.ajm	Assembly drawing connection mark properties
.anpm	Assembly drawing neighbor part mark properties
.apm	Assembly drawing part mark properties
.asection_view_mark_a1 - a5	Assembly drawings: section mark properties in section views
.asm	Assembly drawing bolt mark 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
.cudc	Cast unit drawing section view properties
.cudc.more	Cast unit drawing user-defined section view attributes
.cudcd	Cast unit drawing dimensioning properties (Integrated dimensioning)
.cudcd.more	Cast unit drawing user-defined dimensioning properties
.cudd	Cast unit drawing dimension properties
.cudd.more	Cast unit drawing user-defined dimension attributes
.cudgr	Cast unit drawing grid properties
.cudgr.more	Cast unit drawing user-defined grid attributes
.cudl	Cast unit drawing layout properties
.cudl.more	Cast unit drawing user-defined layout attributes
.cudnp	Cast unit drawing neighbor part properties
.cudnp.more	Cast unit drawing user-defined neighbor part attributes
.cudp	Cast unit drawing part properties
.cudp.more	Cast unit drawing user-defined part attributes
.cudr	Cast unit drawing reinforcement properties
.cudr.more	Cast unit drawing user-defined reinforcement attributes
.cudrm	Cast unit drawing reinforcement mark properties
.cudrm.more	Cast unit drawing user-defined reinforcement mark attributes
.cudrp	Cast unit drawing protection properties
.cudrp.more	Cast unit drawing user-defined protection attributes
.cuds	Cast unit drawing bolt properties
.cuds.more	Cast unit drawing user-defined bolt attributes
.cudsrff	Cast unit drawing surface treatment properties

File or file name extension	Description
.cudsrf.more	Cast unit drawing user-defined surface treatment attributes
.cudsurfm	Cast unit drawing surface treatment mark properties
.cudsurfm.more	Cast unit drawing user-defined surface treatment mark attributes
.cudv	Cast unit drawing view properties
.cudv.more	Cast unit drawing user-defined view attributes
.cudw	Cast unit drawing welding properties
.cudw.more	Cast unit drawing user-defined welding attributes
.cuf	Cast unit drawing filter properties
.cunf	Cast unit drawing neighbor part filter properties
.cunpm	Cast unit drawing neighbor part mark properties
.cupm	Cast unit drawing part mark properties
.cusection_mark_a1 - a5	Cast unit drawings: section mark properties in section views
.cusm	Cast unit drawing bolt mark properties

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

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

File or file name extension	Description
.gdf	General arrangement drawing filter properties
.gdgr	General arrangement drawing grid properties
.gdgr.more	General arrangement drawing user-defined grid attributes
.gdl	General arrangement drawing layout properties
.gdl.more	General arrangement drawing user-defined layout attributes
.gdnf	General arrangement drawing neighbor part filter properties
.gdnp	General arrangement drawing neighbor part properties
.gdnp.more	General arrangement drawing user-defined neighbor part attributes
.gdp	General arrangement drawing part properties
.gdp.more	General arrangement drawing user-defined part attributes
.gdr	General arrangement drawing reinforcement properties
.gdr.more	General arrangement drawing user-defined reinforcement attributes
.gdrm	General arrangement drawing reinforcement mark properties
.gdrm.more	General arrangement drawing user-defined reinforcement mark attributes
.gdrmp	General arrangement drawing reference object properties
.gdrmp.more	General arrangement drawing user-defined reference model attributes
.gdrp	General arrangement drawing protection properties
.gdrp.more	General arrangement drawing user-defined protection attributes
.gds	General arrangement drawing bolt properties
.gds.more	General arrangement drawing user-defined bolt attributes
.gdsrf	General arrangement drawing surface treatment properties
.gdsurfm	General arrangement drawing surface treatment mark properties

File or file name extension	Description
.gdsurfm.more	General arrangement drawing user-defined surface treatment mark attributes
.gdv	General arrangement drawing view properties
.gdv.more	General arrangement drawing user-defined view attributes
.gdw	General arrangement drawing welding properties
.gdw.more	General arrangement drawing user-defined welding attributes
.gjm	General arrangement drawing connection mark properties
.gnpm	General arrangement drawing neighbor part mark properties
.gnr	General arrangement drawing neighbor reinforcement properties
.gnrm	General arrangement drawing neighbor reinforcement mark properties
.gpbr	General arrangement drawing pour break properties
.gpm	General arrangement drawing part mark properties
.gpo	General arrangement drawing pour object properties
.gpom	General arrangement drawing pour object mark properties
.gsm	General arrangement drawing bolt mark 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
.cs	Section mark properties
.detail	Detail mark properties
.dg	Drawing files
.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.
.dsf	Drawing selection filter properties. This file is saved when you select the Drawing --> Selection filter checkbox in the Filter or Selection Filter properties.
.fas	Text file properties
.fh1	Hyperlink properties
.ldb	Drawing export layer properties
.ldr	Drawing link properties

Files created in the \DataStorage\ref folder

When a reference model is inserted or updated, reference model data is automatically copied to the <current model>\DataStorage\ref folder. There is no need to manually copy reference models to the model folder. Duplicated data can use a large amount of disk space and might make copying or sharing the model using Tekla Model Sharing unnecessarily slow.

File or file name extension	Description
.ifc, .ifc4, .ifcZIP, .ifcXML, .tcZIP, .3dd, .dxf, .dwg, .dgn, .xml, .Lan dXML, .stp, .igs, .skp, .pdf	Reference model files in different formats
.logxml	Reference model import log
.trb	A TrimBIM file converted from the reference model file

Files created in the \Plotfiles folder

File or file name extension	Description
.dwg	Drawing DWG files exported through Export drawings as DWG/DXF .
.pdf	Printed PDF files
.plt	Printed plotter files

Files created in the \DGN folder

File or file name extension	Description
.dgn	Files created through the 3D DGN v8 export.

Files created in the \Drawing Details folder

File or file name extension	Description
.ddf	Details created in 2D Library in drawings together with metadata.

Files related to IFC export in the \IFC folder

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

Files in the \ProjectOrganizer folder

File or file name extension	Description
.category	Created when you export a category from the Organizer .
.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 .

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

Files related to options and advanced options

About model-specific options and advanced options

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

You can only change model-specific advanced options in the **Advanced Options** dialog or in the options.ini file located in the model folder. You cannot change model-specific advanced options in an options.ini file located in folders defined by the or advanced option.

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 specific [reading order \(page 62\)](#). Tekla Structures creates the options_model.db and options_drawings.db databases, and the options.ini file in the model folder.

The .ini files are also read when you open an existing model, but only new advanced options that do not exist in the options_model.db or options_drawings.db database are inserted. For example, options that are not yet in the **Advanced Options** dialog but that have been added in the software would be inserted.

When you change model-specific options or advanced options

- You can change model-specific advanced options only in the **Advanced Options** dialog or in the options.ini file that is located in the model folder.
- You can change model-specific options only in the [dialog \(page 134\)](#) dialog manually or by loading standard.opt file values in the dialog.

When you save your own model-specific settings in the **Options** by pressing **Save**, the standard.opt file is saved in the \attributes folder under the model folder.

- When you change a [model-specific \(page 155\)](#) option or advanced option, 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 in the model folder when the model is saved.

- The `options.ini` file located in the folder also contains some special model-specific advanced options that can be updated, such as new advanced options that are not yet in the **Advanced Options** dialog.

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

- You can change user-specific advanced options in the **Advanced Options** dialog or by editing the `user.ini` file.
- You can change user-specific options only in the **Options** dialog manually or by loading `standard.opt` file values in the dialog.
- When you change a [user-specific \(page 155\)](#) option or advanced option, 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.

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.

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

The **Options** dialog (**File --> Settings --> Options**) contains the current values for many Tekla Structures settings.

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

The [model-specific \(page 155\)](#) settings in this dialog are saved in the `options_model.db` and `options_drawings.db` databases in the model folder, and the [user-specific \(page 155\)](#) settings in `options.bin` in your local `<user>` folder. Changing user- or model-specific options in the **Options** dialog does not require you to restart Tekla Structures.

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.

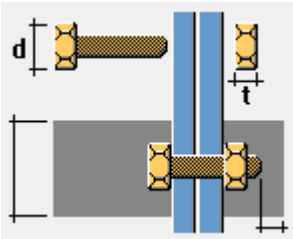
The options in the **Options** dialog are described below.

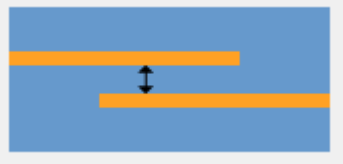
Clash check settings

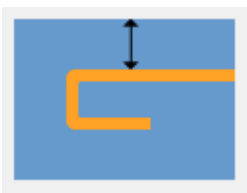
Settings on this page are model-specific. Changing the settings does not require you to restart Tekla Structures.

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, the clash is not reported. The unit for the allowed penetration volume is the unit selected in Options --> Units and decimals --> Catalogs --> Volume .
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 checks 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.

Option	Description
	If you clear the checkboxes, the clearance is 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 checks 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 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 checkbox, Tekla Structures does 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 checkbox, Tekla Structures does not check the clearance.

Option	Description
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 checkbox, Tekla Structures does 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 dialogs override these settings. Tekla Structures only uses these settings if the corresponding boxes in the component dialogs are empty.

If you change components settings, Tekla Structures only applies the new settings to components that you create after you change the settings. Components that you created before you changed the settings are not affected.

NOTE In some cases, the new default part numbering settings can also affect the part numbers of components that you created before you changed the settings. For example, if you modify a component that was created before you changed the default part start numbers, the new default part start numbers are applied to the modified component.

Settings on this page are model-specific. Changing the settings does not require you to restart Tekla Structures.

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

Option	Description
	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. Check the part numbering settings against the numbering series that you define to make sure that 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

Settings on this page are model-specific. Changing the settings does not require you to restart Tekla Structures.

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:

Option	Description
	- 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.
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

Settings on this page are model-specific. Changing the settings does not require you to restart Tekla Structures.

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.

General settings

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

Option	Description
Autosave	Autosave interval: Autosave after every xx minutes defines the number of minutes after which Tekla Structures automatically saves the model and drawing. 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
Default adaptivity	Off means that adaptivity is not defined. Changes in the parent part do not affect objects that are attached to the part. 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 attached object separately. These modifications override the default settings in the Options dialog. 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.

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

Numbering settings

Settings on this page are model-specific. Changing the settings does not require you to restart Tekla Structures.

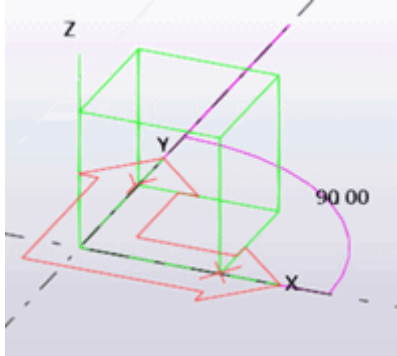
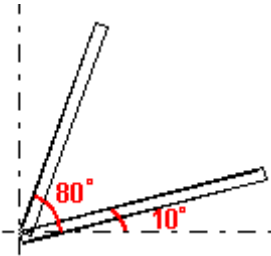
Option	Description
Position number separator	Defines the default position number separator. The options are dot (.), comma (,), slash (/), and hyphen (-).
Rebar position number separator	Defines the default reinforcement position number separator. The options are dot (.), comma (,), slash (/), and hyphen (-).
Rebar sequence number separator	Defines the default reinforcement sequence 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

Settings on this page are model-specific. Changing the settings does not require you to restart Tekla Structures.

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

Option	Description
	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 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

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 you to restart Tekla Structures, but you

must 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.
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 the user-defined attributes of property modifiers. These modifications override the default settings in the Options dialog.
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.

Option	Description
	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.
Cut creation	In Automatically create cuts, select whether the cuts in the parent parts are created to the rebar sets when the rebar sets are created. In Do not create cuts smaller than, define the minimum dimension for the cuts to be created. For round cuts, this dimension is the diameter, for rectangular cuts, the shortest edge of the cut, and for polygonal cuts, the shortest edge of the object-oriented bounding box around the cut.
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

Settings on this page are model-specific. Changing the settings does not require you to restart Tekla Structures. 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.

Length
mm
2

Angle
°
2

Spring constant
kg/m
2

Rot. spring constant
kgm/rad
2

Factor
2

For more information about unit and decimal settings, see [Change units and decimals \(page 154\)](#).

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

Option	Units
	daN/cm daN/mm 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

Option	Units
	lbf kip
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

Option	Units
	kNm/m 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 reforc.	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

Change units and decimals

You can define which units and how many decimals Tekla Structures uses. The settings are model-specific.

Note that these settings do not have any effect on drawings or reports, or on the **Inquire** tools. For example, to change the units used in the **Custom Inquiry** tool, edit the `InquiryTool.config` file.

1. On the **File** menu, click **Settings --> Options**, and go to the **Units and decimals** settings.
2. Modify the units and decimals to suit your needs.

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.

- The settings on the **Modeling** tab affect the data that is used when you are modeling, for example copying, moving, creating grids, creating points, and so on.
- The settings on the **Catalogs** tab affect the profile and material data, for example catalogs.
- The settings on the **Analysis results** tab affect the output data.
Reinforcement area and **Mass/Length** also affect cross section area and weight per unit length in the [rebar catalog \(page 408\)](#).
- The settings on the **MEP** tab affect the data that is used in mechanical, electrical, and plumbing design and construction.

3. Click **OK** to save the changes.

See also

[Settings in the Options dialog \(page 134\)](#)

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, 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, the type is **MODEL** or **DRAWING**.

Some special model-specific options that are not visible in the **Advanced Options** dialog 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, 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 68) 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 69) 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 69) 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 \(page 62\)](#).

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 \(page 62\)](#)

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 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.

3.9 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 \(page 17\)](#) 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 \(page 181\)](#).
- Plan how users will share models and data. See [Set up a project for collaboration and interoperability \(page 244\)](#).
- Check the material, profile, shape, bolt, and rebar needs for your project. Plan how you will [Customize catalogs and databases \(page 285\)](#) 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 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 or Tekla Structures versions \(page 160\)](#).

Settings stored in the [Project and firm folders \(page 17\)](#) 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. See .
- 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 so that they contain the relevant content for your project. See [Customize catalogs and databases \(page 285\)](#).

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. See .

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 \(page 17\)](#) 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 \(page 133\)](#)
 - [Files \(page 57\)](#) related to templates, reports and drawings
 - [Catalog files \(page 96\)](#): profile catalog, material catalog, bolt catalog, bolt assembly catalog, rebar shape catalog
 - [Conversion files \(page 254\)](#)
 - 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:

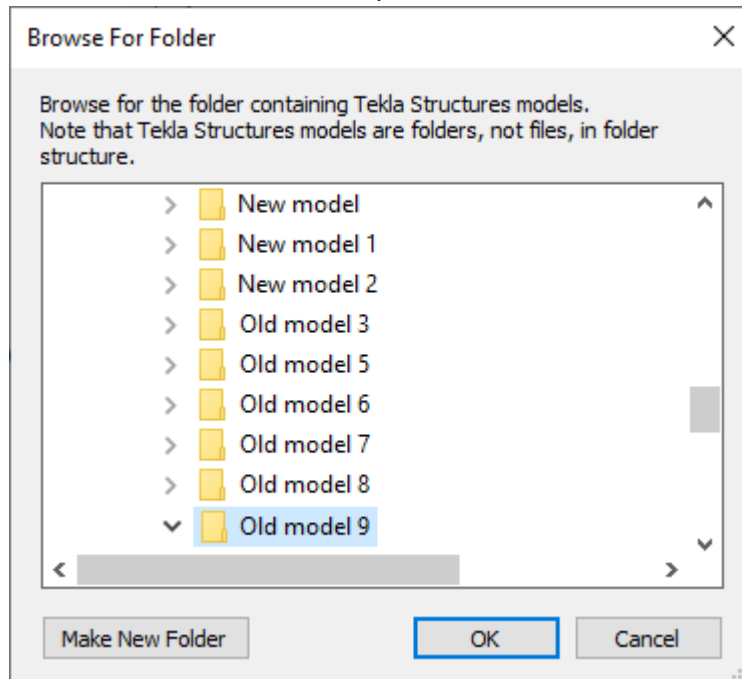
- Import the model into a new blank model due to some issues in the model, such as when:
 - The model is corrupt.
 - There are corrupt parts in the model.
 - The model will not open.
 - A specific function causes an application error, such as numbering or creating a drawing.
- Merge models.
- Bring an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

Some things to consider before importing:

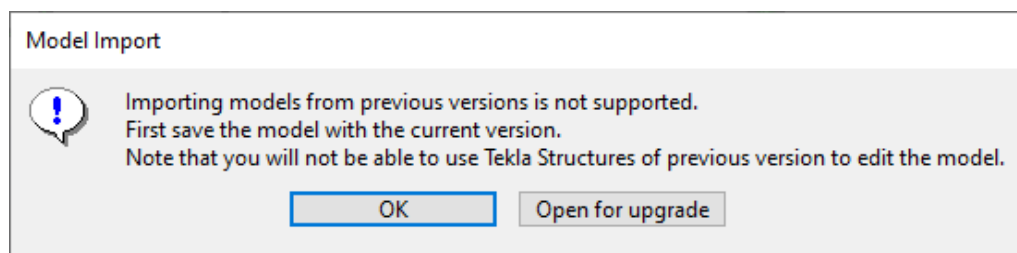
- The model import will not succeed if both models were started with the same model template.
- The import only works in one direction. It cannot be used for two-directional data exchange. For that we recommend using Tekla Model Sharing.
- If you import into an existing model, fix the possible numbering 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.
- A log is created at the model import. You can use the advanced option XS_IMPORT_MODEL_LOG to control whether a new log is created every

time you import a model, or if the log entries are appended to the existing log.

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**.



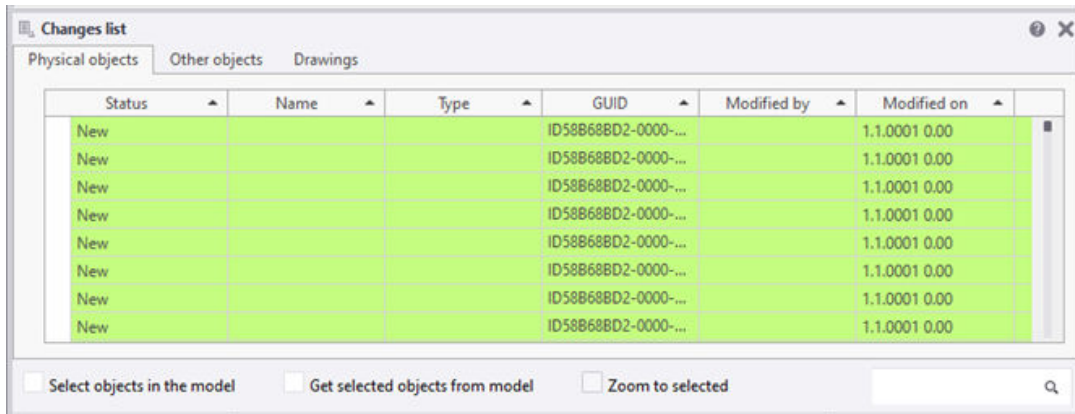
If you open a model from a previous Tekla Structures version, the following message is shown:



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

The model objects and drawings are imported. If you import one project to another, there is a revision check. The changes are shown using the same listing as is used in Tekla Model Sharing.

So if you import a model first and then later a progress version of the model, it does not duplicate anything but it shows you what is new, what is changed, what was deleted, and what was unchanged.

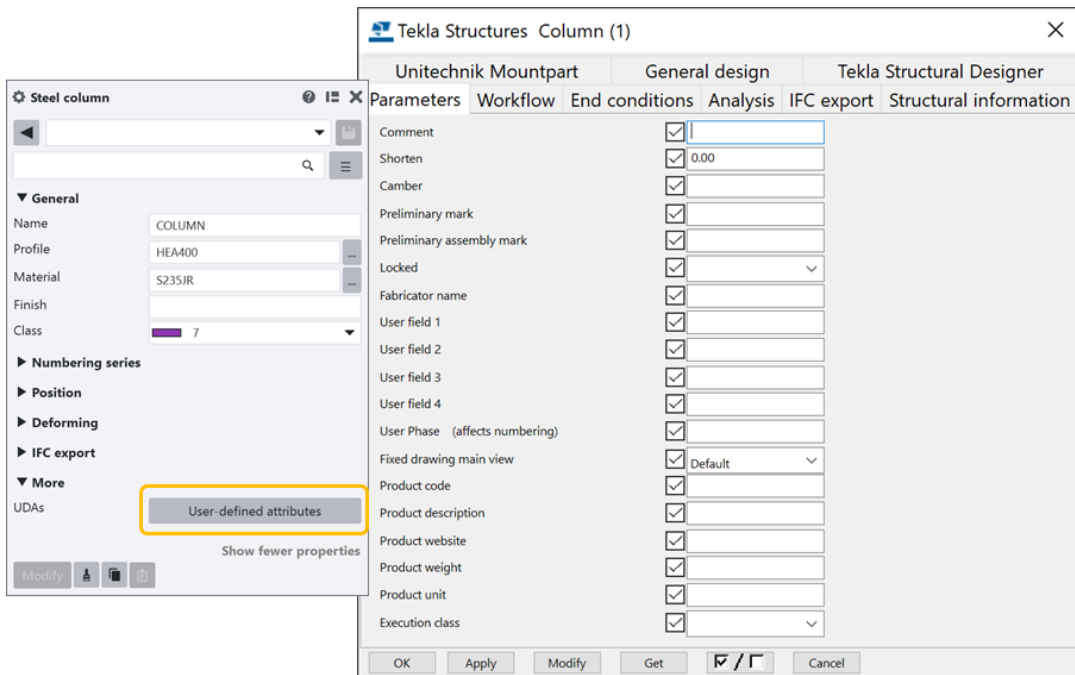


With default settings, the **Locked** attribute is set to **Yes** in the imported objects. Locking is controlled by the advanced option `XS_MODEL_IMPORT_LOCK_OBJECTS` in the **Import** category of the **Advanced options** dialog.

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 dialogs contain UDAs for various objects, including beams, columns, bolts, and drawings. Tekla Structures shows these fields when you click the **User-defined attributes** button in the property pane or in a dialog.



About creating 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 of options, 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.

User-defined attributes are managed in `objects.inp` files. There are several `objects.inp` files in the `..\environments\common\inp\` folder that define user-defined attributes for different tabs of the **User-defined attributes** dialog.

For more information about the contents of `objects.inp` files, see [Properties of objects.inp files \(page 173\)](#).

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

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

Best practice for user-defined attribute names

Follow these best practices for user-defined attribute names.

- User-defined attribute names must be unique. Make sure that the global `objects.inp` file does not already use the same attribute name.
- For project-specific user-defined attributes, add the prefix `P_` before the user-defined attribute name. For example, `P_RESP_DESIGNER`.
- 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.
- User-defined attribute names are case-sensitive.
- Do not use spaces or reserved characters in attribute names.

Best practices for user-defined attribute definitions

Follow these best practices for user-defined attribute definitions.

- The definition of the user-defined attribute must be 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.

Best practices for user-defined attribute translations

For user-defined attributes that will be translated, add the prefix `j_` before the label text in the `objects.inp` file.

Example:

```
attribute("releases", "j_MomentConnection", label, "%s", no, none, "0.0",
"0.0", 30, 310)
```

Add the strings to be translated to the relevant `.ail` message files. For more information, see [Customize user interface text in message files \(page 91\)](#).

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	<code>XS_PROJECT</code> (your defined project folder)
Firm	<code>XS_FIRM</code> (your defined firm folder)
System	<code>XS_SYSTEM</code> (your defined system folder)
inp	<code>XS_INP</code> (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 way you can have several `objects_<suffix>.inp` files in the same folder. For example, a file name with a suffix could be `objects_precast.inp`.

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 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` 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)}

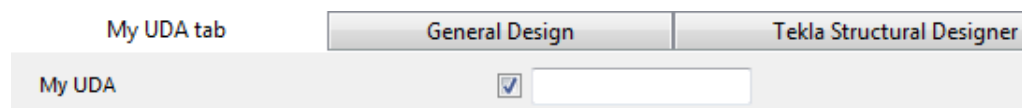
```

In this example, the [special_flag property \(page 173\)](#) is set to `no`. If you want to create a user-defined attribute that also affects numbering, set the `special_flag` property of the attribute to `yes`.

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 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`.

Object classes with Objects.inp differences compared to current settings		
Current settings	Object class names	Objects.inp settings
unique=no	part column	unique=yes

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.

Example: Add a tab page to the definitions of user-defined attributes

The tab page display order is defined by the last number in the definition row. Avoid using the same page numbers that are already used in the `object.inp` file in the common environment.

1. Define the tab page content.

```
tab_page("", "jd_Parameters", 3)
{
    attribute("PROJECT_COMMENT", "j_proj_comment", string, "%s", no,
none, "0.0", "0.0")
    {
        value("", 0)
    }
}
```

2. Add the tab page content to drawing objects for GA drawings and multidrawings.

```
/
*****
*/
/* Drawing attributes - GA */
/
*****
*/
gadrawing(0, "j_GA_drawing")
{
    tab_page("DR_Workflow", "jd_Workflow", 8)
    tab_page("DR_Parameters", "jd_Parameters", 9)
    modify(1)
}
/
*****
*/
/* Drawing attributes - multi */
/
*****
*/
multidrawing(0, "j_Multi_drawing")
{
    tab_page("DR_Workflow", "jd_Workflow", 8)
    tab_page("DR_Parameters", "jd_Parameters", 9)
    modify(1)
}
```

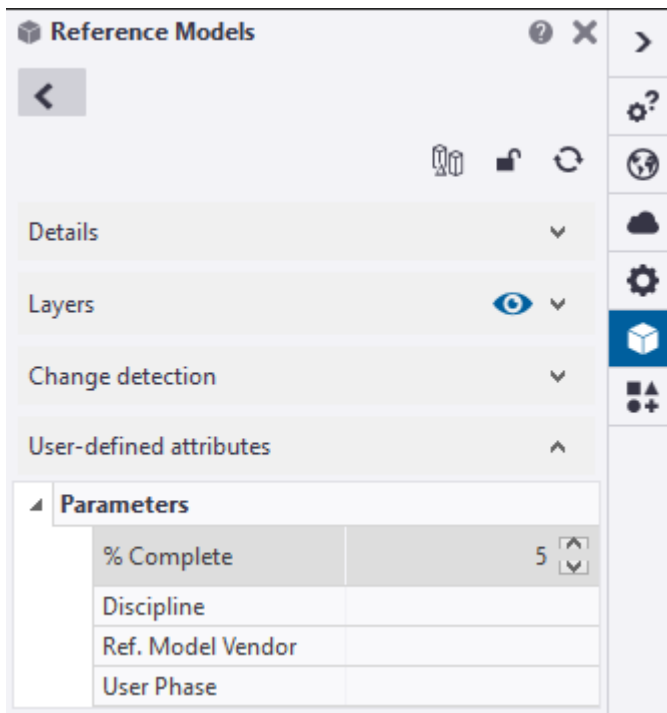
Add UDAs in reference models

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 objects.inp files

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

For general information about modifying the definitions, such as file locations and reading order, see [Define and update user-defined attributes \(UDAs\) \(page 164\)](#).

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

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

```

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 to make the name unique, such as your

Property	In the example	Description
		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 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 such as <code>j_comment</code>, meaning that the prompt comes from the <code>joints.ail</code> message file.
value_type	string	The type of value that the field can contain. If you need to change the <code>value_type</code>, create a new user-defined attribute instead of modifying the current one in the <code>objects.inp</code> file. For example, if you change the <code>value_type</code> from <code>string</code> to <code>option</code>, 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 <code>XS_DIAGNOZE_AND_REPAIR_WRONG_UDA_TYPE</code> is set to <code>TRUE</code>, 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 <code>string</code> or <code>option</code>,

Property	In the example	Description
		defined in the <code>objects.inp</code> file match their values defined in <code>environment.db</code> . A mismatch can happen if you change the value types after the UDA values have been assigned.
<code>field_format</code>	<code>%s</code>	The format of the field in the dialog • <code>%s</code> for strings • <code>%d</code> for numbers
<code>special_flag</code>	<code>no</code>	• For parts: Specifies whether the part is considered in numbering. • For drawings: Specifies whether the attribute value is shown in the Document manager. • For other elements: This property has no effect. Enter <code>no</code> or <code>yes</code>. The special flag is not considered for the <code>FixedMainView</code> attribute.
<code>check_switch</code>	<code>none</code>	This property is not used. Always enter <code>none</code> .
<code>attribute_value_max</code>	<code>0.0</code>	This property is not used. Always enter <code>0.0</code> .
<code>attribute_value_min</code>	<code>0.0</code>	This property is not used. Always enter <code>0.0</code> .
<code>value("attribute_value", default_switch)</code>	<code>value ("", 0)</code>	The value of the attribute and whether the value is the default value. The <code>attribute_value</code> text between the quotation marks is the value of the attribute. The type of value that you can enter depends on the value type of the attribute. If there is no text between the quotation marks, the value is left empty. When the value type is <code>option</code>, one of the values in the list of values can be set as the default value. The <code>default_switch</code> number after the comma specifies whether the value is the default value:

Property	In the example	Description
		2: The value is the default value, but it is not stored in the database. We recommend using 2 in most cases to avoid increasing the size of the database unnecessarily. 1: The value is the default value, and it is stored in the database. 0: The value is not the default value. When the value type is something other than <code>option</code>, always use 0. If none of the values are set as the default value, the first value in the list is automatically the default value.

Picture properties

Property	In the example	Description
picture	picture	picture is used for adding images in user-defined attributes dialogs.
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
vertical offset	25	The vertical distance of the top edge of the image from the top edge of the dialog counted from the lower edge of the tab section

Value types in user-defined attributes

Value type	Description	Allowed values
angle	Angle (degrees)	Numbers that include a decimal point
area	Area (mm ²)	Numbers that include a decimal point

Value type	Description	Allowed values
areaperlength	Area per unit length (mm ² /m)	Numbers that include a decimal point
bolt_size	Bolt size	Numbers that include a decimal point
bolt_standard	Bolt standard	Text
date	Date with a small calendar	Dates consisting of day, month, and year.
date_time_min	Date and time in hours and minutes [12:00] with a small calendar	Dates consisting of day, month, and year, and times consisting of hours and minutes.
date_time_sec	Date and time in hours, minutes, and seconds [12:00:00] with a small calendar	Dates consisting of day, month, and year, and times consisting of hours, minutes, and seconds.
deformation	Deformation (mm)	Numbers that include a decimal point
density	Density (kg/m ³)	Numbers that include a decimal point
dimension	Dimension (mm)	Numbers that include a decimal point
distribload	Distributed load (N/m)	Numbers that include a decimal point
distribmoment	Distributed moment (Nm/m)	Numbers that include a decimal point
file_in	Input file	Text
file_out	Output file	Text
float	A number with a decimal point	Numbers that include a decimal point
force	Force (N)	Numbers that include a decimal point
integer	A whole number	Whole numbers
label	The label for the field	Text
material	Material type	Whole numbers that represent the material type: • 1: Steel • 2: Concrete • 5: Timber • 6: Miscellaneous

Value type	Description	Allowed values
modulus	Modulus (N/m ²)	Numbers that include a decimal point
moment	Moment (Nm)	Numbers that include a decimal point
momentofinertia	Moment of inertia (mm ⁴)	Numbers that include a decimal point
option	A drop-down list of options. Each option must be specified using the <code>value ("", 0)</code> property.	Text
profile	Profile	Text
radiusofinertia	Radius of inertia (mm)	Numbers that include a decimal point
ratio	Ratio	Numbers that include a decimal point
rotspringconstant	Rotation spring constant (Nm/rad)	Numbers that include a decimal point
sectionmodulus	Section modulus (mm ³)	Numbers that include a decimal point
springconstant	Spring constant (N/m)	Numbers that include a decimal point
strain	Strain	Numbers that include a decimal point
strength	Strength (N/m ²)	Numbers that include a decimal point
string	Text that is shown in the field. The value in the field is saved when the user clicks Apply or modified when the user clicks Modify .	Text The maximum length is 79 characters.
string_not_modifiable	Non-editable text that is shown in the field. When a field has the <code>string_not_modifiable</code> property, the field is always shown as dimmed. Users cannot change the value in the field. The value in the field is not saved when the user clicks Apply or modified when the user clicks Modify .	Text for which modification is prevented The maximum length is 79 characters.

Value type	Description	Allowed values
surfaceload	Surface load (N/m ²)	Numbers that include a decimal point
temperature	Temperature K (°C)	Numbers that include a decimal point
thermdilatcoefficient	Thermal dilation coefficient 1/K (1/°C)	Numbers that include a decimal point
torsionconstant	Torsion constant (mm ⁴)	Numbers that include a decimal point
warpingconstant	Warping constant (mm ⁶)	Numbers that include a decimal point
weight	Weight (kg)	Numbers that include a decimal point

Examples of value types in user-defined attributes

These examples show how to use some typical value types in user-defined attributes.

- **area**

```
unique_attribute("ADReinfArea", "", area, "%d", no, none, "0.0", "0.0",
260, 440, 120)
{
    value("", 0)
}
```

- **date**

```
unique_attribute("CHECKED_DATE", "j_CheckedDate", date, "%d", no, none,
"0.0", "0.0")
{
    value("", 0)
}
```

- **distance**

```
attribute("xs_shorten", "j_xs_shorten", distance, "%d", yes, none, "0.0",
"0.0")
{
    value("0.0", 0)
}
```

- **float**

```
attribute("PRODUCT_WEIGHT", "j_Product_weight", float, "%d", no, none,
"0.0", "0.0")
{
    value("", 0)
}
```

- **force**

```
unique_attribute("shear1", "", force, "%d", no, none, "0.0", "0.0", 260,
180, 120)
{
```

```

        value("-2147483648.0", 0)
    }

```

- integer

```

unique_attribute("NUMBERING_ORDER", "j_Numbering_Order", integer, "%d",
no, none, "0.0", "0.0")
{
    value("", 0)
}

```

- label

```

attribute("start", "j_AD_start_node", label, "%s", no, none, "0.0",
"0.0", 300, 20)

```

- moment

```

unique_attribute("moment2", "", moment, "%d", no, none, "0.0", "0.0",
460, 210, 120)
{
    value("-2147483648.0", 0)
}

```

- option

```

unique_attribute("OBJECT_LOCKED", "j_Locked", option, "%s", no,
none, "0.0", "0.0")
{
    value("", 2)
    value("j_No", 0)
    value("j_Yes", 0)
}

```

- string

```

attribute("comment", "j_comment", string, "%s", no, none, "0.0", "0.0")
{
    value("", 0)
}

```

Copy settings for part UDA

Some user-defined attributes, such as the model checking status, should not be copied when parts are copied. These attributes are called non-copy able and they are defined as "unique_attribute" in the object.inp file.

See the examples below. If the definition lines are added to the beam's attribute list in the object.inp, a new UDA text "Check status" is shown in the Beam (1) properties dialog. As a result, the value given in the Check status field is not copied when the beam is copied. Corresponding definition for a normal, copy able attribute is shown below for comparison.

An example of a non-copy able attribute:

```

unique_attribute("check_status", "Check status", string, "%s", no, none,
"0.0", "0.0")
{
    value("", 0)
}

```

An example of a normal, copyable attribute:

```

attribute("comment", "j_comment", string, "%s", yes, none, "0.0", "0.0")
{
    value("", 0)
}

```

About the tab_page property

The definition of the `tab_page` must be in the `part` section, and the sections for specific attributes, such as `column` or `beam`, must have only a reference to it.

```

/
*****
*/
/* 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)}

```

The maximum length for the tab name is 39 characters.

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.

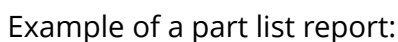
The ready-made textual and graphical templates are located under the environment folders, in ... \ProgramData\Trimble\Tekla Structures\<version>\environments\. The exact file location may vary depending on the folder structure of your environment files. Textual and graphical templates, except mark templates, 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 \(page 58\)](#).

Examples

Example of a title block:

No	REV MARK	REVISION DESCRIPTION	CREATED	APPROVED	REV. DATE
					
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:



For more information on using templates, see [Template Editor User's Guide \(page 184\)](#) or open the Template Editor Help in the Template Editor by clicking **Help --> Contents**.

See also

[Create a textual template \(page 184\)](#)

[Create a graphical template \(page 197\)](#)

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 \(page 181\)](#).

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 [Tekla Structures PDF documentation](#).

Create a textual template

Textual templates (.rpt) contain text only. They are primarily used for creating reports or listings of Tekla Structures specific objects, for example, material lists of construction assemblies.

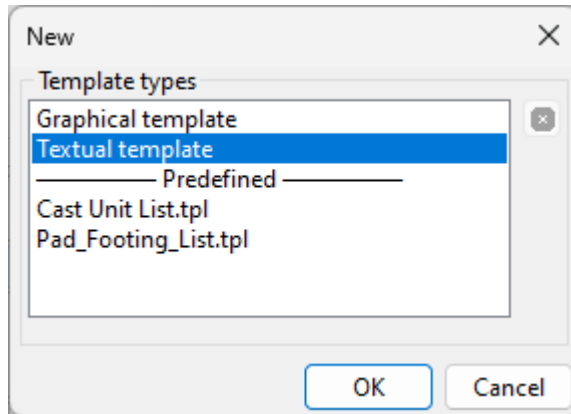
We will create a simple part list as an example of a textual template. First, we will add a page header with a report description and date information, then a row for the part list, and finally a page footer for summarizing the part data.

1. On the Tekla Structures **File** menu, click **Editors --> Template editor**. You can also [open Template Editor from the Windows Start menu](#).

2. In Template Editor, click **File --> New**.

Another way to create a new template is to open an existing template in Template Editor, modify the template as required, and save the template with another name.

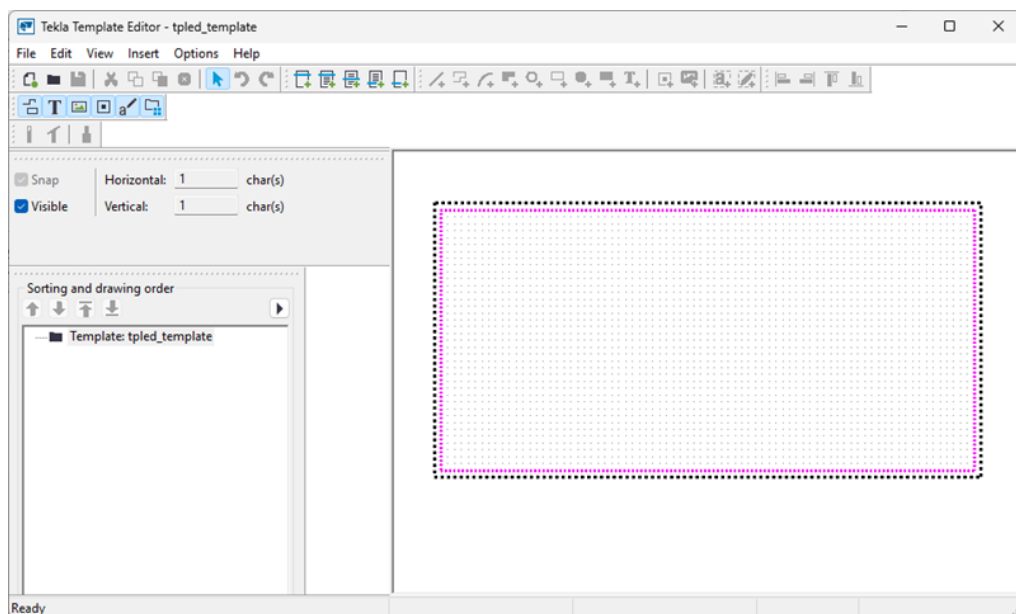
3. Select **Textual template**.



To create a new template based on a pre-defined template, select a file from the pre-defined templates section in the **Template types** dialog.

4. Click **OK**.

An empty template opens in the template work area, and you can start adding content. If you selected a pre-defined template, the work area contains the pre-defined content.

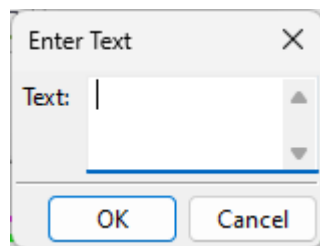


5. Set or modify the template page settings and margin settings:
 - a. Double-click the template to open the **Template Page Properties** dialog.
 - b. In the **Output**, **Workarea**, and **Margins** areas, modify the following:
 - **Width** and **Height**: Set the value in characters. The option to use page breaks if the page height is exceeded is selected by default. If this is not selected, no page breaks appear in the output.

You can also set the template height to match the drawing height using the **Dynamic height** checkbox

If you wish to use multiple columns in the template, define the width accordingly. For details on how to create a two-column template, see [How to create a double column template](#).

- **View height:** Set the page height in characters for template design. This does not affect the template output.
 - **Margins:** Set the margins for the left, right, and bottom of the template in characters.
- c. Click **OK** to save the changes.
 6. To add a page header row in the template, click **Insert --> Component --> Page header**.
 7. Add the necessary text labels to the page header.
 - a. Select the page header and click the **Text** button on the toolbar.
 - b. Type the needed text and click **OK**.



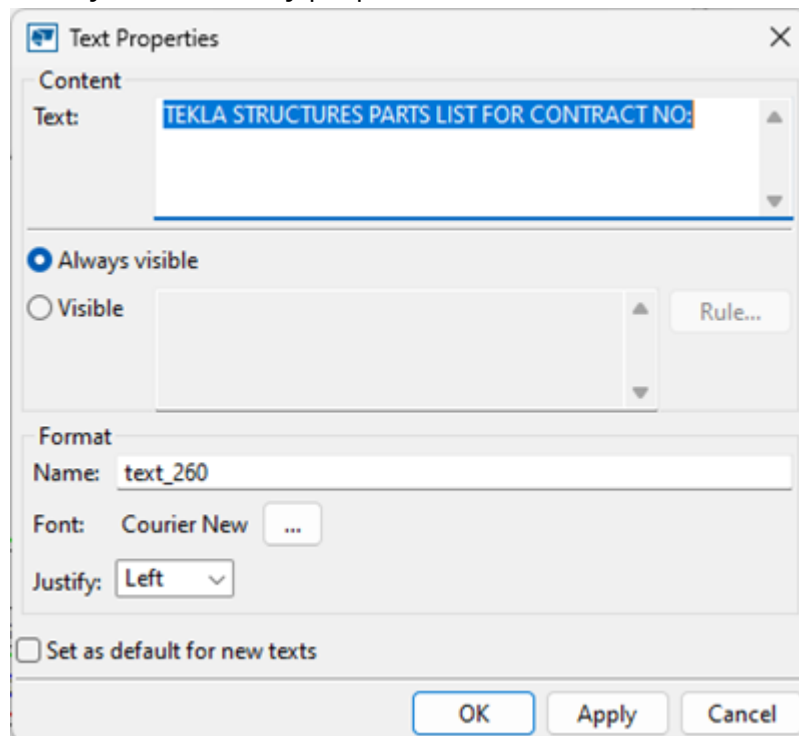
- c. Pick a location for the text in the page header.
- d. Add other text labels in the same way. For example, add a label for the report name, page number, and date, and column header labels for the part list that will be placed under the page header.

Here we have added some text labels to the header, including the column header labels for the part list:

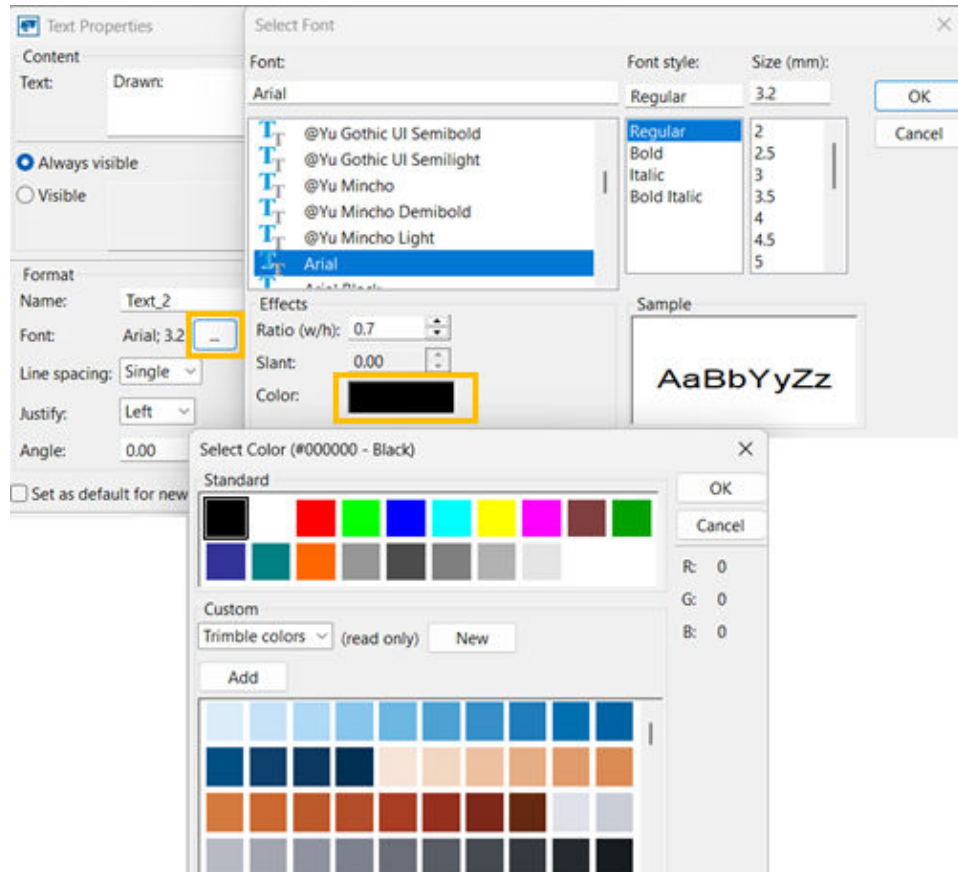
TEKLA STRUCTURES PARTS LIST FOR CONTRACT NO:						Page:
CONTRACT:						Date:
PartPos	Profile	No.	Material	Length	Area (m2)	Weight (kg)

8. Modify the text properties.
 - a. Double-click a text label in the page header.

- b. Modify the necessary properties.

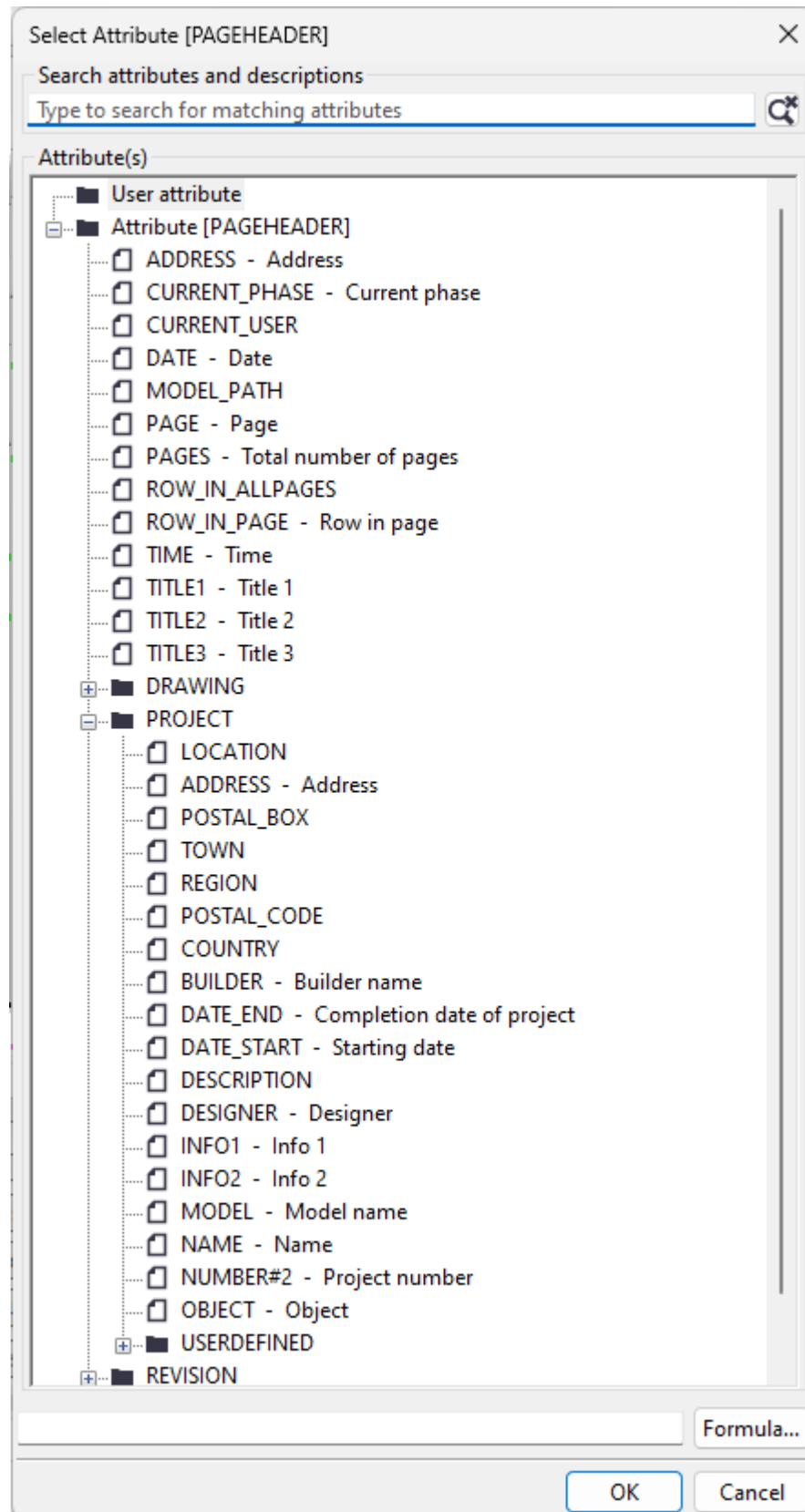


You can change the color of a text object. To do this, double-click a text object in the template, and in the object properties, click the  button next to the font setting. Then click the color box and select a standard color or a custom color.



- c. Click **OK**.
9. Add the necessary value fields to the page header. Value fields are there to pull information from the model and insert it into the report.
 - a. Select the page header, click **Insert --> ValueField** and pick a location for the value field in the header.

- b. Select an attribute to add in the value field from the list of available attributes.



- c. Click **OK**.
- d. Add other value fields in the same way.

We have added some value fields and attributes to the page header: PROJECT.NUMBER, PROJECT.NAME, PAGE, and DATE.

TEKLA STRUCTURES PARTS LIST FOR CONTRACT NO: 1212						
CONTRACT: NAME_PROJECT					Page: PA	Date: DATE
PartPos	Profile	No.	Material	Length	Area (m2)	Weight (kg)

10. Modify the value field properties.
 - a. Double-click a value field in the page header or in the content browser on the left.
 - b. Modify the value field properties.

Value Field Properties

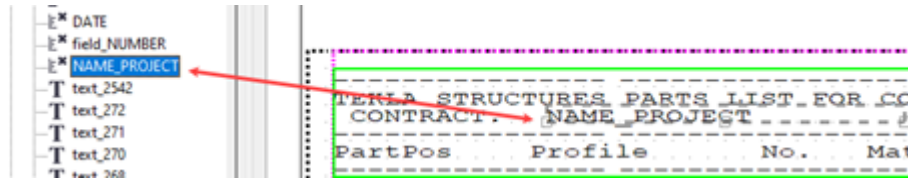
Content
Formula:

Format
Name:
Line count:
Data type:
Order:
When rows are combined:
☒ Don't sum values
☐ Sum values across all rows
☐ Sum values within one row
 Separator for unique items:
 Last separator:
 Sort list:
 Free attributes...

Layout
Font: Length: char(s)
 Justify: Align:
 Borders *

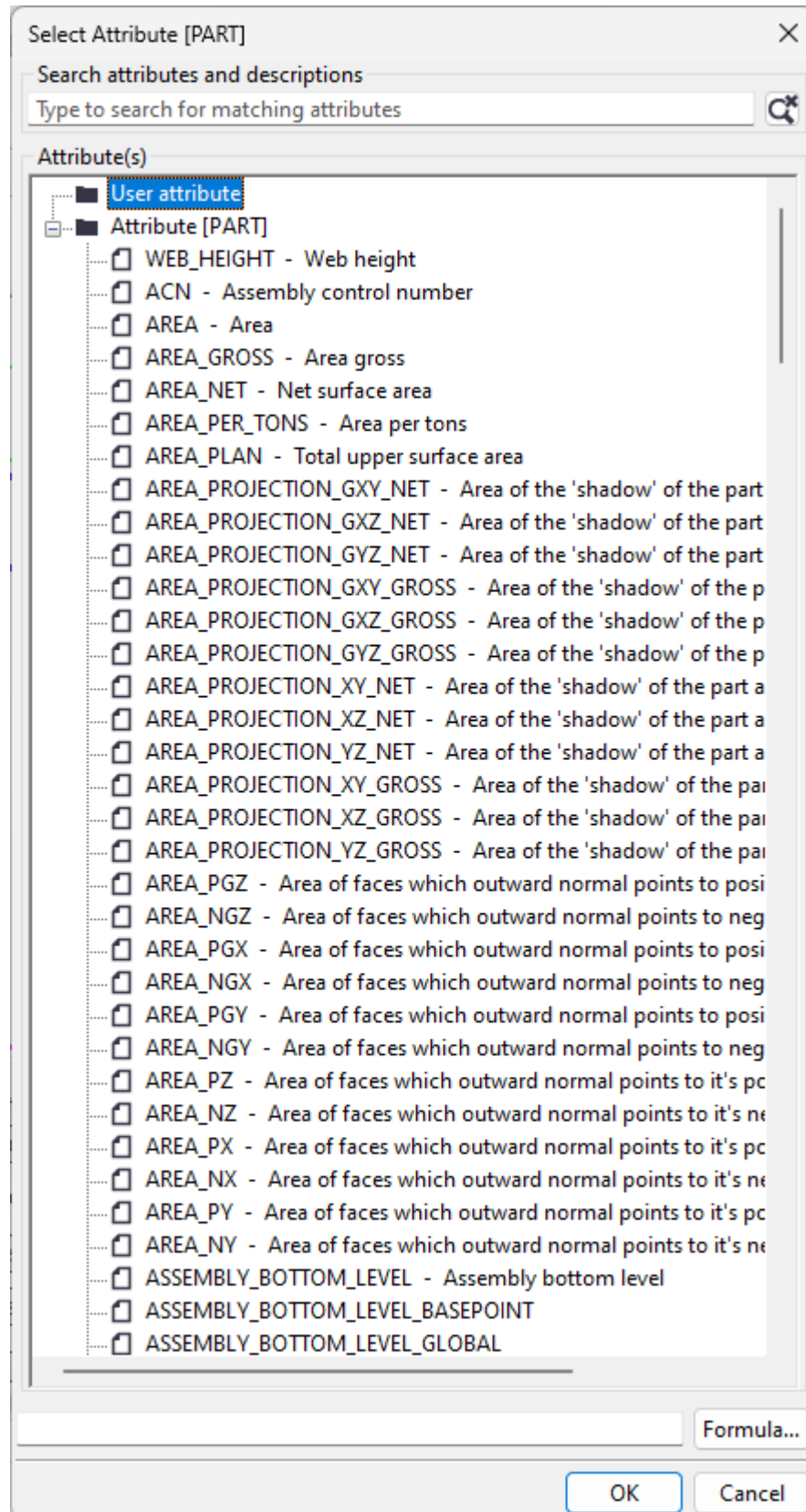
 * Applies to Excel export only
☐ Set as default for new value fields
 OK Apply Cancel

Pay attention to the content browser on the left while you are adding content to the template. It shows you the added content objects and allows you to quickly select and work with the content objects. When you select an object from the content browser, the object is also selected in the template.



11. Add new rows in the template.
 - a. Click **Insert --> Component --> Row**.
 - b. Select a [content type \(page 230\)](#) for the row, and click **OK**.
 The content type that you select affects the template attributes that you can add in the value fields. In this example, we will select PART.
12. Add value fields to get the required data from your Tekla Structures database.
 - a. Click **Insert --> Value field**.
 - b. Pick a location for the value field in the row.

The **Select Attribute** dialog is displayed.



- c. Select an attribute from the list and click **OK**.
- d. Add the rest of the needed value fields and attributes in the same way.

Here we have added the following template attributes to the row:
PART_POS, PROFILE, NUMBER, MATERIAL, LENGTH, AREA, and WEIGHT.

PART_PO	PROFILE	A NUMB	MATERI W	LENGTH	AREA f1	WEIGHT f1

13. To add a page footer row in the template, click **Insert --> Component --> Page footer**.
14. Add the necessary text labels and value fields to the page footer in the same way as you added to the header, and modify the properties if necessary.

We have added some text labels and value fields to the page footer:
NUMBER_TOTAL, AREA_TOTAL, and WEIGHT_TOTAL.

Total for [NUMB] members:	AREA_TOTA	WEIGHT_TO

15. Finalize the template.

When you have the desired content in the template, you can make the template look nicer by repositioning labels and value fields, cropping some rows, or adding lines to separate the rows. Cropping removes any unnecessary space from around the rows.

- To crop the page header row, part row, or page footer row, select the row, right-click, select **Crop**, and then select the desired crop option.
- Drag the text labels and value fields to reposition them if necessary.
- Add lines in the template between rows. In textual templates, you can use **Text** objects to add dashed lines (---) between the rows.

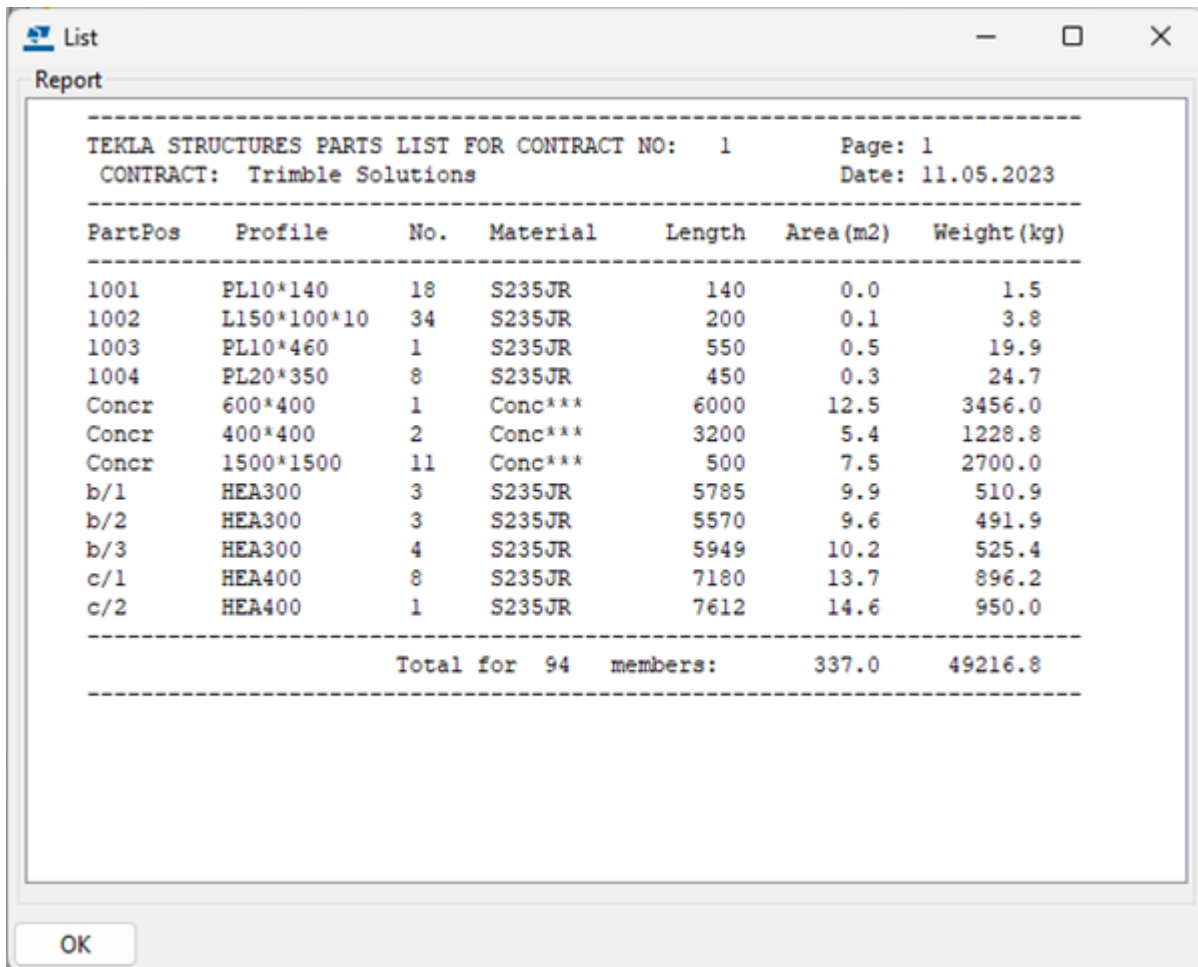
Here is the final template content:

TEKLA STRUCTURES PARTS LIST FOR CONTRACT NO: [f1el]						Page: [PA]
CONTRACT: NAME_PROJECT						Date: [DATE]
PartPos	Profile	No.	Material	Length	Area (m2)	Weight (kg)
PART_PO	PROFILE	A NUMB	MATERI W	LENGTH	AREA f1	WEIGHT f1
Total for [NUMB] members:						AREA_TOTA WEIGHT_TO

16. Save the template.
 - a. Click **File --> Save as**.
 - b. By default, the new and edited textual templates are saved in the model folder. If you want to use the template in other projects as well, save the template in the template folder defined for the advanced option XS_FIRM or XS_PROJECT.
 - c. In the **File name** field, enter a name for the template.

d. Click **OK**.

Here is an example of the part list report.



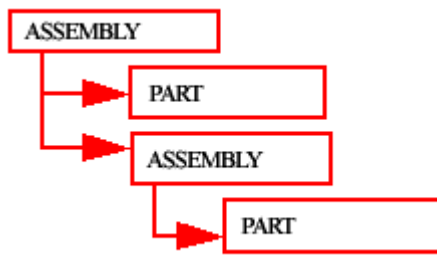
PartPos	Profile	No.	Material	Length	Area(m2)	Weight(kg)
1001	PL10*140	18	S235JR	140	0.0	1.5
1002	L150*100*10	34	S235JR	200	0.1	3.8
1003	PL10*460	1	S235JR	550	0.5	19.9
1004	PL20*350	8	S235JR	450	0.3	24.7
Concr	600*400	1	Conc***	6000	12.5	3456.0
Concr	400*400	2	Conc***	3200	5.4	1228.8
Concr	1500*1500	11	Conc***	500	7.5	2700.0
b/1	HEA300	3	S235JR	5785	9.9	510.9
b/2	HEA300	3	S235JR	5570	9.6	491.9
b/3	HEA300	4	S235JR	5949	10.2	525.4
c/1	HEA400	8	S235JR	7180	13.7	896.2
c/2	HEA400	1	S235JR	7612	14.6	950.0
Total for 94 members:					337.0	49216.8

TIP You can also create Excel (.xlsx) reports in Tekla Structures. The content and formatting of these reports is defined using a textual .xlsx.rpt template created with Template Editor, and an .xlsx template created with Microsoft Excel. .

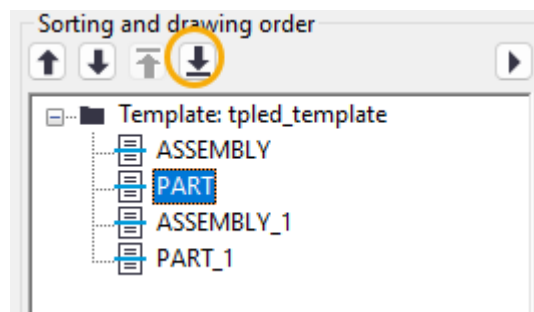
Example: Create a template for nested assemblies

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

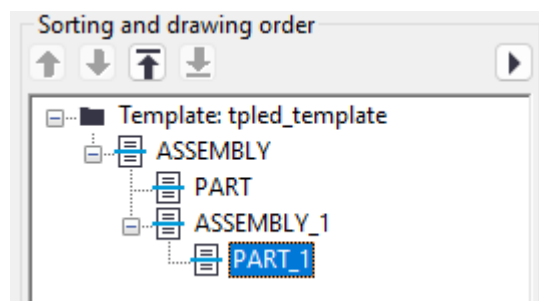
These steps show how to create a nested assembly structure in a textual template similar to the one in this picture:



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 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:

ASSEMBLY STRUCTURE		
AssemblyRo	NUMBE	WEIGHT1
PartRow1	NUMBE	WEIGHT2
SubAssembl	NUMBE	WEIGHT3
PartRow2	NUMBE	WEIGHT4
TOTAL WEIGHT		TotalWeight

Assembly structure

TOP/1	1	677.5
SUBTRUSS/5	2	338.7
1001	2	3.6
1002	2	3.4
T/2	2	10.3
T/3	2	12.5
T/4	2	14.8
T/6	2	12.2
T/7	2	14.5
T/8	2	17.0
T/9	2	16.3
T/10	2	9.3
T/11	2	11.9
T/12	2	14.5
T/15	2	73.1
T/16	4	62.7
Total weight		677.5

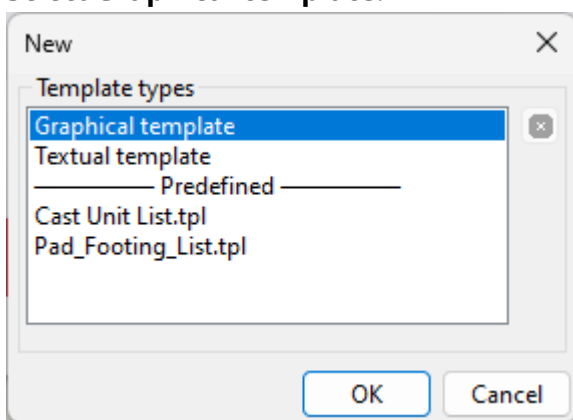
NOTE You can create graphical templates for nested assemblies in the same manner as textual templates. The difference between graphical and textual templates is that in a graphical template you can show project and company information and graphics, such as table outlines, pictures, or symbols.

Create a graphical template

You can insert graphical templates (.tpl) in drawing layouts as tables, text blocks, or drawing headers, for example. You can also add graphical templates as elements in marks and associative notes.

We will create a drawing title block as an example of a graphical template. The title block contains drawing details such as the title, author name, scale, and date the drawing was created.

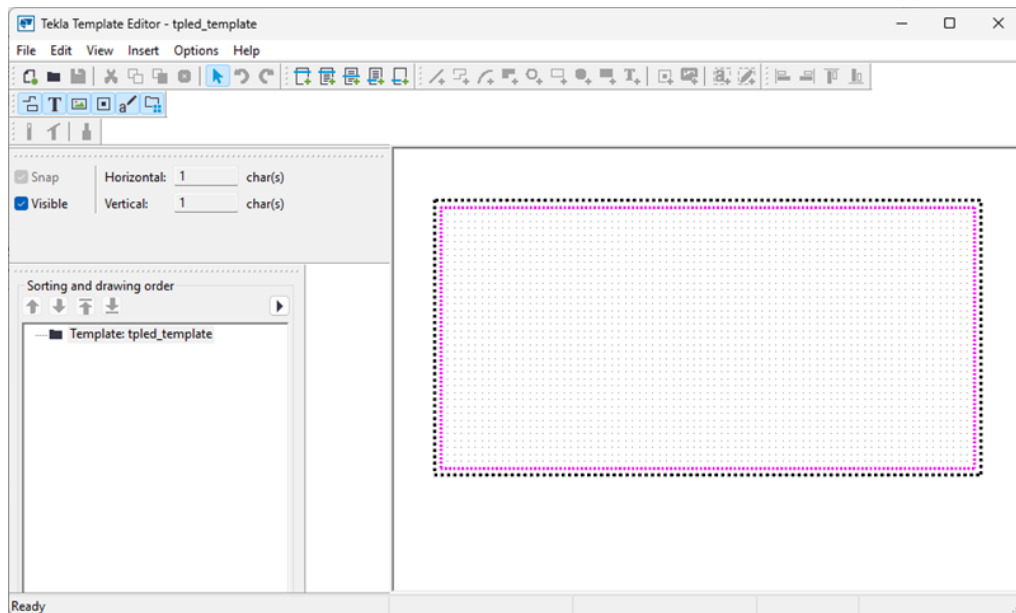
1. On the Tekla Structures **File** menu, click **Editors --> Template editor**. You can also [open Template Editor from the Windows Start menu](#).
2. In Template Editor, click **File --> New**.
3. Select **Graphical template**.



To create a new template based on a pre-defined template, select a file from the pre-defined templates section in the **Template types** dialog.

4. Click **OK**.

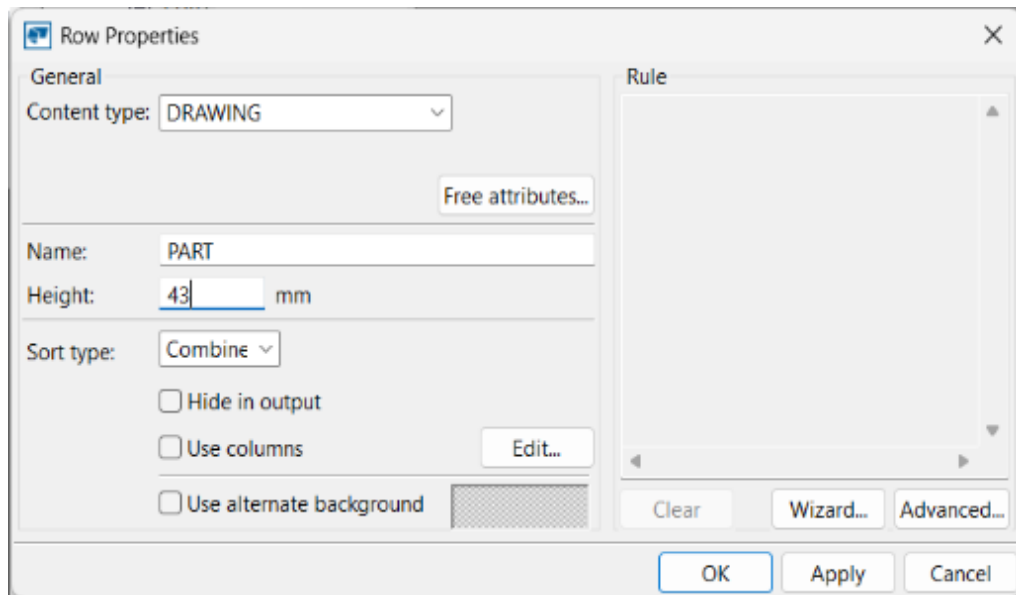
An empty template opens in the template work area, and you can start adding content. If you selected a pre-defined template, the work area contains pre-defined content.



5. Set or modify the template page settings and margin settings:
 - a. Double-click the template to open the **Template Page Properties** dialog.
 - b. In the **Output**, **Workarea**, and **Margins** areas, modify the following:
 - **Width** and **Height**: Set in graphical units. The option to use page breaks if the page height is exceeded is selected by default. If this is not selected, no page breaks appear in the output.
If you wish to use multiple columns in the template, define the width accordingly. For details on how to create a two-column template, see [How to create a double column template](#).
 - **View height**: Set the page height for template design, but does not affect template output.
 - **Margins**: Set the margins for the left, right and bottom of the template in graphical units.
 - **Use font CAP height**: Set how the font size is calculated and output in graphical templates. It means that the text size will output exactly as defined. See [Control font height in graphical templates \(page 207\)](#) for more information.
 - c. Click **OK** to save the changes.
6. Add a row in the template for the drawing title block.
 - a. Click **Insert --> Component --> Row**.

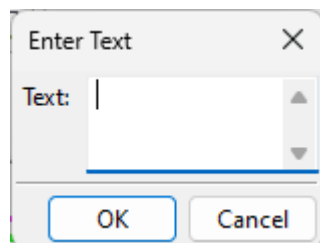
- b. Select the [content type \(page 230\)](#) for the row, and click **OK**.

The content type that you select affects the template attributes that you can add in the value fields. In this example, DRAWING is selected.



The 'Row Properties' dialog box is shown with the 'General' tab selected. The 'Content type' dropdown is set to 'DRAWING'. Below it is a 'Free attributes...' button. The 'Name' field contains 'PART'. The 'Height' field contains '43' with 'mm' as a unit. The 'Sort type' dropdown is set to 'Combine'. There are three checkboxes: 'Hide in output' (unchecked), 'Use columns' (unchecked), and 'Use alternate background' (unchecked). An 'Edit...' button is next to the 'Use alternate background' checkbox. On the right, there is a 'Rule' section with a large empty text area and buttons for 'Clear', 'Wizard...', and 'Advanced...'. At the bottom are 'OK', 'Apply', and 'Cancel' buttons.

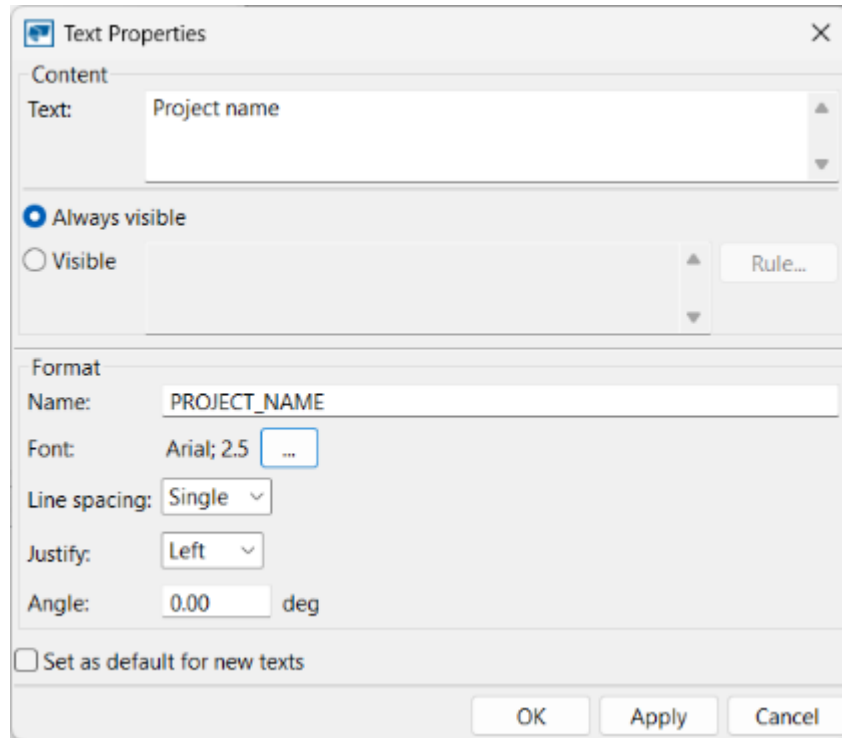
7. Add the needed text labels to the row.
- a. Select the row and click **Insert --> Text**.
- b. Type the needed text and click **OK**.



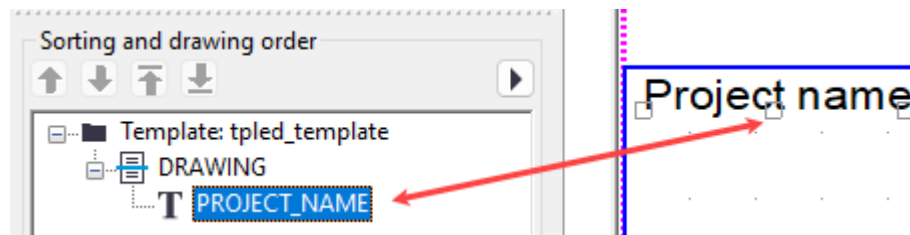
The 'Enter Text' dialog box is shown with a 'Text' field containing a cursor. There are 'OK' and 'Cancel' buttons at the bottom.

- c. Pick a location for the text in the row.
- d. To modify the text properties, double-click the text, adjust the properties, and click **OK**.

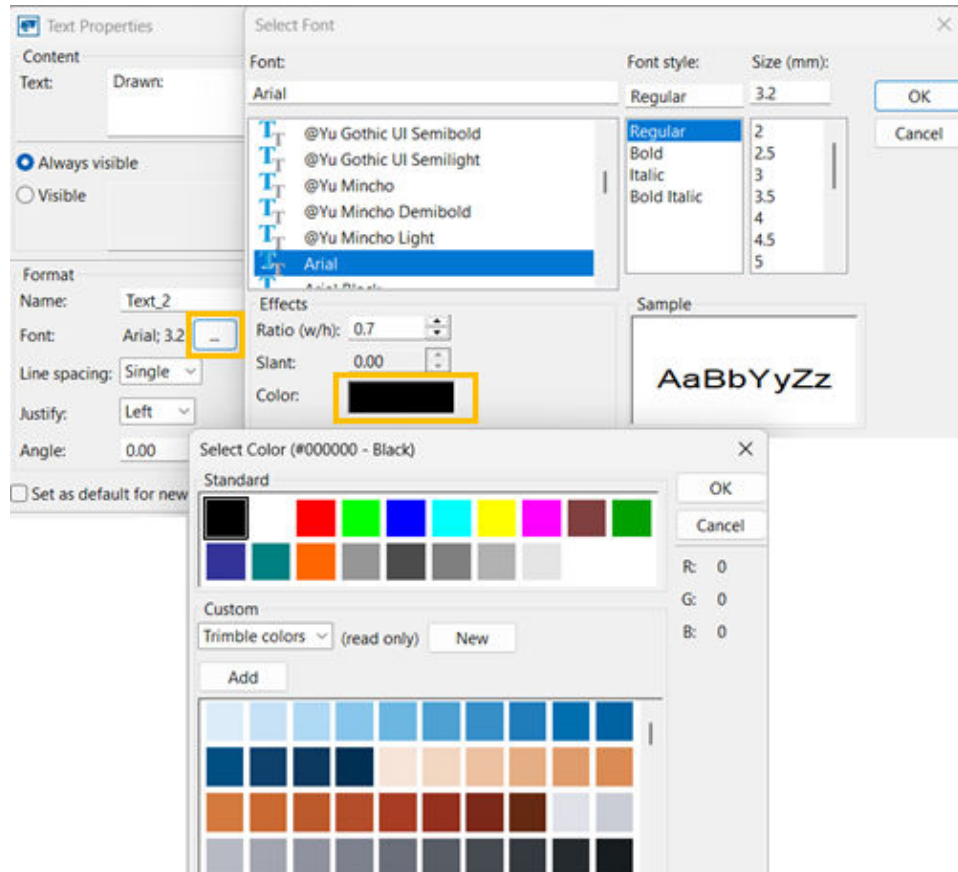
For example, enter a name for the text object and change the font size. The name will be shown in the content browser.



Pay attention to the content browser on the left while you are adding content to the template. It shows you the added content objects and allows you to quickly select and work with the content objects. When you select an object from the content browser, the object is also selected in the template.



You can change the color of a text object. To do this, double-click a text object in the template, and in the object properties, click the  button next to the font setting. Then click the color box and select a custom color.

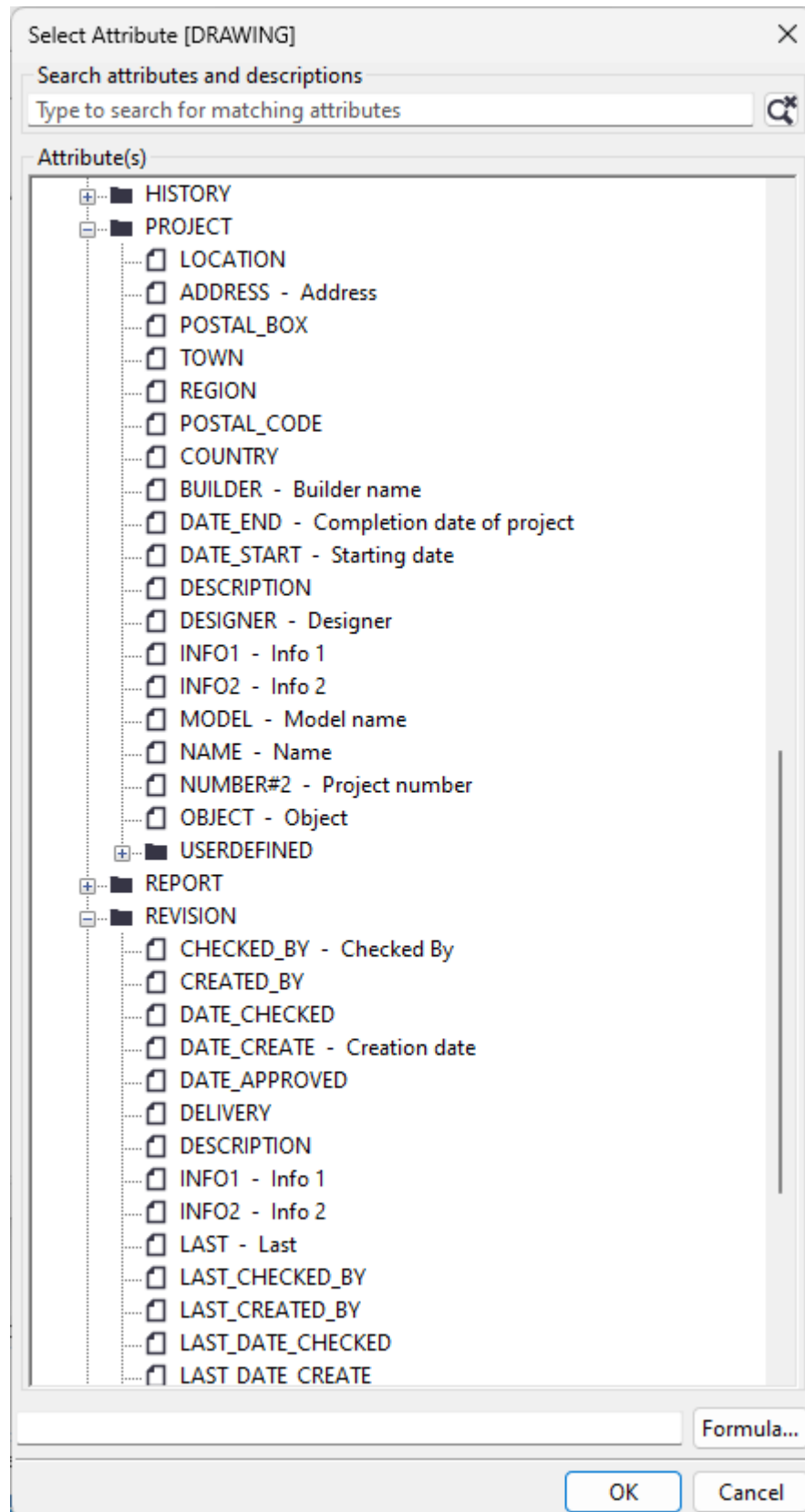


- e. Add the rest of the text labels to the row in the same way.



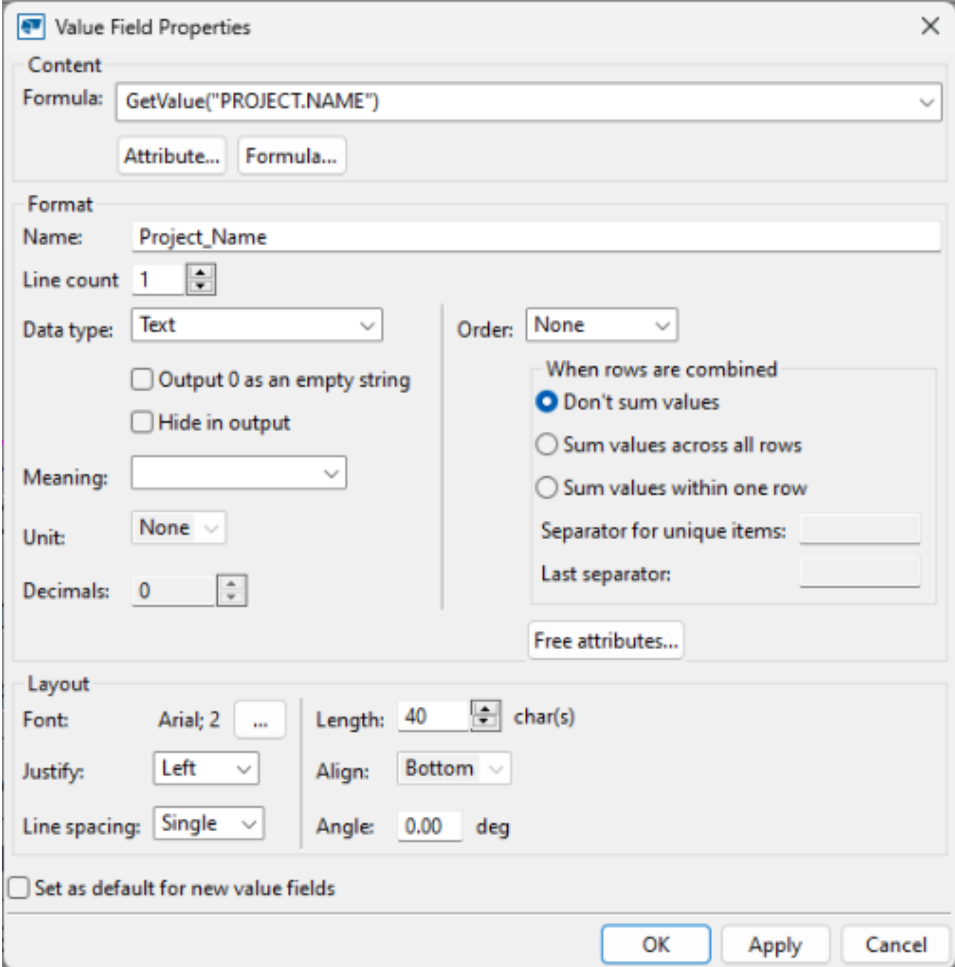
8. Add the necessary value fields to the row.
- Select the row, click **Insert** --> **ValueField** and pick a location for the value field in the row.

- b. Select an attribute to add in the value field from the list of available attributes and click **OK**.



In this example, we select NAME under PROJECT.

- c. Add other value fields in the same way.
- d. To modify the value field properties, double-click the value field. For example, change the value field name, font size, and allowed text length. The value field name will be shown in the content browser and in the template.



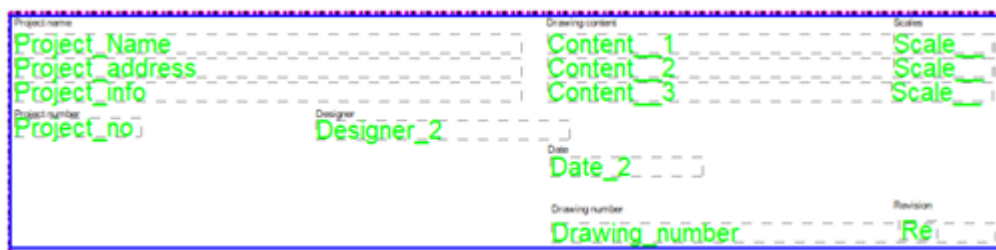
The 'Value Field Properties' dialog box is shown with the following settings:

- Content:** Formula: `GetValue("PROJECT.NAME")`
- Format:**
 - Name: `Project_Name`
 - Line count: `1`
 - Data type: `Text`
 - Order: `None`
 - ☐ Output 0 as an empty string
 - ☐ Hide in output
 - Meaning: (empty)
 - Unit: `None`
 - Decimals: `0`
 - When rows are combined: ☒ Don't sum values, ☐ Sum values across all rows, ☐ Sum values within one row
 - Separator for unique items: (empty)
 - Last separator: (empty)
- Layout:**
 - Font: `Arial; 2`
 - Length: `40` char(s)
 - Justify: `Left`
 - Align: `Bottom`
 - Line spacing: `Single`
 - Angle: `0.00` deg
- ☐ Set as default for new value fields

Buttons: OK, Apply, Cancel

- e. Click **OK**.

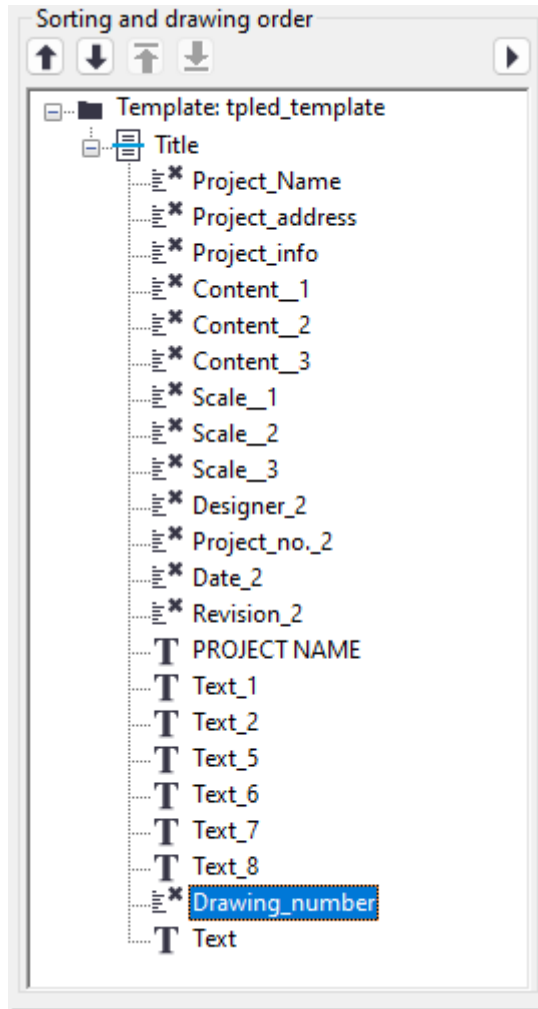
Here we have added the needed value fields to the row and modified the value field properties:



The content browser shows the following content:

- Project name: `Project_Name`
- Project address: `Project_address`
- Project info: `Project_info`
- Project number: `Project_no`
- Designer: `Designer_2`
- Date: `Date_2`
- Drawing number: `Drawing_number`
- Revision: `Re`
- Content_1: `Content_1`
- Content_2: `Content_2`
- Content_3: `Content_3`
- Scale: `Scale`
- Scale: `Scale`
- Scale: `Scale`

The content browser shows the added content:



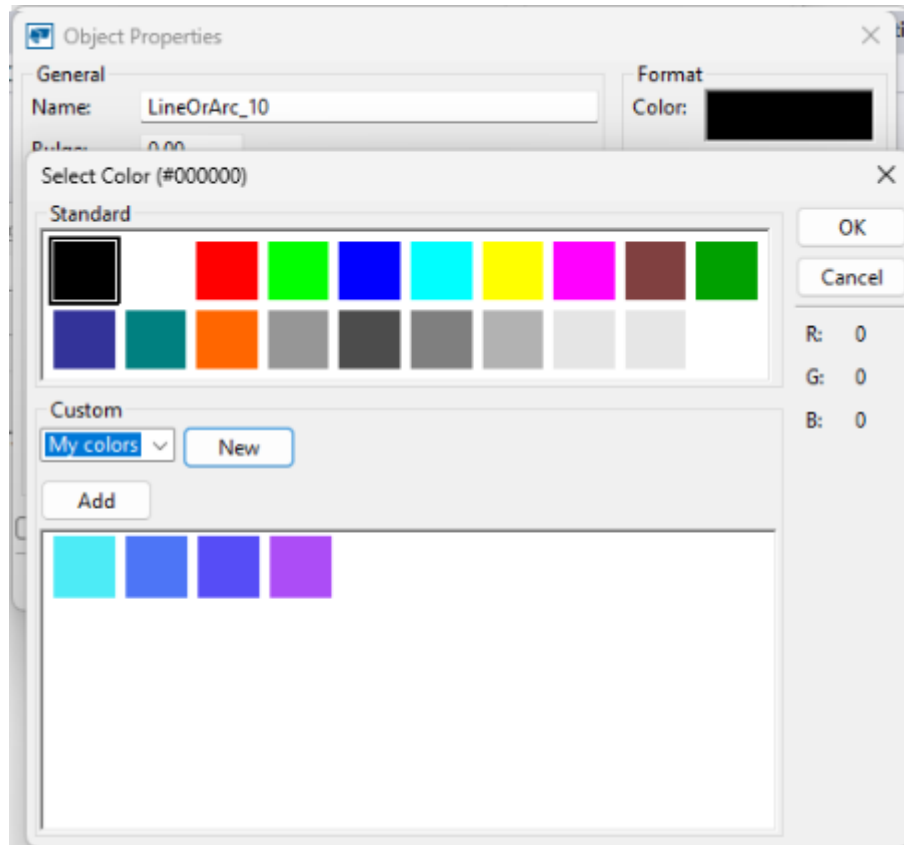
9. Finalize the template.

When you have the desired content in the template, you can make the template look nicer by repositioning labels and value fields, cropping the rows, or adding lines to separate the columns and rows. Cropping removes any unnecessary space from around the rows.

- To crop the row, select the row, right-click, select **Crop**, and then select the desired crop option.
- Drag the text labels and value fields to reposition them if necessary.
- Draw lines in the template between columns and rows by using the graphical tools. You can double-click the created objects to change the color and other properties.



You can change the color of a shape object. To do this, double-click a shape object, such as a line, and in the object properties, click the color box and select a standard color or a custom color.



Here is the final template content:

Project Name		Content_1	Scale
Project address		Content_2	Scale
Project info		Content_3	Scale
Project number	Designer_2		
Project_no		Date_2	
		Drawing number	Revision
		Drawing_number	Re

10. Save the template.
 - a. Click **File** --> **Save as** .
 - b. By default, the new and edited templates are saved in the \templates folder under the current model folder. If you want to use the template in other projects as well, save the template in the template folder defined for the advanced option XS_FIRM or XS_PROJECT.
 - c. In the **File name** field, enter a name for the template.
 - d. Click **OK**.

Here is an example of the created title block in a drawing:

Project name Best house House street 1		Drawing content Footings		Scale 1:50
Project number 1	Designer Dean Designer			
		Date 20.09.2022		
		Drawing number GA-drawing	Revision F2	

Other ways to create new graphical templates

- **Use existing templates:** Another way to create a new template is to open an existing template in Template Editor, modify the template as required, and save the template with another name.
- **Import DWG files:** You can also import DWG files in graphical templates and use those as title blocks, for example. For more information, click the links below:

["Import DWG into Template Editor to create custom Title blocks"](#)

[Template from drawing \(DWG/DXF\) - best practices.](#)

[DWG logo looks bad in Template Editor](#)

Control font height metric in graphical templates

You can use CAP height as the font height metric in Tekla Structures drawings and have more control over the font height in drawing-related content like printing and exports. You can also apply the CAP font height in graphical templates.

Traditionally, the height of the text in Tekla Structures drawings has been based on em (point size) font height metric only. However, some projects require the height of the text to be determined using another industry

standard, CAP font height. CAP height represents the height of a capital letter more accurately than em height.



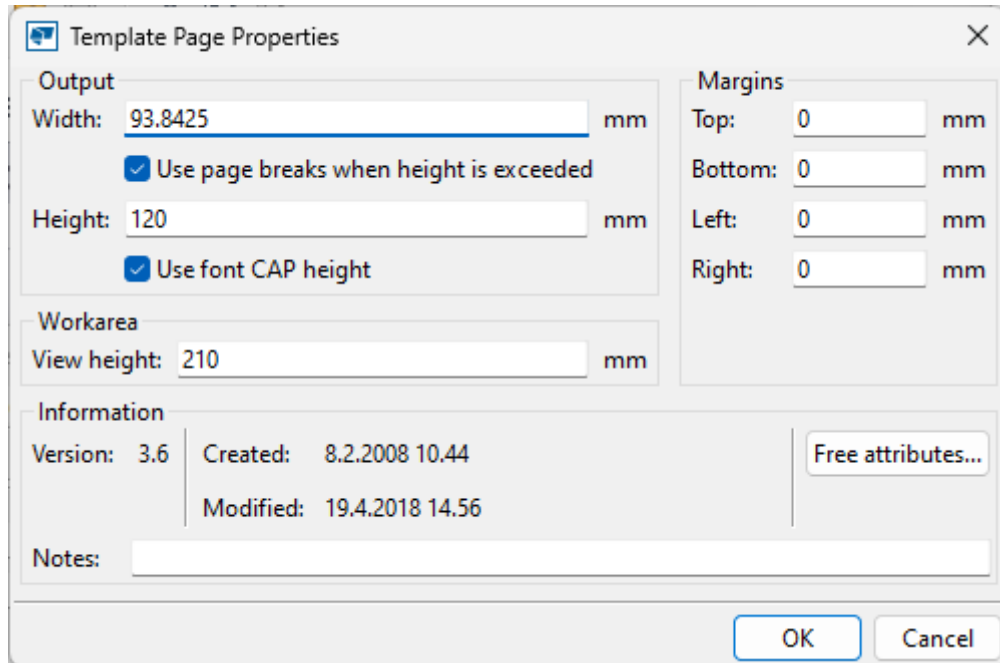
(1) CAP height

(2) point size (em)

You can control the font height in drawings with the advanced option `XS_DRAWINGS_USE_CAP_HEIGHT_FOR_FONT_HEIGHT`. CAP height is used when this advanced option is set to `TRUE`, whereas em (point size) height is used when this advanced option is set to `FALSE` (default value).

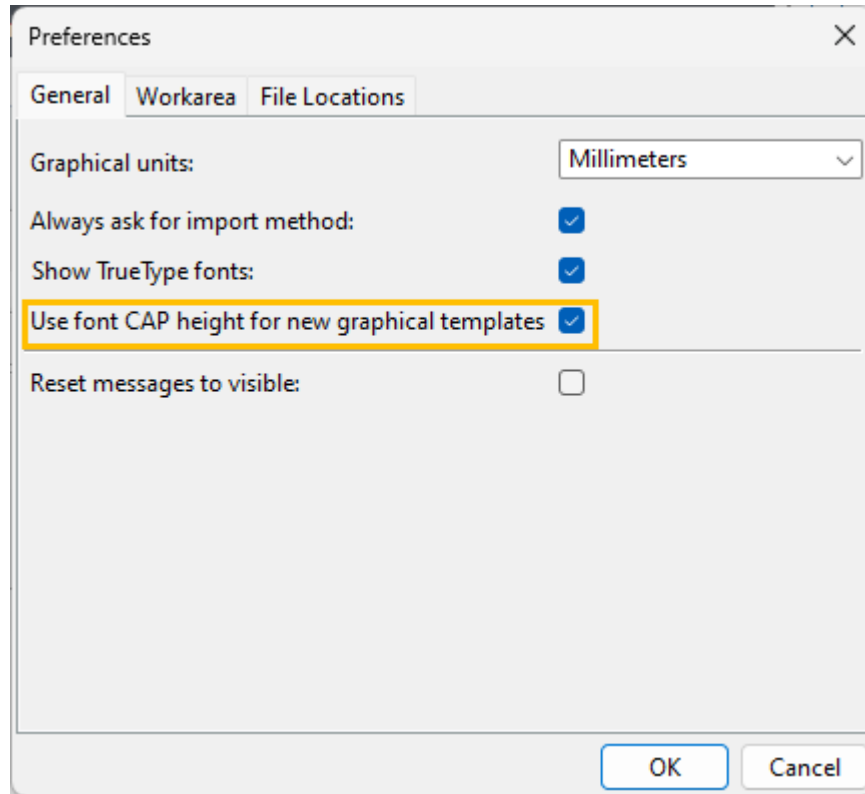
The font metric change is not automatically applied to the existing templates. Texts in drawings created by the drawing templates in Template Editor are not directly affected by the `XS_DRAWINGS_USE_CAP_HEIGHT_FOR_FONT_HEIGHT` advanced option. The reason for this is that the change in the font height might cause overlapping in the template fields.

- If you want to use CAP height in a specific drawing template, you need to select the **Use font CAP height** option in the template page properties of the particular template and then adjust the template content as necessary to correct any overlapping fields.



- When you create a new drawing template, the preselection of the **Use font CAP height** option depends on how you have started Template Editor:
 - If you have started Template Editor from within Tekla Structures from the **File** menu or when editing a drawing layout, Template Editor follows the `XS_DRAWINGS_USE_CAP_HEIGHT_FOR_FONT_HEIGHT` setting.
 - If you have started Template Editor from outside Tekla Structures from the Microsoft Windows **Start** menu, the option is controlled by the

Template Editor preferences, and whether you have selected the **User font CAP height for new graphical templates** checkbox:



Create a template in HTML format

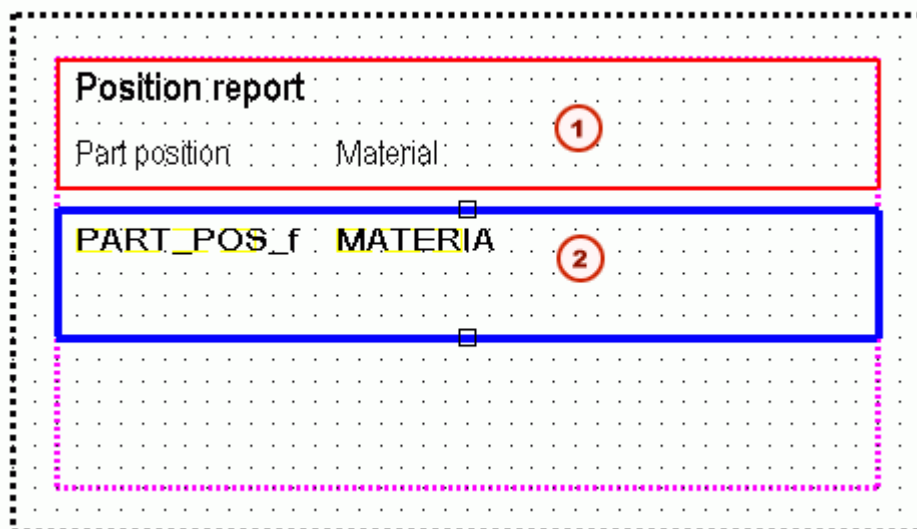
Templates in the HTML format give you more possibilities for different layout, fonts, and images. Templates that generate output in HTML format are graphical and have the file name extension `.html.rpt`.

NOTE If you [add images to your HTML template \(page 227\)](#), 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 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. Save the template in the model folder. If you want to use the template in other projects as well, save the template in the template folder defined for the advanced option `XS_FIRM` or `XS_PROJECT`.
 - 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

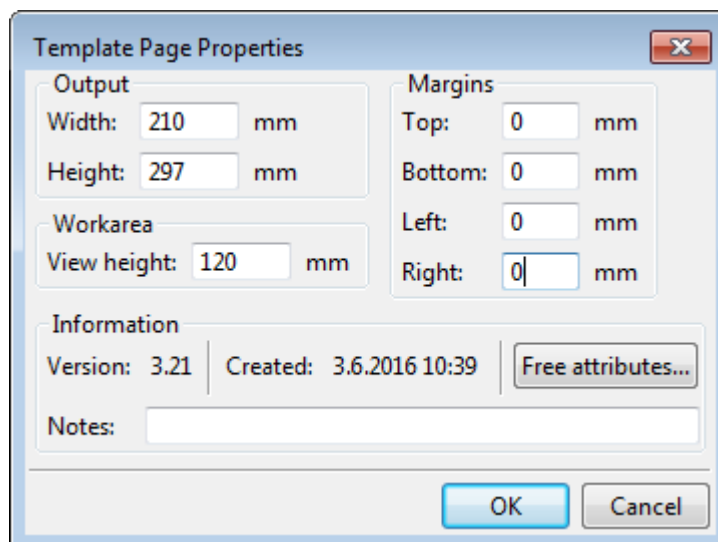
2. Row that contains two value fields

- TIP** • To export reports to Microsoft Excel with a certain layout, for example, merged cells, border lines, font types and sizes, you can use HTML in Template editor. When you save the template with the file name extension `.xls.rpt`, the Excel report will automatically open in Excel when **Show report** is set to **With associated viewer**. For more information, see [How to make basic HTML-based excel reports](#).
- To create an additional set of pictures to the report folder, set the advanced option `XS_CREATE_ALSO_BIG_HTML_REPORT_PICTURES` to `TRUE`. The pictures are three times larger in size compared to the ones in the HTML report.

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, 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 graphical template \(page 197\)](#).
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](#).

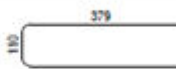
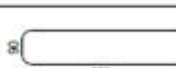
Example .pdf report

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		W/4
WR/3	16	8	Undefined	7130	11.25	90.0		
WR/4	12	8	Undefined	3490	3.10	24.8		
WR/6	16	4	Undefined	7690	12.14	48.5		
WR/7	12	4	Undefined	4090	3.63	14.5		
WR/11	10	8	Undefined	950	0.59	4.7		W/3
WR/12	10	12	Undefined	2080	1.28	15.4		
WR/13	10	12	Undefined	2880	1.78	21.3		
WR/2	8	42	Undefined	830	0.33	13.8		W/3
WR/2	8	96	Undefined	830	0.33	31.5		W/4
WR/5	12	24	Undefined	980	0.87	20.9		
WR/8	6	14	Undefined	830	0.18	2.6		W/3
WR/9	6	22	Undefined	810	0.18	4.0		W/3
WR/10	8	78	Undefined	810	0.32	25.0		W/3
WR/10	8	184	Undefined	810	0.32	58.9		W/4
Total:				532.0	Total:		383.7	

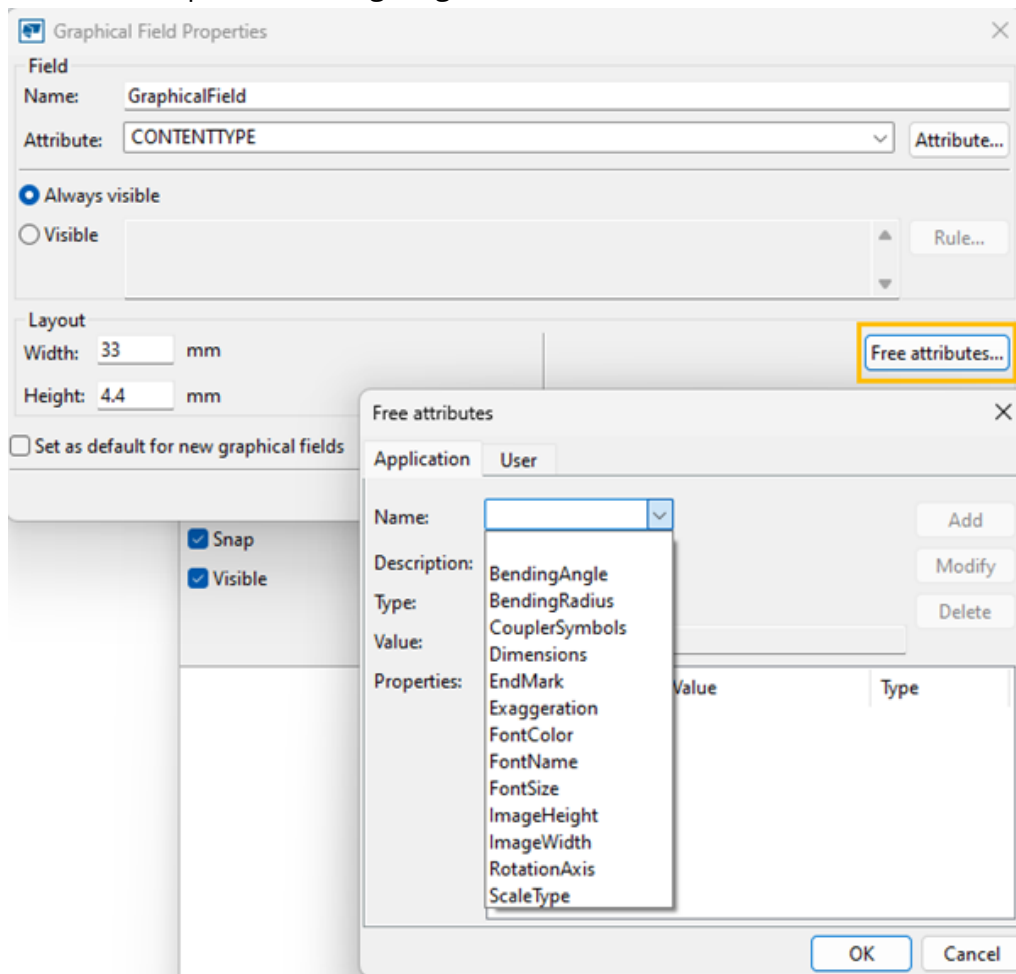
Create a template for bending schedules or pull-out pictures

You can use the Template Editor to create bending schedules or pull-out 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 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.
9. Click **Free attributes** and go to the **Application** tab.

10. Select the required bending diagram attributes.

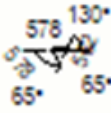
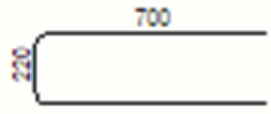
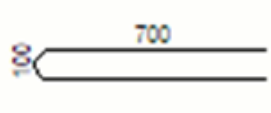
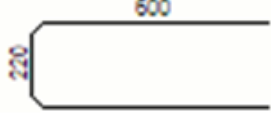
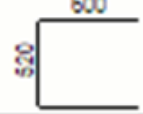
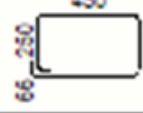
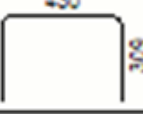
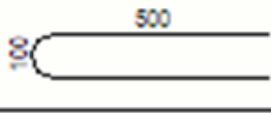
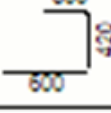


You can also define the bending diagram attributes on the **User** tab. Note that if the same attribute is set both as **User** attribute and **Application** attribute, the **Application** attribute takes precedence.

For a list of attributes and values that can be used for bending schedules in templates, see "Bending schedule attributes" below.

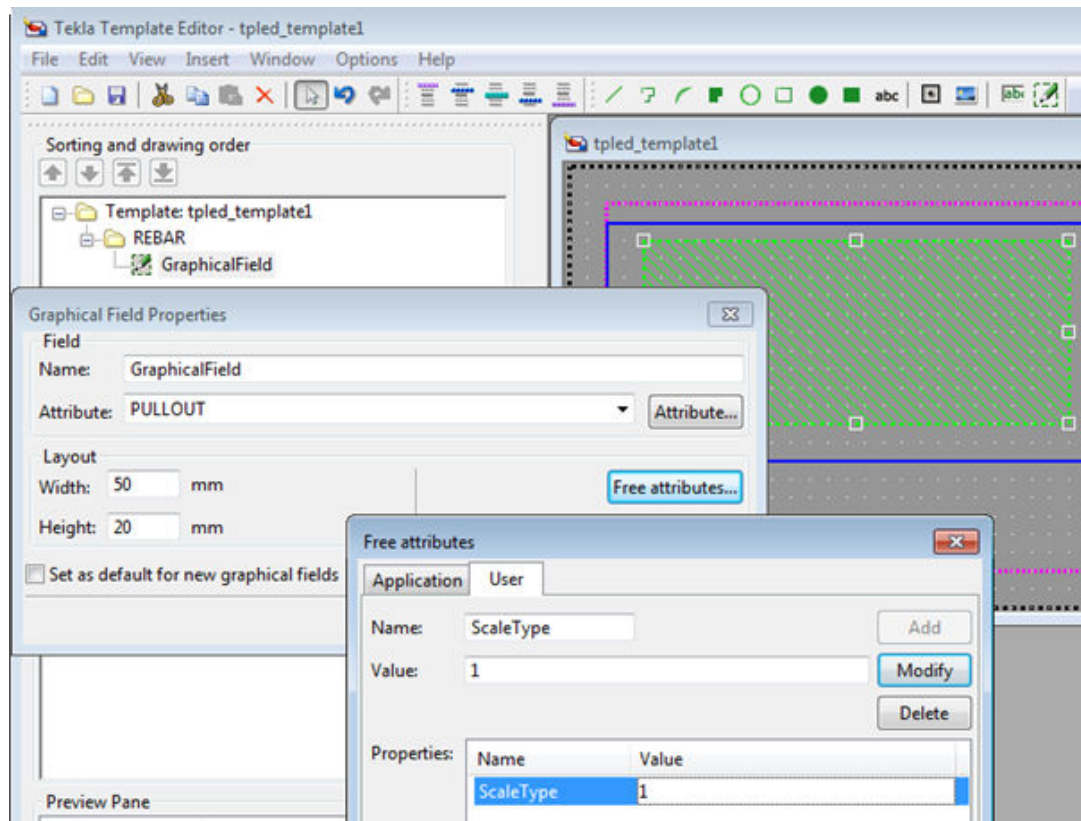
11. Save the template.

Example

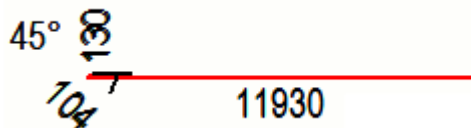
REBAR BENDING SCHEDULE							
Pos	Diameter	Number	Grade	Length	Kg/p	Weight	Bending shape
R/19	12	6	Unde***	10680	9.48	56.9	10685
R/189	20	2	Unde***	10680	26.34	52.7	10685
98	16	2	Unde***	2230	3.52	7.0	
R/10	12	4	Unde***	1560	1.39	5.5	
R/11	12	4	Unde***	1430	1.27	5.1	
R/15	12	4	Unde***	1360	1.21	4.8	
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

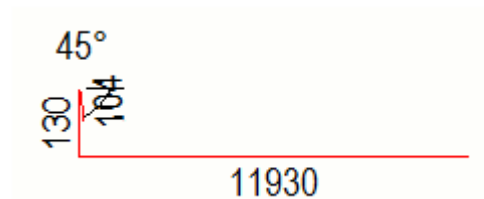
There is a free attribute available for the `PULLOUT` attribute in graphical templates that you can use to define the scale type. If you set the free attribute `ScaleType` to 1 on the **User** tab in the **Free attributes** dialog, the pull-out pictures will be scaled to fit the available space in both 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.

Create a title block from a DWG file

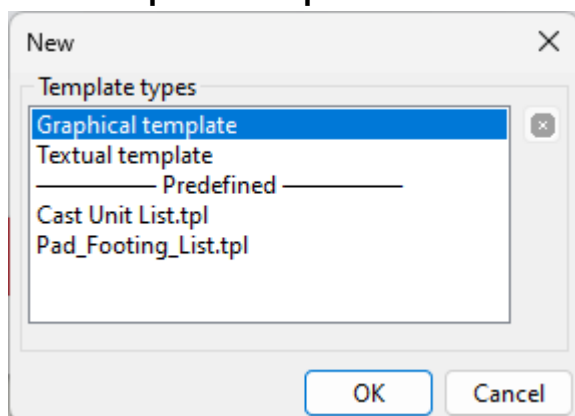
You can import a DWG title block in Tekla Structures drawing template. This way you do not need to redraw everything inside Template Editor.

Before importing a DWG title block

- In the CAD software, ensure that the linework is in model space and not in paper space. Tekla Structures does not read information from paper space sheets.
- You might need to save the title block CAD file in an older DWG format, preferably AutoCAD2000, which removes proxy graphics and is compatible with most Tekla Structures versions.
- Move the title block to 0,0,0 coordinate.
- Clean up the DWG file in the CAD software so that you only have the title block in the file, nothing else. Also remove all texts that you do not need in the title block.
- You might need to clean extra data from the DWG file in the CAD software (try WBLOCK, PURGE, or FLATTEN without hiding objects).

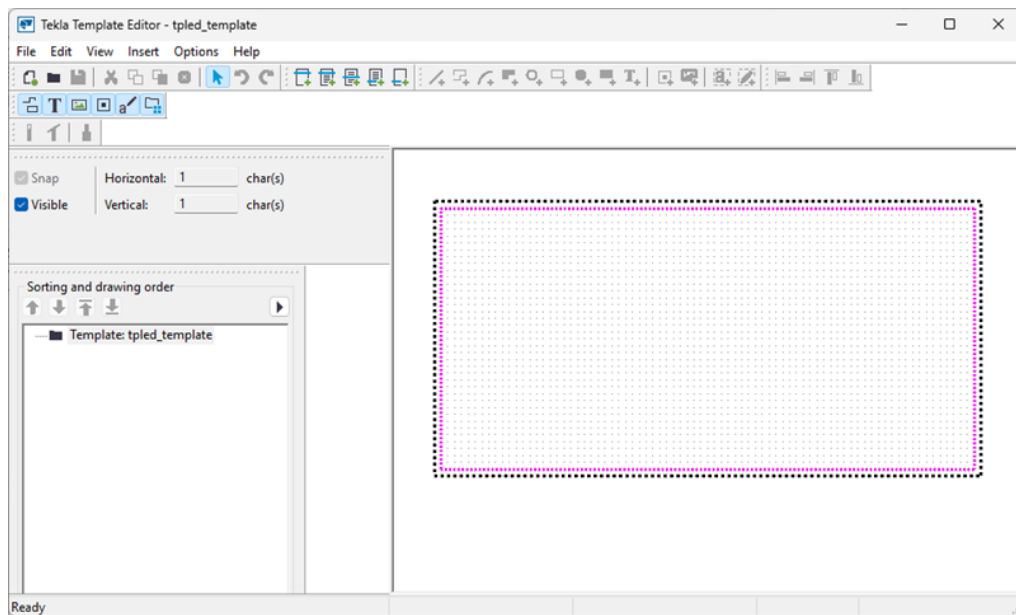
Import and modify a DWG title block

1. To open Template Editor, in Tekla Structures, go to **File** menu and select **Editors --> Template editor**.
2. In Template Editor, click **File --> New**.
3. Select **Graphical template**.



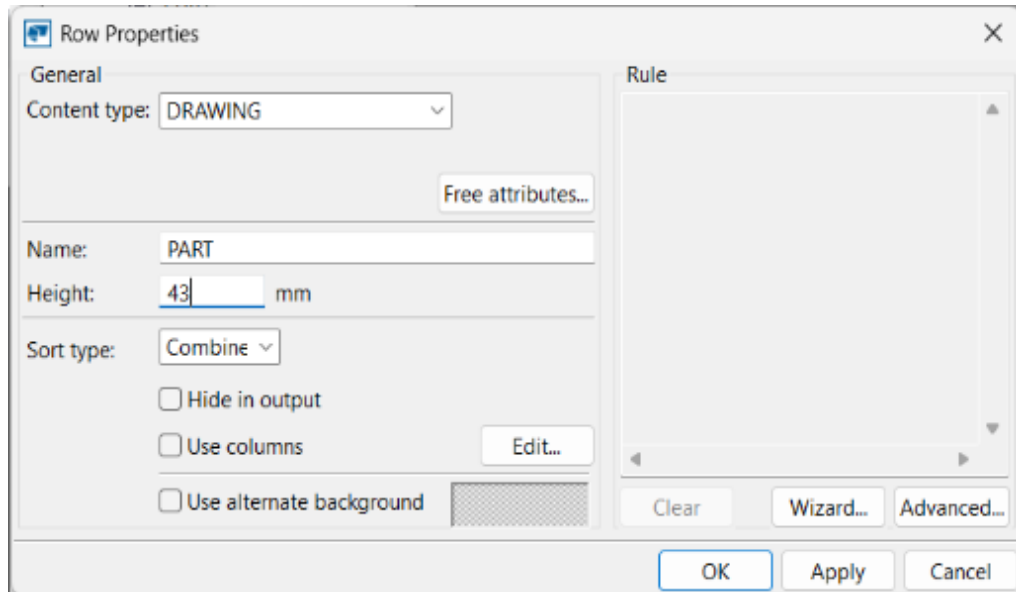
4. Click **OK**.

An empty template opens in the template work area.

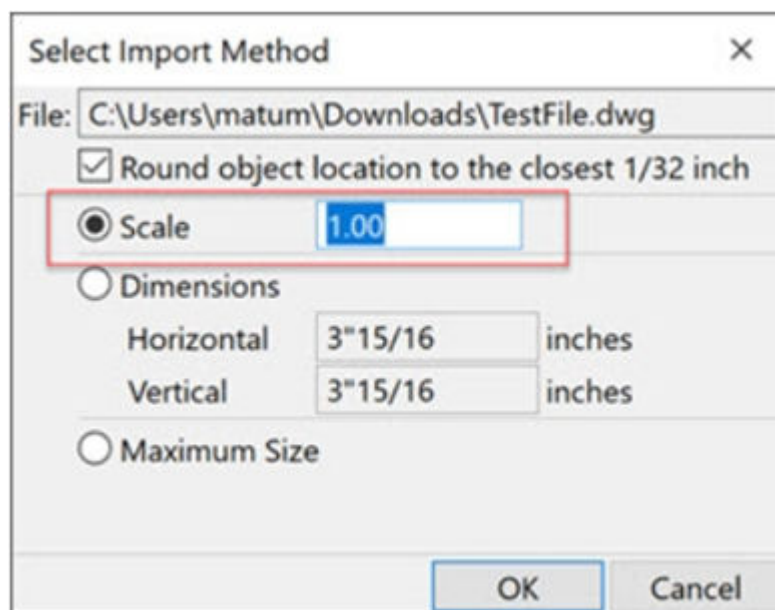


5. You may want to delete all predefined margin settings and adjust the page size later:
 - a. Double-click the template to open the **Template Page Properties** dialog.
 - b. In the **Margins** areas, empty the values from all margin boxes.
 - c. Click **OK** to save the changes.
6. All templates must be created inside a template row so next, add a row in the template for the drawing title block.
 - a. Click **Insert --> Component --> Row**.
 - b. Select DRAWING as the [content type \(page 230\)](#) for the row, and click **OK**.

The content type that you select affects the template attributes that you can add in the value fields.



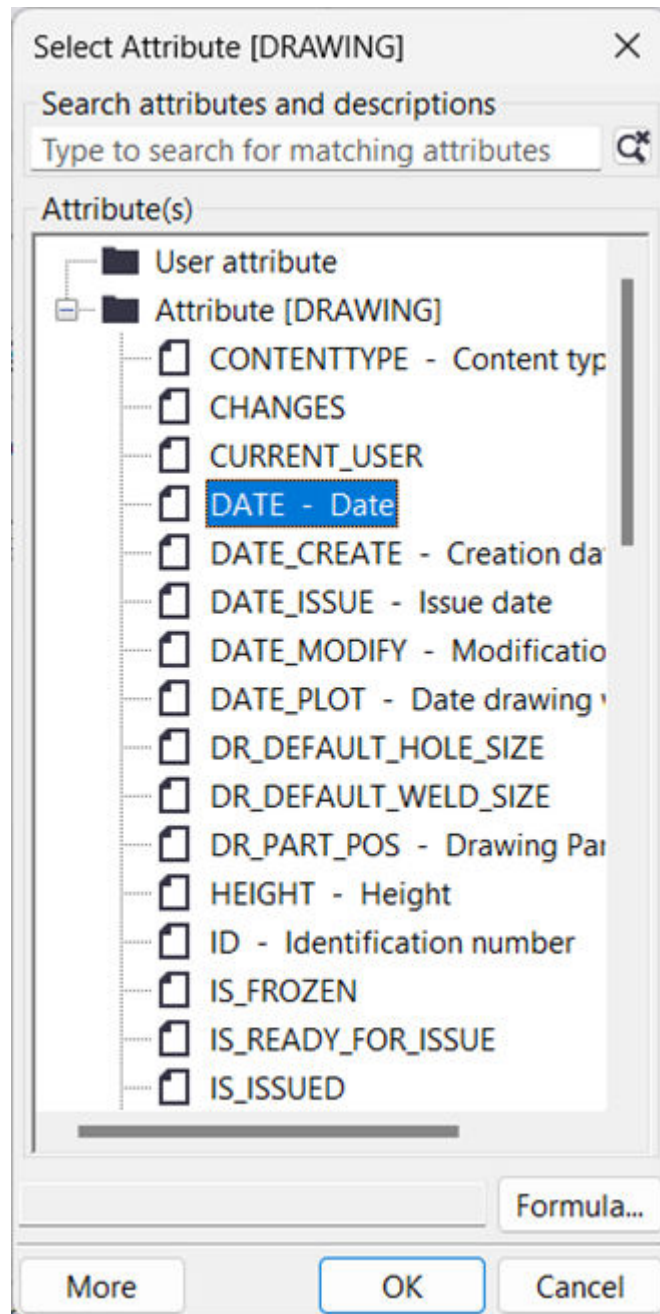
7. Select **Insert** --> **File** and browse for the DWG file.
8. Select the desired title block DWG file and click **OK**.
9. Click inside the row to insert the DWG file.
10. In the displayed **Select Import Method** dialog, set **Scale** to 1 and click **OK**.



This value depends on the units of the DWG and the Template editor. Once the DWG is inserted, you can verify that the size is correct. Often the needed conversion value is 25.4 (the conversion factor for millimeters and inches) as described in the article [Drawing Export Scale Factor for DWG/DXF](#).

11. Once the DWG file is imported, all of the elements are grouped by default. Select the group or block, right-click, and select **Ungroup**. Now you can edit or delete content from the inserted DWG title block.
12. To modify the text properties, double-click a text. The title block already contains some text labels added in the CAD software, and you might want to modify the text font, color, and size, for example.
13. To pull data from the Tekla Structures model or drawing, you need to add the necessary value fields.
 - a. Select **Insert --> Value Field** and click inside a row to place the value field in the template.
 - b. Select the desired attribute.

Select what data is to be linked. Such data corresponds to the properties in the model or drawing. You can modify the properties for value fields by double-clicking an item.



- c. Click **OK**.
- d. To modify the value field properties, double-click the field.

Value Field Properties

Content
Formula:

Attribute... Formula...

Format
Name:

Line count: ☐ Align to top

Data type: Order:

☐ Output 0 as an empty string
☐ Hide in output

Meaning:

Unit:

Decimals:

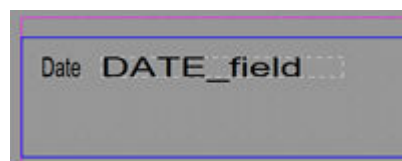
When rows are combined
☒ Don't sum values
☐ Sum values across all rows
☐ Sum values within one row

Free attributes...

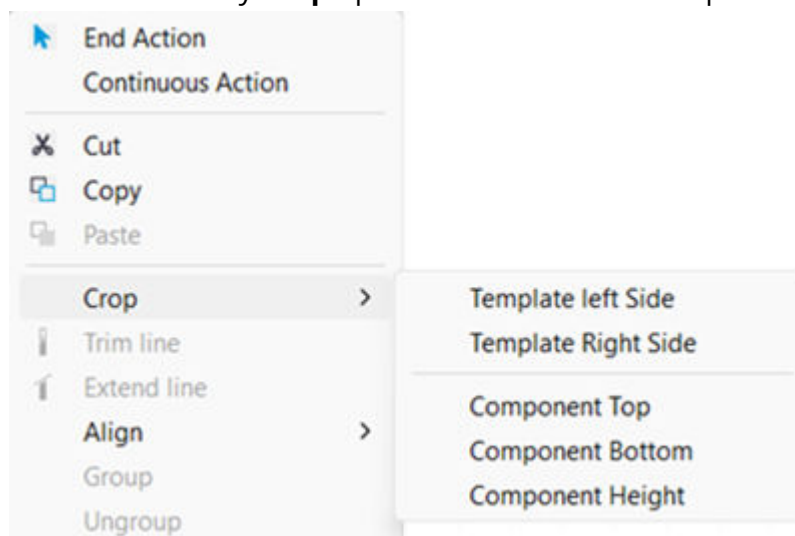
Layout
Font: Length: char(s)
Justify: Angle: deg

☐ Set as default for new value fields

OK Apply Cancel



- e. Add additional fields as desired.
14. To adjust the template size, select the row, right-click and use the necessary **Crop** options to remove excess space.



15. Save your title block template in the current model folder, project or firm folder, or in the system folder.

Now you can add the new title block template in the desired drawing layouts.

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 `DXK_SYMBOLPATH`. You can also define a firm folder for your images.
1. To open Template Editor, in Tekla Structures, go to the **File** menu and click **Editors --> Template editor**. You can also [open Template Editor from the Windows Start menu](#).
 2. Open an existing graphical template, or create a new graphical template in the Template Editor.
 3. Add a new row in the template:

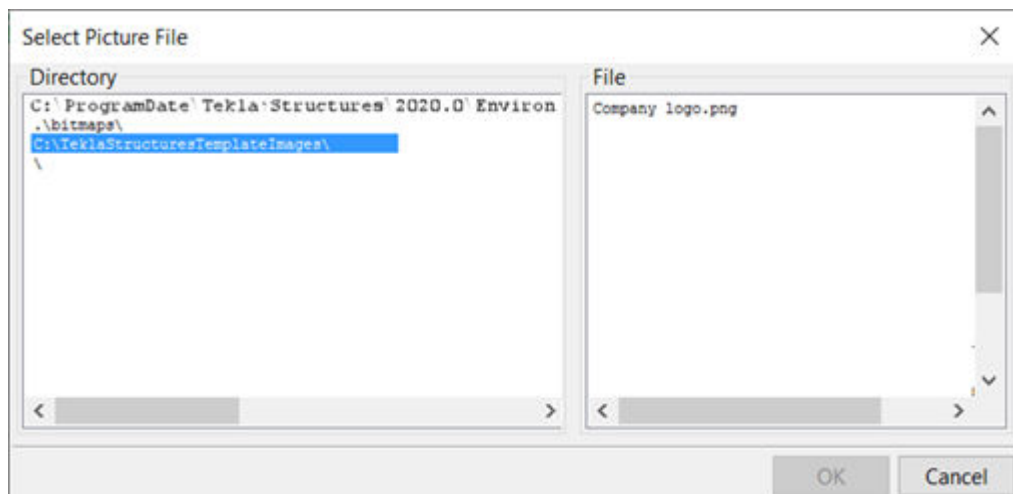
- a. To add a new row, click **Insert** --> **Component** --> **Row**.
 - b. Select a content type for the row, then click **OK**.
4. Ensure that you have the row selected, then click **Insert** > **Picture** to open the **Select Picture File** dialog.

If a local symbol 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.
5. If you have the image that you want to add in another folder, you can show this folder in the **Select Picture File** dialog:
 - 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:

Symbols, pictures (*) \..\..\common\symbols\;.\bitmaps;C:\TeklaStructuresTemplateImages\

The folder that you defined is shown in the **Directory** list:



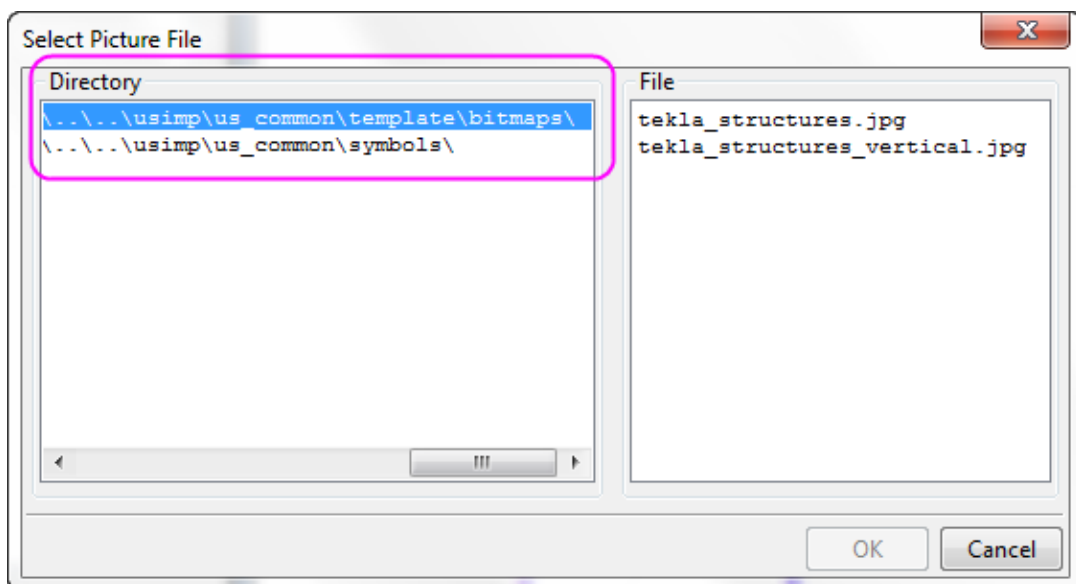
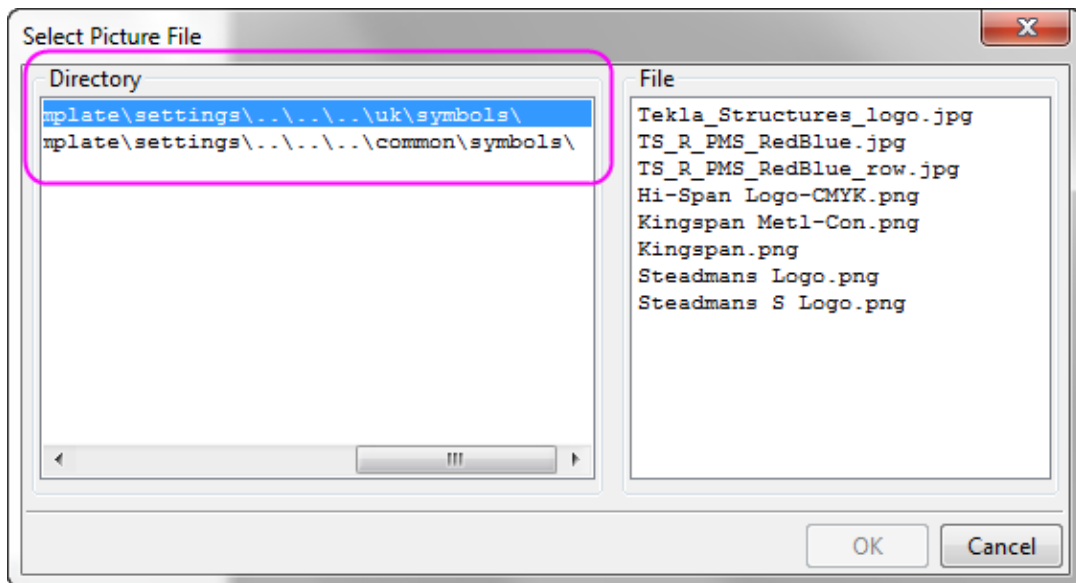
6. Select an image from the **File** list, click **OK**, and add the image.

You can adjust the size by dragging from the image handles.

If the image is shown in the template, but not in the drawing, you need to define the same path that you used for the image in Template Editor for the advanced option `DXK_SYMBOLPATH` in Tekla Structures. For more information, see [Template Logo \(Image\) from Firm folder](#).

Example

These examples of the **Select Picture File** dialog show the folder structure in different environments.



In this example, a company logo has been added in a template.

No	REV MARK	REVISION DESCRIPTION	REV. DATE
			
DRAWING TITLE	GA-drawing		
CONTRACT	Corporation		
MODELLED BY		ISSUE DATE	
CONTRACT NO	1	SCALE 1:50	
DRAWING No	[1]	REVISION No. 0	

You can also import a DWG file to be used as a title block. For more information, see [Create a title block from a DWG file \(page 221\)](#).

Content types in templates

When you create a new row in the template, you must select a content type for the row.

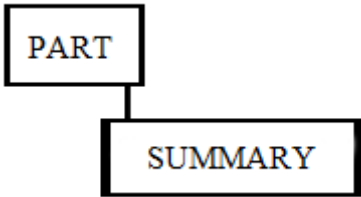
For example, when you add a row, then add a value field, the Template Editor prompts you to specify the content type. The content type determines which template attributes you can use on that row.

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.
BUILDING	Use to create lists of buildings in a building hierarchy.
BUILDING_SECTION	Use to create lists of building sections in a building hierarchy.

Content type	Description
BUILDING_STOREY	Use to create lists of building storeys in a building hierarchy.
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. This content type works only for connections and details (object type 3), not for modeling tools or custom parts (object type 4).
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: • 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.

Content type	Description
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. Note that REVISION rows cannot be defined on their own, they need to be defined together with a DRAWING row. For more information, see Revisions not appearing in drawing template .
SIMILAR_ASSEMBLY	Use to create lists of similar objects. To use this content type, you need to have an empty (hidden in output) ASSEMBLY, CAST_UNIT, PART, or REBAR_ASSEMBLY row in the row hierarchy above the row with SIMILAR_* content type: <pre> graph TD PART[PART] --- SIMILAR_PART[SIMILAR_PART] </pre> 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. For an example of using SIMILAR_ASSEMBLY in a template, see Similar assemblies in templates .
SIMILAR_CAST_UNIT	
SIMILAR_PART	
SIMILAR_REBAR_ASSEMBLY	

Content type	Description
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.
SPACE	Use to create lists of spaces in a building hierarchy.
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 <code>INCLUDE</code> sentences. The order of the files included in <code>contentattributes.lst</code> 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 <code>contentattributes.lst</code>. 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 <code>objects.inp</code> 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 `tpld.ini` file. The location of the `tpld.ini` file is defined by the advanced option.

The following pointers are allowed in the `tpld.ini` file:

- `@\` = location of the `tpld.ini` file
- `.\` = location of `tpld.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:

1	2	3	4
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

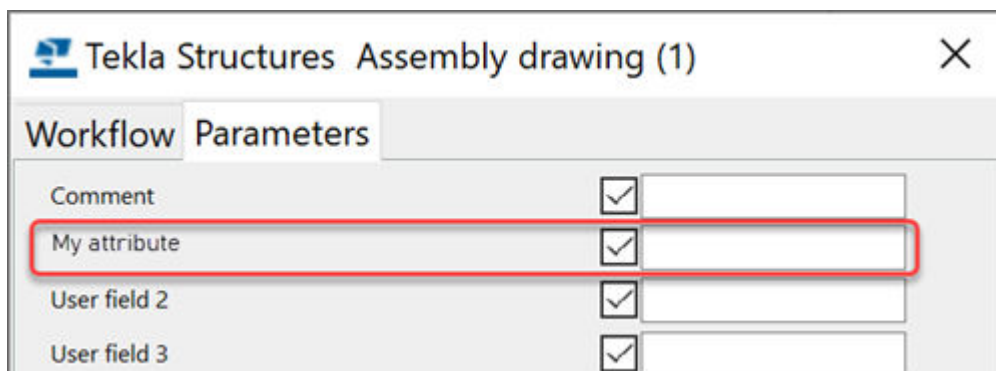
1. The content type of the row in Template Editor
2. The attribute hierarchy in Template Editor

3. Customizable comments, such as the tab name in the user-defined attributes dialog
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.
By default, this file is located in `.. \Program Files\Tekla Structures\<version>\bin\applications\Tekla\Tools\TplEd\settings`, but the location might be different in your environment.
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:

<code>MORTAR_WIDTH</code>	<code>FLOAT</code>	<code>RIGHT</code>	<code>TRUE</code>
<code>MY_ATTRIBUTE</code>	<code>CHARACTER</code>	<code>LEFT</code>	<code>TRUE</code>
<code>OBJECT_LOCKED</code>	<code>CHARACTER</code>	<code>LEFT</code>	<code>TRUE</code>

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")  
//   =====
```

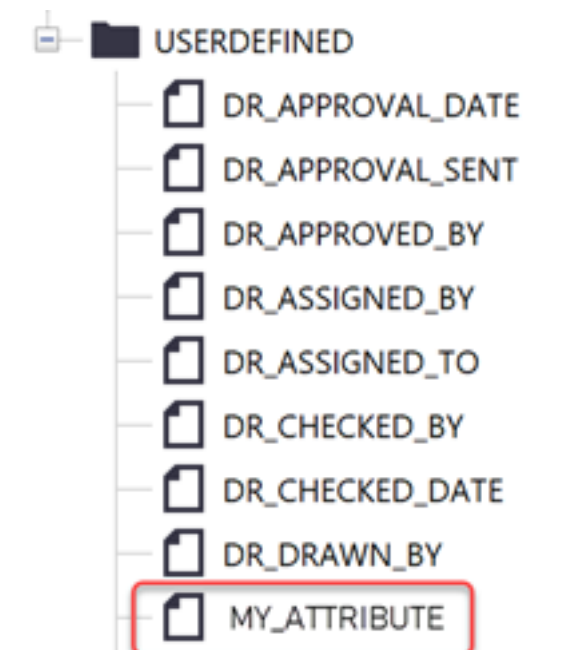
DRAWING = USERDEFINED.MY_ATTRIBUTE

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.

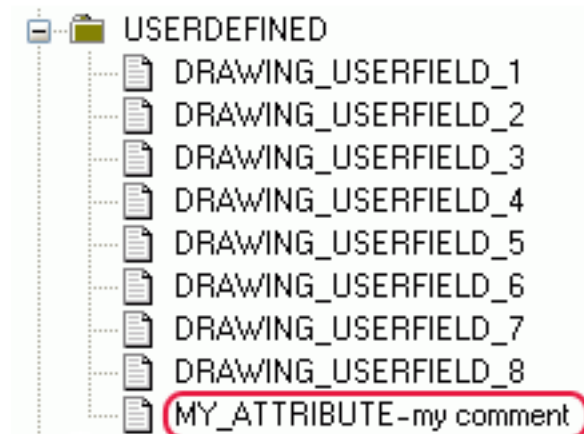
3. Add your comment inside quotation marks, after the attribute name.

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.

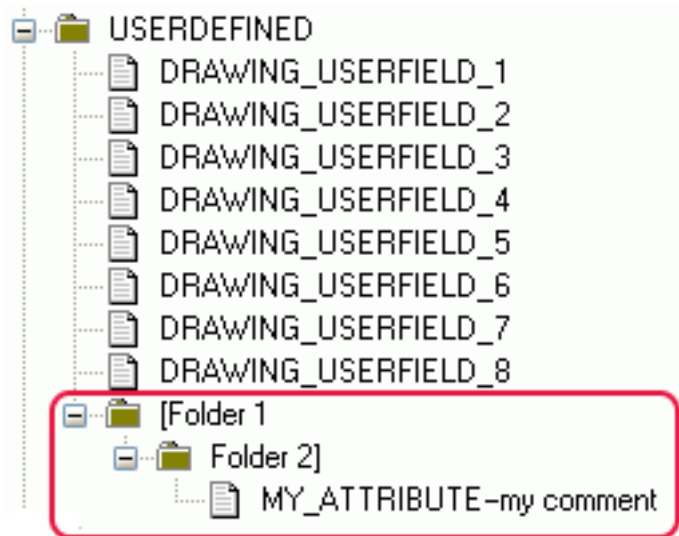
For example:

```
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 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. 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.

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 parameters (unit and precision strings), see the `valuefieldclasses.lst` file located in the `..\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.

```
//
-----
// Value field classes
// =====
//
// This file contains a list of valid class-properties for value fields
// - These types are defined in the source code.
// - The maximum length of a class-property is 63 characters.
// - Use only letters, numbers, slashes and underlines.
//
// Notes:
// - Updating of this list is allowed only for the person who is
responsible
//   of the source code of the Tekla Structures!
// - Installation of Tekla Structures always overwrites this file.
//
-----
//
// Class          =          units { presicions }

Length           =          mm, dm, cm, m, inch, ft, yd, inch-frac
{1/2, 1/4, 1/8, 1/16, 1/32, 1/64 }, ft-frac { 1/2, 1/4, 1/8, 1/16, 1/32,
1/64 }
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-yyyy, 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/yy
LeadingZeroes
DistanceList     =          mm, dm, cm, m, inch, ft, yd, inch-frac
{1/2, 1/4, 1/8, 1/16, 1/32, 1/64 }, ft-frac { 1/2, 1/4, 1/8, 1/16, 1/32,
1/64 }
MassFlow         =          kg/s, lb/s, kg/h
VolumeFlow       =          m3/s, ft3/s, l/s
HeatCapacity     =          J/K*kg, btu/F*lb, kJ/K*kg
```

PressureLoss	=	kPa/m, psi/ft, Pa/m, hPa/m
Velocity	=	m/s, ft/s
FlowCoefficient	=	Kv, Cv
DynamicViscosity	=	Pa*s, kg/m2*s, lb/ft2*s
Power	=	W, kW
KinematicViscosity	=	m2/s, ft2/s
Percentage	=	%

Solve performance issues

- Optimize graphical templates if the drawing opening progress dialog shows the message "Updating tables" longer than expected.
- Avoid large bitmaps or graphics in graphical templates.
- Look for dtkit errors and warnings in the session history log
TeklaStructures_<user>.log. For more information about the log files, see [Log files about the operation of Tekla Structures \(page 102\)](#)

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 Connect](#).

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 Connect](#).

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 company account where the user has the employee role becomes the [model owner](#). In Tekla Model Sharing, a company account always owns all the models shared by the users in the account. A shared model is always owned by only one account.

You can view and manage the shared models owned by your company's account 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](#)

Install the cache service for Tekla Model Sharing

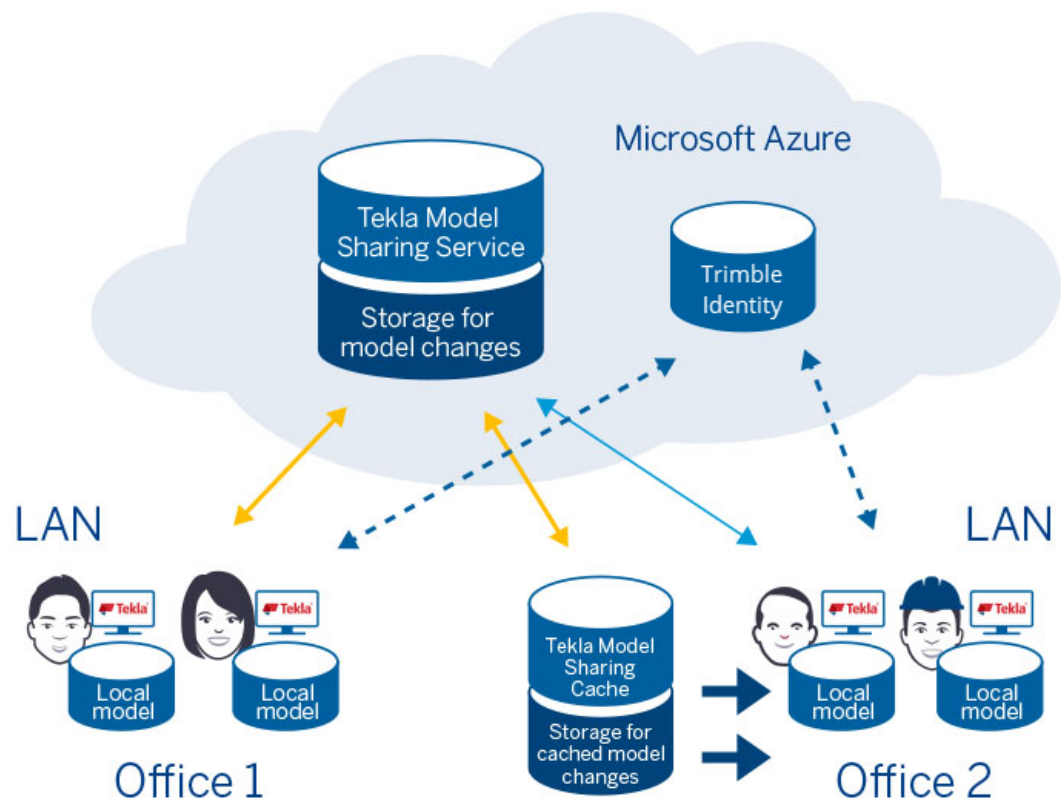
Using the cache service for Tekla Model Sharing makes downloading model data faster when the same data is requested more than once, such as when several users in the same office are working in a shared model. The cache service is especially helpful in locations where download speed might be limited.

The cache service downloads model data from the Tekla Model Sharing service and caches the data in the file system in a local area network (LAN). The first time that a user fetches a packet, it is stored in the cache service. Any later requests for the same packet are served from the cache service in the LAN. The cache is not used for packets that are written out.

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 because the model data is available locally in the cache service. Also, because the model data

is always loaded in small data blocks, the cache service can download any missing blocks later if the download is interrupted.

This image shows how the model data is stored in the sharing service and used with the cache service for Tekla Model Sharing.



NOTE If the cache service cannot be reached, Tekla Structures uses the cloud storage for model changes directly. Tekla Structures also uses the cloud storage if the connection to the cache service times out while a download operation is in progress.

You can see whether Tekla Structures is using the cache service by checking the `ClientLog_cat.txt` and `ClientLog_dog.txt` log files in the `\Users\<user>\AppData\Local\Tekla DataSharing` folder.

Data is not automatically cleared from the cache service. To clear unnecessary data, you can delete old files from the cache service.

Compatibility with Tekla Structures

There are parallel versions of the cache service for Tekla Model Sharing that are compatible with different versions of Tekla Structures.

Cache service for Tekla Model Sharing version	Compatible Tekla Structures versions
4	2026 and later

Cache service for Tekla Model Sharing version	Compatible Tekla Structures versions
3	2020 to 2025

If you use both Tekla Structures 2026 or later, and an earlier version of Tekla Structures, you can install both versions of the cache service for Tekla Model Sharing even on the same computer.

Software and system requirements for cache service installation

The computer or server where you install the cache service must have:

- One of these Windows operating systems:
 - Windows Server 2019 or later
 - Windows 11 or later
- Version 3 of the cache service requires Microsoft .NET Framework 4.8 or newer. This software is not included in the Tekla Model Sharing Cache server installation package.
- Version 4 of the cache service requires Microsoft .NET 10 or newer. This software is automatically installed when you install the Tekla Model Sharing Cache server.
- An internet connection to download model data from the sharing service
- Enough disk space to store the cached model data.

The required disk space can vary from a few gigabytes to terabytes, depending on the number of Tekla Model Sharing users and the size of the models.

Ensure that your firewall allows inbound traffic to the cache service host on TCP/IP ports 9001 and 9998 for version 3 or 11001 and 11002 for version 4. If the ports cause conflicts with other services, you can change the ports in the Tekla Model Sharing cache server installer.

Download and install the cache service for Tekla Model Sharing

1. Download the Tekla Model Sharing cache server installation file from [Trimble Downloads](#).
Ensure that you download the version that is compatible with the version of Tekla Structures that you use.
2. 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.

- The default TCP/IP port number for the cache service is 9998 for version 3 and 11001 for version 4.

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 for version 3 and 11002 for version 4.

This port is automatically fetched from the cache service, and it is used for the data transfer.

3. 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.

Modify settings for the cache service after installation

If needed, you can modify the settings for the cache service after installation, such as to change the previously set cache folder or port numbers.

To modify the settings, run the `TeklaModelSharingCacheService.exe` installation file again and select **Repair**.

- If you change the previously set cache folder, copy any content that you want to continue using from the previous cache folder to the new folder.
- If you change the port numbers, make sure that your firewall allows inbound traffic on the new ports.

Configure Tekla Structures client workstations to use the cache service

1. In Tekla Structures, on the **File** menu, click **Sharing --> Sharing settings**.
2. Configure the **Tekla Model Sharing cache** settings in the **Sharing settings** dialog:

- a. In the **Name** box, enter the name of the computer on which the cache is installed.

To check the computer name in Windows, select **Windows Control Panel --> System and Security --> System**.

If the computer on which the cache is installed has a static IP address, you can enter the IP address in the **Name** box instead of the computer name.

- b. In the **Port** box, enter the cache service port number that you set when you installed the cache service.

The default value is 9998 for version 3 and 11001 for version 4.

3. Click **Set**.

Troubleshoot the cache service

Problem	Possible solutions
Cannot connect to the cache service from Tekla Structures	• Ensure that the Tekla Model Sharing cache Windows Service is running. • Ensure that your firewalls allow inbound traffic on the TCP/IP ports configured for the cache service for Tekla Model Sharing. The default ports are 9001 and 9998 for version 3, and 11001 and 11002 for version 4.
Cache service does not start	Check the Application Log in the Windows Event Viewer for errors.

Set the Log On account for the Tekla Model Sharing cache Windows service

If the Tekla Model Sharing cache service needs to access some special resources, such as shared network drives, ensure that the **Log On** account for the cache Windows service has permissions to access those resources. The **Log On** account also needs to have reading and writing permissions for the `C:\ProgramData\Tekla\ModelSharingCache` folder.

By default, the **Log On** account for the cache Windows service is **Local System Account**. You might need to change the account if the Local System Account does not have access to these folders and resources.

We recommend that you use the same account for installing the cache service and as the **Log On** account for the cache Windows service.

1. Right-click the cache Tekla Model Sharing cache Windows Service in the **Services** dialog, then select **Properties**.
2. On the **Log On** tab, select **This Account**, then enter the account name and password.
3. 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.

WARNING Sharing point clouds using a URL can allow other Trimble Connect users to access your data if they have the URL. Do not use this method to share data that you want to keep confidential.

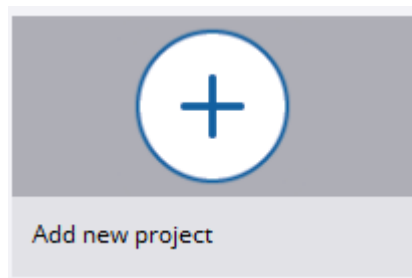
Create a potree file with Point cloud manager

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.

Add new project

Information

Project name *

MyPotree

Description (optional)

This is the planned location.

Create

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**.

▼ Conversion settings

Converter version: 2

Encoding: BROTLI

Reset source coordinate system to:

XYZ format ⓘ:

☐ Intensity

☒ RGB

Start

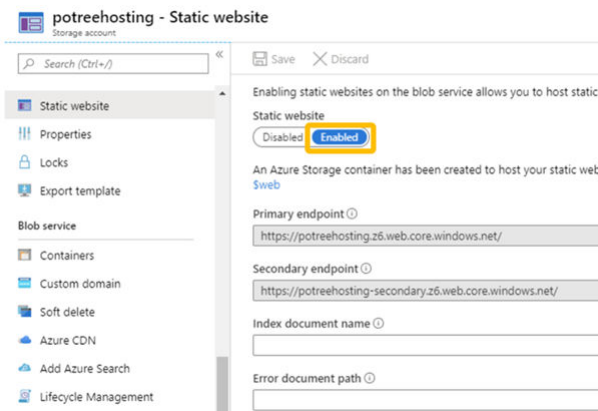
The potree data is now available in the root folder for the project.

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.

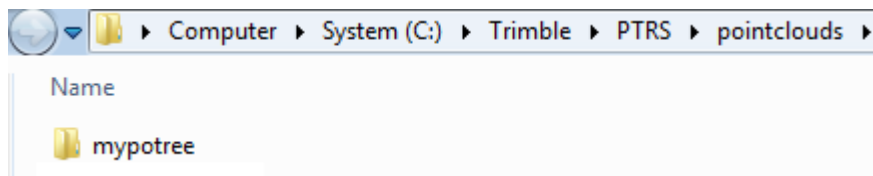
3. In the **CORS** settings, add a CORS rule for the **Blob service**, then configure the rule settings.

CORS rule setting	Description
Allowed origins	Specifies which domains are allowed to access the resources. - To use your point cloud data with the Trimble Connect for Browser 3D viewer, enter https://web.connect.trimble.com/. - To allow only specific domains, enter the domains. Separate multiple domains with a comma. The origin must be an exact case-sensitive match with the origin that the user agent sends to the service. You can use the wildcard character (*) instead of a subdomain to allow all subdomains of a domain to access the resources. For example, *.example.com allows all subdomains of example.com to access the resources. - To allow all domains, enter *.

CORS rule setting	Description
Allowed methods	Specifies which HTTP methods are allowed when making requests. Enter <code>GET</code> .
Allowed headers	Specifies which HTTP headers are allowed when making requests. To allow all headers, enter <code>*</code> .
Exposed headers	Specifies which headers JavaScript in browsers is allowed to access. To allow all headers, enter <code>*</code> .
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.

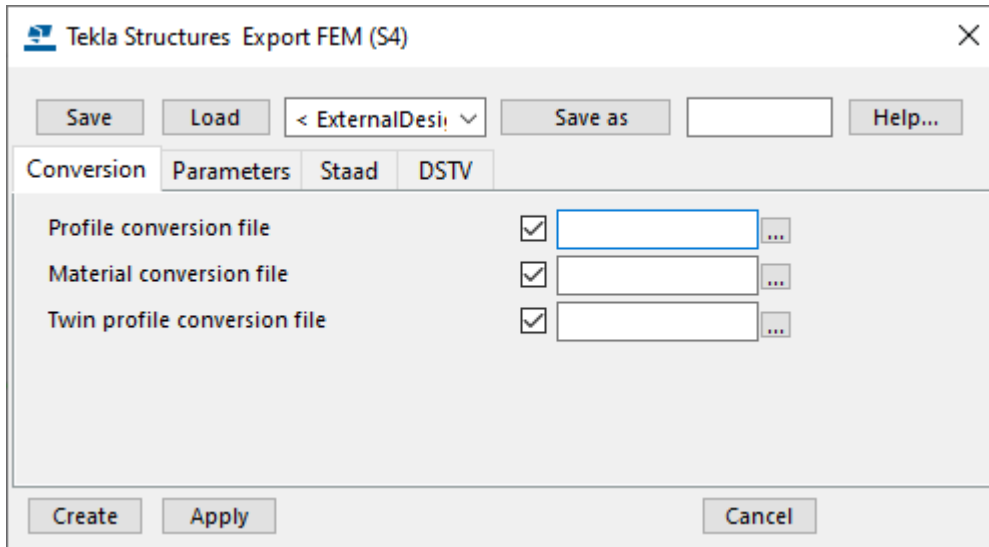
- [Conversion files \(page 254\)](#) (.cnv) map Tekla Structures profile, twin profile, and material names with names used in other software.
- You can create property sets for IFC export and save them in [property set configuration files \(page 258\)](#).
- Tekla Structures produces NC files in [DSTV format \(page 270\)](#).
- The [file \(page 272\)](#) is used when converting from DSTV to DXF format using `tekla_dstv2dxf.exe`.
- [files \(page 282\)](#) describe parts to be imported.

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 is an example of an SDNF conversion file:

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
H100*50*5*7 H100X50
H100*100*6*8 H100X100
H125*60*6*8 H125X60
H125*125*6.5*9 H125X125
H148*100*6*9 H148X100
H150*75*5*7 H150X75
H150*150*7*10 H150X150
H175*90*5*8 H175X90
H194*150*6*9 H194X150
H198*99*4.5*7 H198X99
```


H200*100*5.5*8 H200X100

H200*200*8*12 H200X200

H200*204*12*12 H200X204

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
```

```
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
```

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. It is easier to convert members that are modeled as two members.

Create property sets for IFC export

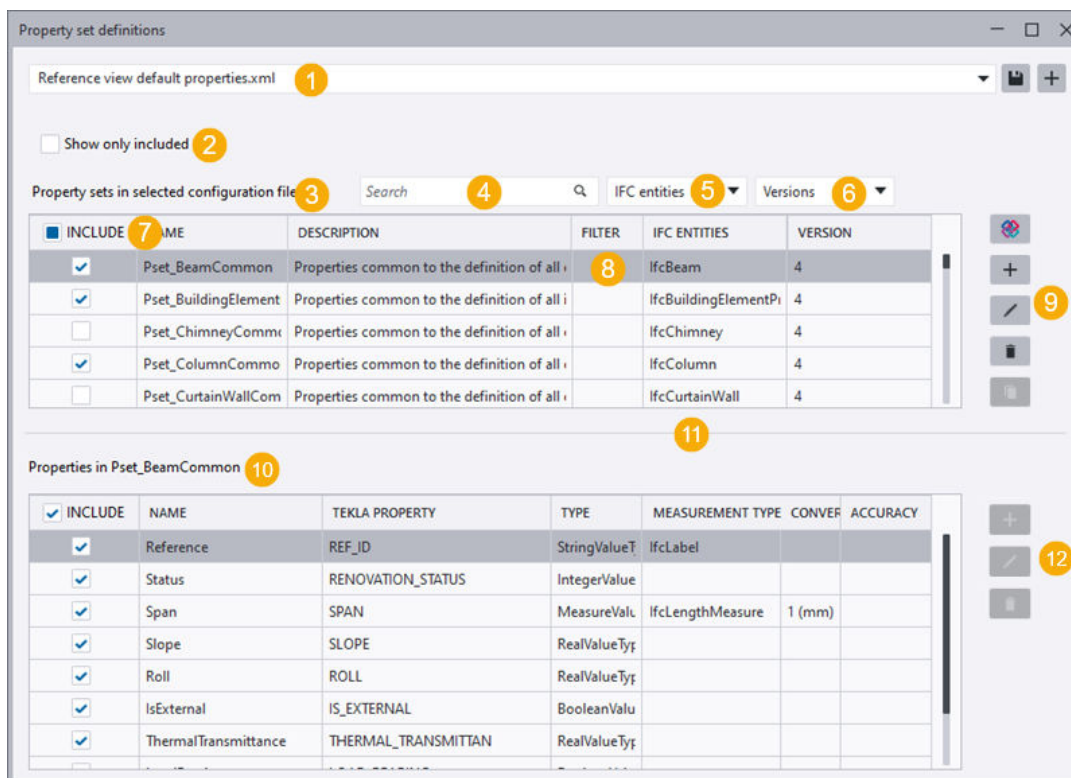
You can create property sets from template attributes and user-defined attributes, define properties for the attributes, and bind the Tekla Structures property sets to IFC entities for IFC export. You can save the property sets in property set configuration files.

You can use the default property sets, and you do not need to create any custom property sets if the default property sets work for you. You can also modify the default property sets. In addition, you can import buildingSMART property sets.

When Tekla Structures exports an IFC file, it uses the configuration file you selected in the **Property sets** list to export property sets with the exported IFC entities. The list of configuration files includes predefined files located in your environment folders (\common\collaboration\ifc) and files stored in the \AdditionalPsets folder under the current folder.

The **Property set definitions** dialog allows you to add and modify the property sets needed in the IFC export. The property set configuration files that you create, will be visible in both IFC2x3 export and IFC4 export.

NOTE We recommend that you define property sets only in the **Property set definitions** dialog instead of modifying the file itself to ensure that the XML configuration files are valid.



(1) The name of the selected property set configuration file. In the list, you can see all the available configuration files stored in your environment folders, and select the desired file. The file is loaded automatically after selection.

Use the  **Save** button to save the changes in the configuration file after you have added or modified the property sets. You can also give a new name for the configuration file and save it. New and modified configuration files are saved in the `\AdditionalPsets` folder under the current model folder. You can also read configuration files from the following folders:

XS_FIRM

XS_PROJECT

XS_SYSTEM

Use the  button to clear the contents of the displayed configuration file and create a new configuration file.

(2) To show in the list only the property sets and properties that you have selected using the **Include** checkbox, select **Show only included**.

(3) Property sets in the current configuration file. You can drag property sets up or down in the list.

(4) Search for a specific property set. The list of property sets might be very long, and the search could be very useful when you want to find and select a specific property set.

(5) Show only the property sets for the selected IFC entities.

(6) Show only the property sets for the selected IFC versions.

(7) To export all property sets and all properties in the list, select the **Include** checkbox on the title row for the property set or properties section. To export only the needed property sets and properties for different export purposes, select the checkbox next to a specific property set or property.

(8) Filters allowing you to further limit for which objects to export the property set. For example, specify a filter to further limit which IfcBeam objects to export the property set for, like for steel beams only.

(9) Command buttons for working with property sets:



Add buildingSMART property sets. The property sets beginning with *Pset_* or *Qto_* are buildingSMART property sets. The buildingSMART property sets are protected, and you cannot change the IFC entities that they are exported with, or edit the names of the properties they contain. However, you can edit the properties in the buildingSMART property sets, and select to include or exclude them.



Add a property set.



Edit the selected property set.



Delete the selected property set.



Duplicate the selected property set. You can then modify the property set so that the properties are the same but the filtering criteria are different, for example.

(10) Properties in the selected property set. You can drag properties up or down in the list.

(11) To enlarge the property set section or the property section, drag the dialog divider up or down.

(12) Command buttons for working with properties:



Add a property in the selected property set.



Edit the selected property.



Delete the selected property from the selected property set.

Create a custom IFC property set configuration file

In addition to the default configuration files, you can create custom configuration files.

1. On the **File** menu, click **Export --> IFC** or **Export --> IFC4**.

2. Select **<new>** from the **Property sets** list and click the  **Edit** button.
The **Property set definitions** dialog opens.
You can also create a new configuration file in the **Property set definitions** dialog by clicking the  button next to the  button at the top.
3. Add the needed property sets. For details, see "Add property sets" below.
4. Enter a name for the configuration file.
5. Click  **Save**.

New and modified configuration files are saved in the \AdditionalPsets folder under the current model folder. You can also read configuration files from the following folders:

XS_FIRM

XS_PROJECT

XS_SYSTEM

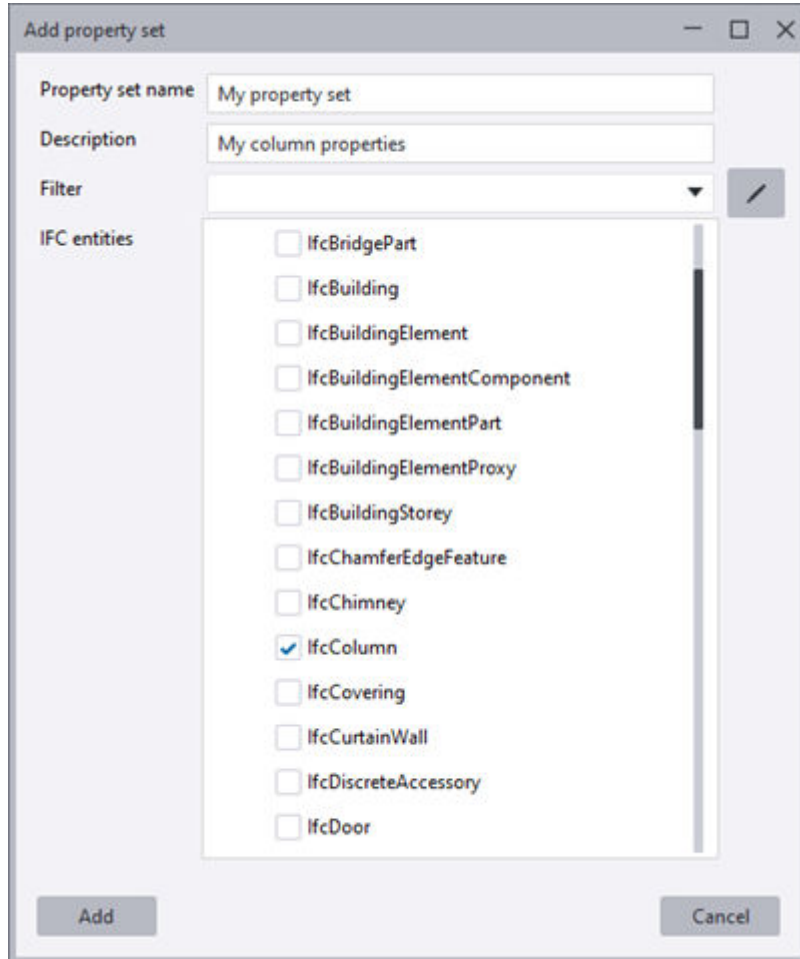
Next, add property sets in the configuration file.

Add property sets

You can add both custom property sets and buildingSMART property sets in a configuration file. For example, you can add COGs and start and end points on the part level, and scheduling information on the assembly level.

1. In the **Property set definitions** dialog, open a property set configuration file.

2. To add a custom property set, in the property set section, click  **Add property set to this configuration file.**



The screenshot shows the 'Add property set' dialog box. The 'Property set name' field is filled with 'My property set'. The 'Description' field is filled with 'My column properties'. The 'Filter' dropdown is empty. The 'IFC entities' list includes the following items: IfcBridgePart, IfcBuilding, IfcBuildingElement, IfcBuildingElementComponent, IfcBuildingElementPart, IfcBuildingElementProxy, IfcBuildingStorey, IfcChamferEdgeFeature, IfcChimney, IfcColumn (checked), IfcCovering, IfcCurtainWall, IfcDiscreteAccessory, and IfcDoor. The 'Add' button is at the bottom left and the 'Cancel' button is at the bottom right.

3. In the **Add property set** dialog, enter the property set name and description.

The property set name may contain any text, including spaces. The maximum length of the property set name is 255 characters. Do not start the property set name with prefixes *Pset_* or *Qto_*, these prefixes are reserved for buildingSMART property sets.

4. You can use a filter to further limit which objects get exported with a given property set.

For example, specify a filter to further limit which IfcBeam objects to export the property set for, like for steel beams only.

Do one of the following:

- Select an existing filter from the list of filters.

- Create a new filter: click the  **Display filter** button. In the **Object group - IFC property export** dialog, create a filter, set **Filter type** to **IFC property export**, and save the filter.
5. Select the IFC entities for the property set. You must select at least one IFC entity.
 6. To save the new property set, click **Add**. Now you can add properties in the new property set, see "Add properties in a property set" below.
 7. To add buildingSMART property sets, click  **Import buildingSMART property sets**. For details about adding buildingSMART property sets, see "Add a buildingSMART property set" below.
 8. When you have added all the property sets and properties, click  **Save** to save the current configuration file.

When you have several property sets in the list, you can drag those up or down in the list.

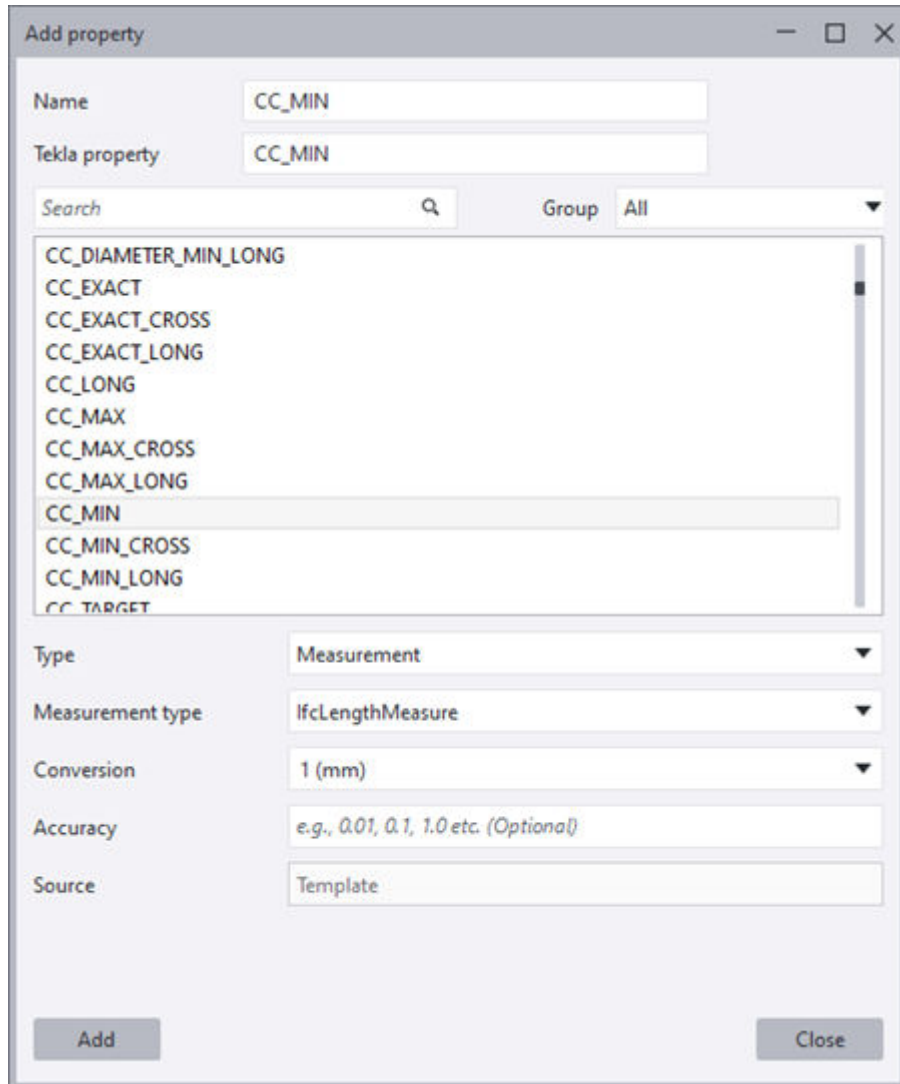
Add properties in a property set

You can add properties in an existing property set.

NOTE The buildingSMART property sets are protected, and you cannot add properties in those. Property sets with names beginning with *Pset_* or *Qto_* are buildingSMART property sets. However, you can modify the properties included in buildingSMART property sets.

1. Open a property set configuration file in the **Property set definitions** dialog.

2. Select a property set from the property set list, and in the property section, click  **Add property to this property set.**



In the displayed **Add property** dialog, all the default properties are listed. You can search for properties, or use the **Group** dropdown options to narrow down the list according to the object type.

3. Click a property to select it. When you have selected a property, **Name**, **Tekla property**, and **Type** are filled in automatically.

You can change the **Name** of the property. Once you have changed the **Name**, it no longer changes automatically.

4. To change the type of the property, click the **Type** drop-down.

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**

5. If you selected **Measurement** as the type, more settings are displayed:

Measurement type: Select the appropriate measurement type from the list.

Conversion: Select the unit conversion factor. The available options depend on the selected measurement type.



In the area property conversion, the 1E-06 factor is used, and 1E-06 = 0.000001. For example, 1 m² is 1000000 mm² in Tekla Structures. In IFC, the area unit is m², and the Tekla Structures value needs to be converted by 1E-06: 1000000 mm² x 1E-6 = 1 m².

In the volume property conversion, the 1E-09 factor is used, and 1E-09 = 0.000000001.

Accuracy: Indicate the accuracy that is used when writing the property to IFC. Enter decimals, for example, 0.1 or 0.01. 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.

You cannot change the **Source** value, it is either [Template \(page 233\)](#) or [UDA \(page 234\)](#) depending on the property that you selected.

6. Select the desired values and click **Add**.

7. To save the changes in the property set configuration file, click  **Save**.

When you have several properties in the list, you can drag those up or down in the list. To modify the created property set, select the property set and click

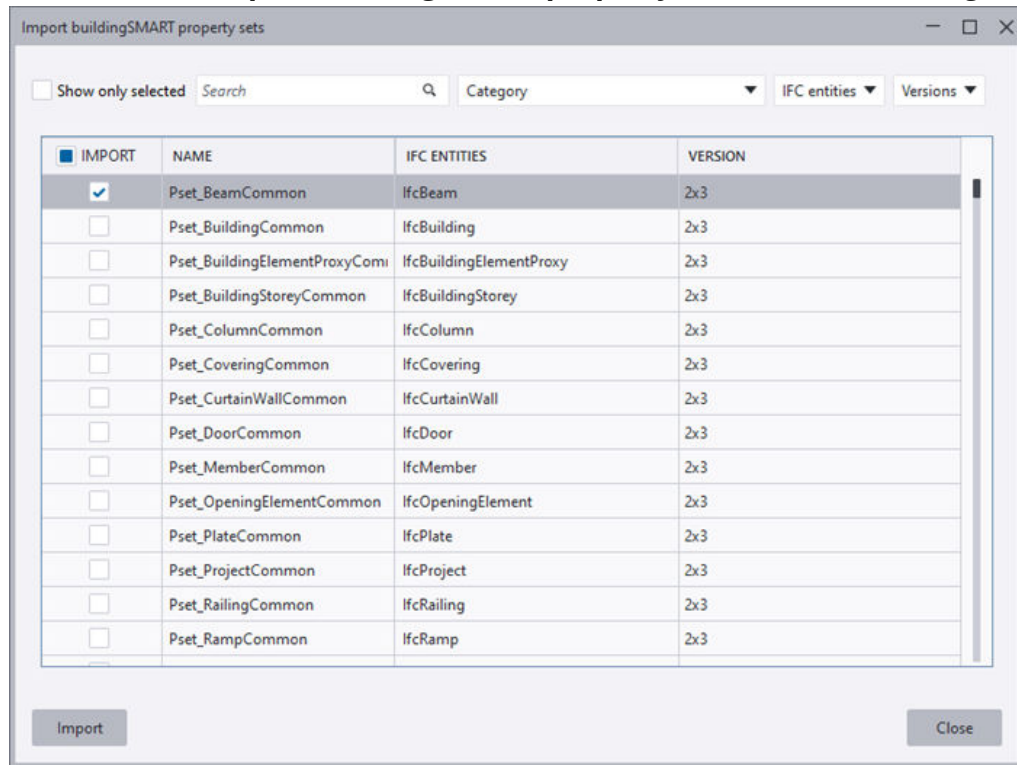


Modify selected property set.

Add a buildingSMART property set

You can add buildingSMART property sets to property set configuration files.

1. In the **Property set definitions** dialog, open the property set configuration file where you want to add buildingSMART property sets.
2. Click the  **Import buildingSMART property sets** button on the right.



3. Select the property sets that you want to add. To do this, select the **Import** checkbox next to the property set. You can search for property sets using the **Search** box. You can also limit the number of the displayed property sets by selecting the desired property set categories, IFC entities, or IFC versions.
4. Click **Import**. The selected buildingSMART property sets are added in the property set list. The buildingSMART property sets are protected, and you cannot edit those, but you can exclude the unnecessary buildingSMART property sets from the export, and change and edit the mapped Tekla properties.
5. To save the changes in property set configuration file, click  **Save**.

Delete a property set

If a property set is no longer needed, you can delete it from the configuration file.

1. In the **Property set definitions** dialog, a custom property set configuration file.
2. Select a property set from the property set list.
3. Click the  **Delete selected property sets.**
4. To save the changes in property set configuration file, click  **Save.**

If you do not want to include the property set in the export but still want to leave the property set in the configuration, clear the **Include** checkbox next to the property set.

Delete properties from a property set

If a property is no longer needed in a property set, you can delete it.

The buildingSMART property sets (beginning with prefixes *Pset_* or *Qto_*) are protected, and you cannot delete properties from those. However, you can exclude properties included in buildingSMART property sets, see section "Include or exclude property sets or properties" above.

1. Open a property set configuration file in the **Property set definitions** dialog.
2. In the property set list, select a property set from which you want to delete a property.
3. Select a property from the property list.
4. Click the  **Delete selected property.**

If you do not want to include the property in the export but still want to leave the property in the property set, clear the **Include** checkbox next to the property.

Duplicate a property set

When you want have a new property set that is very similar to an existing property set, you can duplicate the existing property set. You can then modify the property set so that the properties are the same but the filtering criteria is different, for example.

You cannot duplicate a buildingSMART property set.

1. Open a property set configuration file in the **Property set definitions** dialog.
2. In the property set list, select a property set that you want to duplicate.
3. Click  **Duplicate selected property set.**

The property set is duplicated and added under the original property set in the list.

- To modify the property set, select the duplicated property set and click  **Modify selected property set**. Change the property set name, select the desired entities, and specify another selection filter, for example.

Change the property set name, select the desired entities, or specify a selection filter that exports the property set for some other objects, for example.

- When you are done, click **Modify**.

Include or exclude property sets or properties

You can keep a property set or a property in the configuration file, but exclude it from the export.

You can also exclude buildingSMART property sets and properties.

- On the **File** menu, click **Export --> IFC** or **Export --> IFC4**.
- Select an existing property set from the **Property sets** list and click the  **Edit** button.
- Do one of the following:
 - To export all property sets in the list, select the **Include** checkbox on the title row of the property set section.
 - To export all properties for the selected property set, select the **Include** checkbox on the title row of the properties section.
 - To export only the needed property sets, select the checkboxes next to the property sets.

☒	WorkflowAssembly
☒	LocationBreakdownStructureAssembly
☒	CenterOfGravity
☐	StartEndPoints

- To export only the needed properties for the selected property set, select the checkboxes next to the properties.

☒	WIDTH
☒	HEIGHT
☐	CLASS_ATTR

- To save the changes in property set configuration file, click  **Save**.

Property set configuration file contents

A property set configuration file contains the structure of the property sets, and the data definitions for the properties inside the property sets.

When configuring property sets for IFC export in XML format, two files are needed:

- `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. There is only one schema file in your environment. You do not need to touch this file.
- The XML file `<configuration_file_name>.xml` is the actual property set configuration file.

The modified configuration files are saved in the `\AdditionalPsets` folder under the model, and they are also read from the system, project, and firm folders.

- The property set XML configuration file contains the following definitions:
 - 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.
 - Possibility to use default values.
 - Possibility to ignore the set to export if template attribute or UDA does not have a value.
- Below is an example of the contents of a property set configuration XML file.

```
<PropertySet referenceId="assemblies" isIgnored="false">
  <Name>Tekla Assembly</Name>
  <Description>Assembly Properties</Description>
  <Properties>
    <Property xsi:type="PropertySingleValueType" optional="true"
isIgnored="false">
      <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"
isIgnored="false">
      <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"
isIgnored="false">
    <Name>Assembly/Cast unit top elevation</Name>
    <PropertyValue xsi:type="StringValue" stringType="IfcLabel">
      <GetValue xsi:type="TemplateVariableType">
        <TemplateName>ASSEMBLY_TOP_LEVEL</TemplateName>
      </GetValue>
    </PropertyValue>
  </Property>
  <Property xsi:type="PropertySingleValueType" optional="true"
isIgnored="false">
    <Name>Assembly/Cast unit bottom elevation</Name>
    <PropertyValue xsi:type="StringValue" stringType="IfcLabel">
      <GetValue xsi:type="TemplateVariableType">
        <TemplateName>ASSEMBLY_BOTTOM_LEVEL</TemplateName>
      </GetValue>
    </PropertyValue>
  </Property>

```

- The configuration file also contains the rules for binding the property sets to IFC entities:
 - Binding to IFC entity type hierarchy including support for not only building elements but also for bolts, reinforcing bars, and assemblies.
 - You have the possibility to use limiting rules, such as Equal, NotEqual, LessThan, GreaterThan, LessThanOrEqual, and GreaterThanOrEqual for numbers, and Equal and NotEqual for texts.

If you want to add any limiting rules, you need to modify your custom property set configuration file using a suitable text editor.

 - 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.

```

<PropertySetBind referenceId="assemblies">
  <Rules>
    <Include entityType="IfcElementAssembly" subtypes="true" />
  </Rules>
</PropertySetBind>

```

- If no value is found for a property in the export, the export does not write the property set at all. To avoid this, add `optional=true` for that property in the property set.

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 DSTV 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
C	C 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

Letter	Part face
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 conversion 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

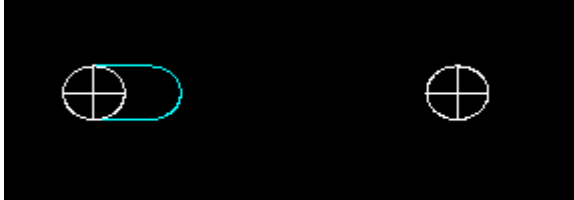
HOLES:



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

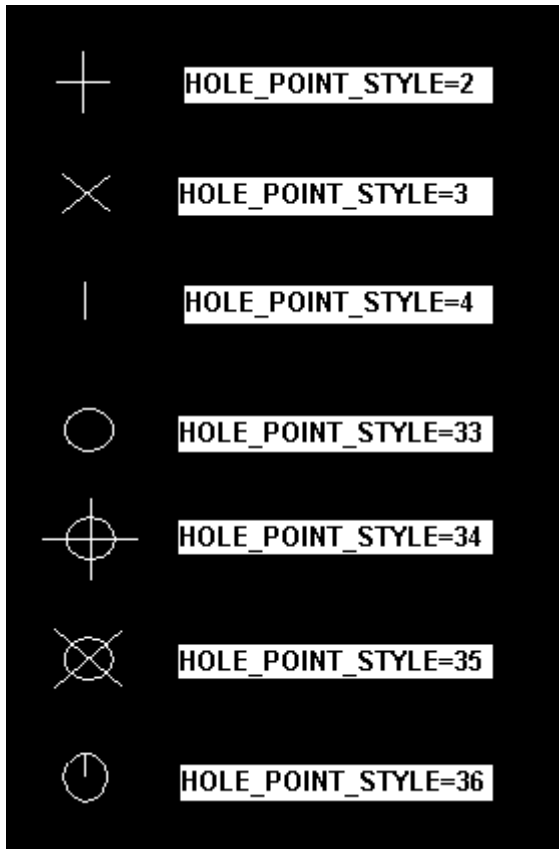
MAX_HOLE_DIAMETER_TO_POINTS=10.0

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.

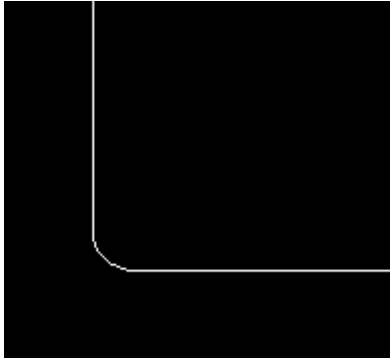
Use 1.0 to scale to metric units.

ADD_OUTER_CONTOUR_ROUNDINGS=FALSE

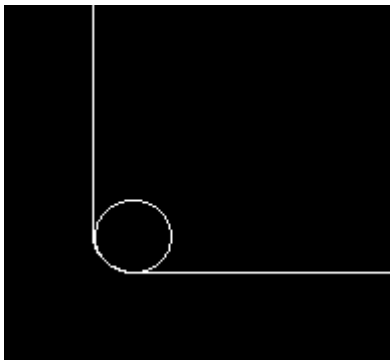
Add holes to roundings. This only affects the roundings that are created using the **Inner corners shape: 1** setting in the **NC file settings** dialog on the **Holes and cuts** tab. The hole size information is coming to the DSTV file from the **Radius** value in the **NC file settings** dialog, and 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`

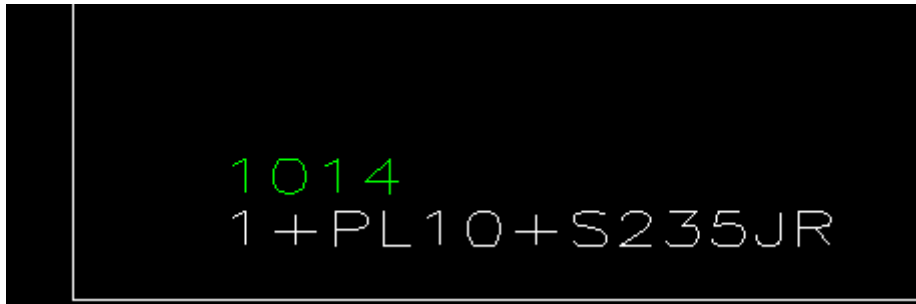
`PART_MARK_PREFIX=Part:`

`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

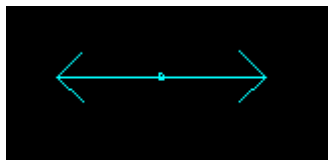
Slot layers [SLOT_LAYERS]

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.

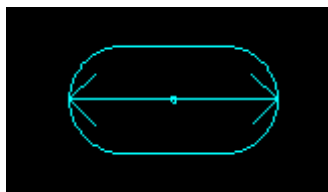
Layer Name	Min Dia m	Max Dia m	Min 'b'	Max 'b'	Min 'h'	Max 'h'	Type	Color	Phantom
13_16x1	20.62	20.65	4.75	4.78	0.0	0.02	3	3	PHANTOM_OUTLINE
13_16x1-7_8	20.62	20.65	26.97	26.99	0.0	0.02	3	3	PHANTOM_OUTLINE

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`

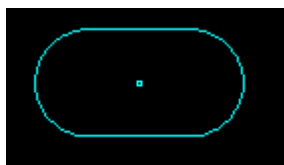
`PHANTOM_ARROW:`



`PHANTOM_BOTH:`



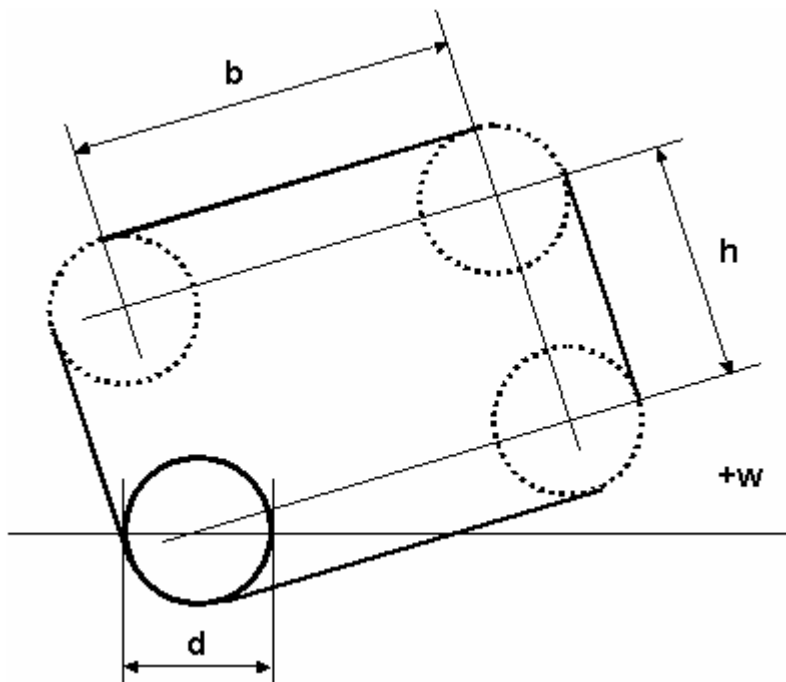
`PHANTOM_OUTLINE:`



`PHANTOM_NONE:`



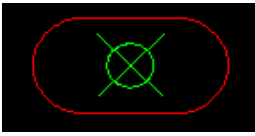
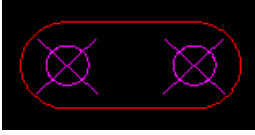
For an explanation of the “b” and “h” dimensions, see the image below:

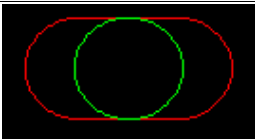
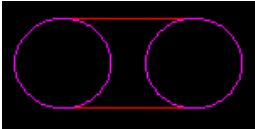
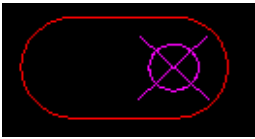
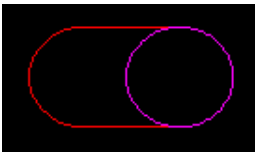
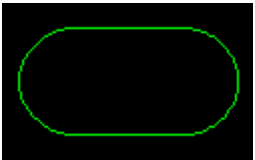


Examples of slot types

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 \(page 372\)](#)
- [bolts \(page 393\)](#)
- [rebars \(page 408\)](#)
- [applications and components \(page 419\)](#)

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.

In Tekla Warehouse, the offline catalog content is under **Tekla Structures collections**. To find this content, search for **Catalogs** and then select **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

- Timber
- Miscellaneous

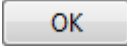
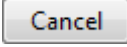
You cannot add, modify, or delete material types. Use the miscellaneous material type to define materials that do not have their own material type, such as aluminum, composites, glass, plastic, or stone.

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:

Button	Description
	Saves the changes of a single edited material grade to the computer's memory until you click 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 and then click OK in the Save confirmation dialog.
	Closes the Modify Material Catalog dialog 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. 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.
7. Click **OK** in the **Save confirmation** dialog 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.
7. Click **OK** in the **Save confirmation** dialog 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.
Tekla Structures asks if you want to save the changes to the model folder.
5. Click **OK** in the **Save confirmation** dialog 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.
5. Click **OK** in the **Save confirmation** dialog 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.
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. 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.

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	<code>user_material_symbols@1</code>	B
S235JRG2	<code>user_material_symbols@2</code>	C
S235JR	<code>user_material_symbols@0</code>	A
S275JR	<code>user_material_symbols@3</code>	D
S235JR	<code>user_material_symbols@4</code>	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.
6. Click **OK** in the **Save confirmation** dialog 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.
6. Click **OK** in the **Save confirmation** dialog to save the changes.

Import a material catalog

To add customized material catalogs to Tekla Structures, you can import a material catalog.

Before you begin, export the material catalog that you want to import, get the customized material catalog from the person who manages Tekla Structures for you, or download a material catalog from [Tekla Warehouse](#).

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.

By default, the material catalog contains standard, environment-specific materials. You do not need to import a material catalog to use these standard materials.

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 opens 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** checkbox, Tekla Structures uses the same action for all 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.
7. Click **OK** in the **Save confirmation** dialog 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

Type	Unit (if blank, no unit)
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 new profile catalog

The new profile catalog contains information about profiles, and the analysis and design properties of the profiles.

By default, the profile catalog contains standard profiles, environment-specific profiles, and generic parametric profiles. You can add, modify, import, export, and delete profiles, and organize profiles into groups. You can also [define your own profiles \(page 319\)](#).

Convert rules from the original profile catalog to groups in the new profile catalog

The new profile catalog uses groups to organize profiles instead of the rules that were used in the original profile catalog. The **Convert Rules to Groups** tool converts `rules.lis` and `profiles.lis` files to a `ProfileCatalog.Groups.xml` file for the new profile catalog.

1. From **Quick Launch**, open the **Convert Rules to Groups** tool.
2. If you want to convert only selected rules to groups, select the rules in the previous profile catalog.

- a. To open the previous profile catalog, search for `profile catalog` in **Quick Launch**.
 - b. Select the rules that you want to convert to groups.
3. Finish converting the rules to groups in one of these ways:
 - Click **Convert selected rules to groups** to convert only selected rules to groups.
 - Click **Convert all rules to groups** to convert all rules to groups.

The **Convert Rules to Groups** tool creates a file that contains the new group structure.

4. Copy the created file to one of these folders:
 - The folder defined by the XS_FIRM advanced option
 - The `profil\profiles` folder in the folder defined by the XS_PROFDB advanced option
 - The `<installation folder>\Environments\<environment>` folder on each user's computer

You can also copy files for groups and material types to the model folder.

5. Check the output to ensure that it is correct.

Filter and sort the profile catalog

You can filter the profile catalog to see only specific profiles. You can also sort the list of profiles according to the data in any column.

You can filter the profile catalog in these ways:

- To filter the profile catalog by a search term, enter the text in the filter box.
To clear the filter, click the X in the filter box.
- To filter the profile catalog by material type, select one or more material types on the ribbon of the **Profile catalog** dialog. The profile catalog shows profiles that match any of the selected material types.
- To sort the list of profiles by a column, click the column heading.

Show only fabricator profiles

When a fabricator shares their content using Tekla PowerFab, you can filter the profile catalog to show only profiles that are available from the fabricator.

Before you begin, configure the fabricator settings.

Showing only fabricator profiles ensures that there are no profiles in your Tekla Structures model that the fabricator does not have in their database. If

the fabricator makes changes to their settings, they are automatically updated in the profile catalog.

To show only fabricator profiles, select **Show only fabricator's profiles** on the ribbon of the **Profile catalog** dialog.

Create groups in the profile catalog

You can create your own custom groups to organize profiles in the profile catalog.

For example, you can create groups for the profiles that are used in a particular project so that they are easier to find.

1. On the **File** menu, click **Catalogs --> Profile catalog** to open the **Profile catalog** editing dialog.
2. On the ribbon of the **Profile catalog** dialog, click **New group**, then select **New group....**
3. In the **New group name** dialog, enter a unique name.

TIP You can change the name of the group later if needed.

4. Click **Create**. The new group is added to the list of groups.
5. To save the changes, click **Save**.

Next, do one of these tasks:

- For a finer level of organization in the group, create sub-groups in the group.
- Add profiles to the groups that you created.

Create sub-groups in the profile catalog

You can add sub-groups to groups in the profile catalog for a finer level of organization in the group.

1. On the **File** menu, click **Catalogs --> Profile catalog** to open the **Profile catalog** editing dialog.
2. Select an existing group.
3. On the ribbon of the **Profile catalog** dialog, click **New group**, then select **New sub-group**.
4. In the **New group name** dialog, enter a name.

The names of sub-groups do not have to be unique.

TIP You can change the name of the sub-group later if needed.

5. Click **Create**. The new sub-group is added to the selected group.

6. To save the changes, click **Save**.

Next, add profiles to the sub-groups that you created.

Add profiles to groups in the profile catalog

You can add different types of profiles to the same group. The same profile can belong to more than one group.

Profiles that do not belong to any group are shown in the **Ungrouped** group.

1. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Profile catalog** editing dialog.

2. Select one or more profiles.

To select multiple profiles, hold down **Ctrl** or **Shift** and click the profiles.

You can also use the selection options on the ribbon of the **Profile catalog** dialog to select multiple profiles:

- **Select all** selects all the profiles in the list.
- **Select none** clears the selection.
- **Invert selection** selects all but the previously selected profiles.

3. Move or copy the selected profiles to a group or sub-group.

- To move the profiles, drag the selected profiles to the group or sub-group. The profiles are added to the group or sub-group, and removed from their original location.
- To copy the profiles, hold down **Ctrl** and drag the selected profiles to the group or sub-group. The profiles are added to the group or sub-group without removing them from their original location.

4. To save the changes, click **Save**.

Remove profiles from groups in the profile catalog

Removing profiles from a group does not delete the profiles from the profile catalog. When you remove profiles from a group, the profiles stay in any other groups that they belong to.

If the profiles do not belong to any other groups, they are moved to the **Ungrouped** group.

You cannot use these steps to remove profiles from these groups:

- **Starred:** To remove profiles from this group, remove the star from the profiles.
- **Tags:** To remove profiles from this group, remove the tags from the profiles.
- **Ungrouped:** To remove profiles from this group, add the profiles to at least one group.

1. On the **File** menu, click **Catalogs --> Profile catalog** to open the **Profile catalog** editing dialog.
2. Select one or more profiles.
To select multiple profiles, hold down **Ctrl** or **Shift** and click the profiles.
You can also use the selection options on the ribbon of the **Profile catalog** dialog to select multiple profiles:
 - **Select all** selects all the profiles in the list.
 - **Select none** clears the selection.
 - **Invert selection** selects all but the previously selected profiles.
3. Right-click the selected profiles, then select **Remove from group**.
4. To save the changes, click **Save**.

Rename groups in the profile catalog

1. On the **File** menu, click **Catalogs --> Profile catalog** to open the **Profile catalog** editing dialog.
2. Right-click a group or sub-group, then select **Rename**.
3. Enter a unique name.
4. Click **Rename**.
5. To save the changes, click **Save**.

Share groups in the profile catalog

When you share groups, your local changes to the group definitions are shared with all users in the model. The shared group definitions are merged with the existing group definitions in the `ProfileCatalog.Groups.xml` file.

1. On the **File** menu, click **Catalogs --> Profile catalog** to open the **Profile catalog** editing dialog.
2. On the ribbon of the **Profile catalog** dialog, click **Share groups**.
A confirmation dialog opens.
3. To confirm that you want to share the groups, click **Share groups**.
An information dialog that shows that your local changes were shared successfully opens.
4. To close the information dialog, click **OK**.

Delete groups from the profile catalog

You can delete only the group, or you can delete both the group and the profiles that it contains.

If you delete only the group, the profiles in the group are moved to the **Ungrouped** group. If you delete both the group and the profiles that it contains, the profiles are deleted from the profile catalog.

When you delete profiles from the profile catalog, they are permanently deleted.

1. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Profile catalog** editing dialog.
2. Right-click a group or sub-group, then select one of the following options:
 - To delete only the group or sub-group, select **Delete**.
 - To delete both the group or sub-group and the profiles that it contains, select **Delete group and profiles**.
3. To confirm the deletion, click **Yes**.
4. To save the changes, click **Save**.

Add tags to profiles in the profile catalog

You can add custom tags to profiles to make them easier to find and organize. Profiles that have the same tag are automatically grouped into tag-based groups.

1. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Profile catalog** editing dialog.
2. Select one or more profiles.

To select multiple profiles, hold down **Ctrl** or **Shift** and click the profiles.

You can also use the selection options on the ribbon of the **Profile catalog** dialog to select multiple profiles:

 - **Select all** selects all the profiles in the list.
 - **Select none** clears the selection.
 - **Invert selection** selects all but the previously selected profiles.
3. In the pane on the right, enter the tag in the **Tags** box.

If the tag did not previously exist, a new tag-based group appears in the list of groups. The selected profiles are added to the tag-based group.
4. To save the changes, click **Save**.

Add stars to profiles in the profile catalog

1. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Profile catalog** editing dialog.
2. In the **Star** column, click the star icon for a profile.

The profile is added to the **Starred** group.

3. To save the changes, click **Save**.

Rename profiles in the profile catalog

1. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Profile catalog** editing dialog.
2. Select a profile.
3. In the pane on the right, click the edit button next to the **Profile name** box.
4. In the **Profile name** box, enter a new name.
The profile name must be unique and must not contain spaces.
5. To save the name, click the check mark.
6. To save the changes, click **Save**.

Add or edit user-defined attributes for profiles

You can add your own user-defined attributes (UDAs) to profiles or edit the existing attributes.

1. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Profile catalog** editing dialog.
2. Select a profile.
3. On the **User attributes** tab, click **Definitions**.
The **Modify Profile Properties** dialog opens.
4. To add a new row, click **Add**.
5. To define the user attribute, click each item on a row and define the settings.

Item	Explanation
Profile type	Select the profile type to which the user attribute is applied.
Quantity type	Select the type of information that the user attribute contains, for example, weight, area, ratio, or string.
Order	Enter a whole number to define the order in which the user attributes are shown in the dialog. You can enter positive or negative numbers. Attributes with the smallest values are shown first. If several attributes have the same value, they are shown in alphabetical order by the Label .

Item	Explanation
Property name	Enter 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, <code>PROFILE.PROPERTY_NAME</code> indicates where the property name appears. For example, <code>PAINT_LAYER_THICKNESS</code> .
Symbol	Enter an abbreviation for the property, such as <code>Ix</code> or <code>ct</code> .
Label	Enter a label for the attribute. This label is shown in the profile properties.

6. Click **Update**.
7. Click **OK** to close the **Modify Profile Properties** dialog.

Delete profiles from the profile catalog

When you delete profiles from the profile catalog, they are permanently deleted.

1. On the **File** menu, click **Catalogs --> Profile catalog** to open the **Profile catalog** editing dialog.
2. Select one or more profiles.
To select multiple profiles, hold down **Ctrl** or **Shift** and click the profiles.
You can also use the selection options on the ribbon of the **Profile catalog** dialog to select multiple profiles:
 - **Select all** selects all the profiles in the list.
 - **Select none** clears the selection.
 - **Invert selection** selects all but the previously selected profiles.
3. Right-click the selected profiles, then select **Delete profiles**.
4. To save the changes, click **Save**.

Find issues in the profile catalog using profile database inspection

Profile database inspection finds issues in the profile database and creates log files that list the issues.

These issues include:

- Profiles that are not valid
- Duplicate profiles
- Profiles with names that contain spaces

Profile database inspection also lists all CLB profiles and sketched profiles.

1. To start profile database inspection, search for **Run profile database inspection** in **Quick Launch**.

Profile database inspection searches the profile database for issues and writes a list of issues in the log files in the `ExportedProfiles` folder under the model folder.

- Fixed profiles that have issues are listed in the `FixedProfileItems_<Environment>_<Role>[_<ModelName>].info` file.
- Hardcoded parametric profiles that have issues are listed in the `HardCodedProfileItems_<Environment>_<Role>[_<ModelName>].info` file.
- All other profiles that have issues are listed in the `ProfileItems_<Environment>_<Role>[_<ModelName>].info` file.

2. To view the list of issues, open the file in a text editor, such as notepad.

Import and export profiles in the new profile catalog

Import and export profiles to reuse, combine, and share profiles between different profile catalogs.

Importing and exporting helps you to:

- Reuse a customized profile catalog from a previous version when you upgrade to a newer version of Tekla Structures
- Combine profile catalogs that are stored in different locations
- Share profile catalog information with other users
- Combine profile catalogs across different environments.

TIP You can also download or share profiles using Tekla Warehouse.

About importing and exporting 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 `.uel` file into the

same or newer version of Tekla Structures. You cannot import a .uel file from a newer version into an older version.

TIP To automatically import all .uel files from a folder when creating a new model, use the advanced option .

Import profiles

Import profiles to make profiles from one profile catalog available in another profile catalog.

You can import profiles from the new profile catalog or the original profile catalog.

You can import these types of files from the original profile catalog:

- `profiles.lis`: for fixed profiles
- `.uel`: for sketched profiles
- `.clb`: for user-defined parametric profiles.

You cannot import `rules.lis` files from the original profile catalog into the new profile catalog because the new profile catalog uses groups instead of rules to organize profiles. To convert `rules.lis` files to groups in the new profile catalog, use the [tool \(page 293\)](#).

1. On the **File** menu, click **Catalogs --> Profile catalog** to open the **Modify Profile Catalog** dialog box.
2. On the ribbon of the **Profile catalog** dialog, click **Import**.
3. Browse to the location of the file that you want to import.
4. In the **Review import items** dialog, change the action for any profiles that you do not want to import. By default, all rows have the **Import** action. When you use the **Import** action, the profile in the import file replaces the existing profile if the same profile is already in the profile catalog.
 - a. Select the row for one or more profiles.
To select multiple rows, hold down **Ctrl** or **Shift** and click the rows.
 - b. Click one of these buttons to select the action for the selected rows:
 - **Do not import**: The profile in the import file is ignored. The profile that already exists in the profile catalog is not changed.
 - **Merge**: The properties of the profile in the import file are merged with the properties of the existing profile in the profile catalog.
 - c. After you have selected the action for all rows that you want to change, click **Import**.
5. To close the dialog, click **Close**.

If the profiles that you imported have a group structure, the profiles appear in the groups to which they belong. If the groups do not already exist, they are created.

If the profiles that you imported do not have a group structure, they appear in the **Ungrouped** group.

6. To save the changes, click **Save**.

Import groups

Import groups to make the group structure from one profile catalog available in another profile catalog.

Before you begin, you must have an exported group structure.

1. On the **File** menu, click **Catalogs --> Profile catalog** to open the **Modify Profile Catalog** dialog box.
2. On the ribbon of the **Profile catalog** dialog, click **Import**.
3. Browse to the location of the file that you want to import.
4. Click **Open**.
5. To close the dialog, click **Close**.
6. To save the changes, click **Save**.

Next, add profiles to the groups.

Insert profiles and groups from Tekla Warehouse into the model

You can insert profiles and groups directly from Tekla Warehouse into the new profile catalog.

For more information, see [Insert Tekla Warehouse content into a Tekla Structures model](#).

Export selected profiles

To make individual profiles available in another profile catalog, select and export the profiles.

Individual profiles are exported as .profilecatalog files.

1. On the **File** menu, click **Catalogs --> Profile catalog** to open the **Modify Profile Catalog** dialog box.
2. Select one or more profiles.

To select multiple profiles, hold down **Ctrl** or **Shift** and click the profiles.

You can also use the selection options on the ribbon of the **Profile catalog** dialog to select multiple profiles:

- **Select all** selects all the profiles in the list.
- **Select none** clears the selection.
- **Invert selection** selects all but the previously selected profiles.

3. Right-click the selected profiles, then select one of these options:
 - **Export:** Only the selected profiles are exported.
 - **Export with group:** The selected profiles and their group structure are exported. When the profiles are imported into another profile catalog, they appear in the groups to which they belong. If the groups do not already exist, they are created.
4. Browse to the location where you want to save the export file.
5. Enter a name for the file, then click **Save**.
6. To finish the export, do one of the following:
 - To open the folder that contains the exported files, click **Open folder**.
 - To close the dialog, click **Close**.

Export all profiles in a group

To make a group of profiles available in another profile catalog, export all profiles in the group.

Profiles in groups are exported as `.profilecatalog` files.

1. On the **File** menu, click **Catalogs --> Profile catalog** to open the **Modify Profile Catalog** dialog box.
2. Right-click a group, then select one of these options:
 - **Export profiles:** Only the profiles are exported.
 - **Export profiles with group:** The profiles and the group structure are exported. When the profiles are imported into another profile catalog, they appear in the groups to which they belong. If the groups do not already exist, they are created.
3. Browse to the location where you want to save the export file.
4. Enter a name for the file, then click **Save**.
5. To finish the export, do one of the following:
 - To open the folder that contains the exported files, click **Open folder**.
 - To close the dialog, click **Close**.

Export all profiles in the profile catalog

To share all profiles in the profile catalog, export the whole profile catalog.

Profile catalogs are exported as `.profilecatalog` files.

1. On the **File** menu, click **Catalogs --> Profile catalog** to open the **Modify Profile Catalog** dialog box.
2. In the ribbon of the **Profile catalog** dialog, click **Export**, then select one of these options:
 - **Export all profiles:** Only the profiles are exported.

- **Export all profiles with groups:** The profiles and the group structure are exported. When the profiles are imported into another profile catalog, they appear in the groups to which they belong. If the groups do not already exist, they are created.
3. Browse to the location where you want to save the export file.
 4. Enter a name for the file, then click **Save**.
 5. To finish the export, do one of the following:
 - To open the folder that contains the exported files, click **Open folder**.
 - To close the dialog, click **Close**.

Export group structures

Export groups to make the group structure from one profile catalog available in another profile catalog. You can also export group structures to prepare for localization.

Group structures are exported as `.ProfileCatalog.Groups.xml` files.

1. On the **File** menu, click **Catalogs --> Profile catalog** to open the **Modify Profile Catalog** dialog box.
2. Export the group structure in one of these ways:
 - To export the group structure for all groups in the profile catalog, click **Export** in the ribbon of the **Profile catalog** dialog, then select **Export group structure only**.
 - To export the group structure for a single group, right-click the group, then select **Export selected group structure only**.
3. Browse to the location where you want to save the export file.
4. Enter a name for the file, then click **Save**.
5. To finish the export, do one of the following:
 - To open the folder that contains the exported files, click **Open folder**.
 - To close the dialog, click **Close**.

Only the groups and their sub-groups are exported.

If you want to use the exported `.ProfileCatalog.Groups.xml` file for localization, we recommend that you copy the file to the environment or firm folder.

Upload profiles and groups from a model to Tekla Warehouse

You can upload profiles and groups directly from the new profile catalog to Tekla Warehouse.

For more information, see [Upload content from a Tekla Structures model](#).

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	

Customize the original profile catalog

The original 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 profiles, environment-specific profiles and generic parametric profiles. You can add, modify, import, export, and delete profiles. You can also [define your own profiles \(page 319\)](#).

Tekla Structures stores the profile catalog information in the `profdb.bin` file.

Re-enable the original profile catalog

The new profile catalog is enabled by default in the Default environment, and it might also be enabled in other environments. If you want to continue using the original profile catalog in an environment where the new profile catalog is enabled, you must re-enable the original profile catalog.

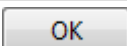
To use the original profile catalog, add `set XS_USE_OLD_PROFILE_CATALOG=true` to one of these files:

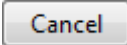
- The `env_global_default.ini` file in the `Environments\common` folder
- The `env_<EnvironmentName>_environment.ini` file in a specific environment folder.

TIP To open the original profile catalog without enabling it, search for **Profile catalog** in **Quick Launch**.

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:

Button	Description
	Saves the changes of a single edited profile to the computer's memory until you click 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 and then click OK in the Save confirmation dialog.

Button	Description
	Closes the Modify Profile Catalog dialog 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. 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 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.
5. Click **OK** to close the **Modify Profile Catalog** dialog.
6. Click **OK** in the **Save confirmation** dialog 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 appears.
3. Modify the rule properties.
4. Click **OK** to close the **Profile manager rules** dialog.
5. Click **OK** to close the **Modify Profile Catalog** dialog.
6. Click **OK** in the **Save confirmation** dialog 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 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. 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.

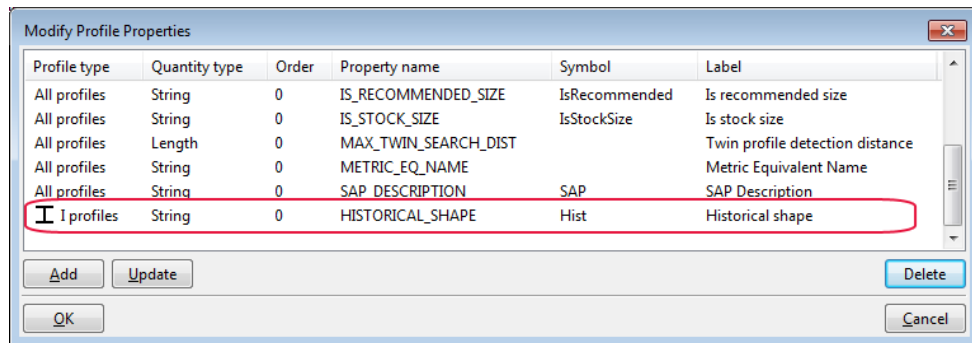
Example: Add a user attribute to a profile and use it in a rule

You can add your own attributes and their values to profiles. The user attributes can then be used, for example, in profile filtering.

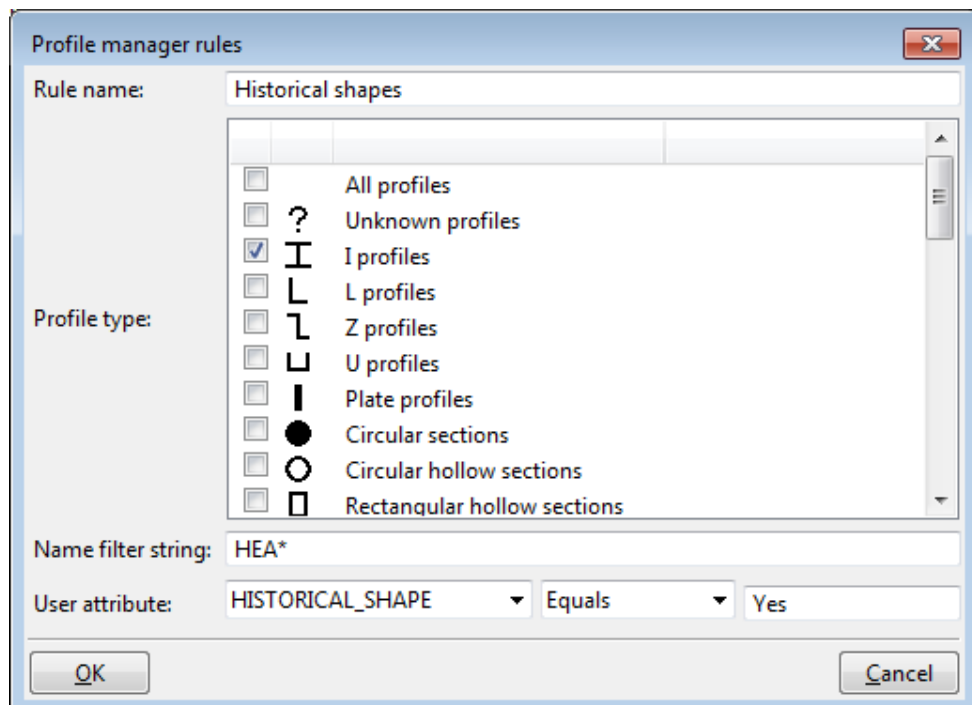
This example shows how to add a user attribute for the rule for I profiles.

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 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, set the rule properties as follows:
 - Set **Rule name** to Historical profiles.
 - In **Profile type**, clear the **All profiles** checkbox and select the **I profiles** checkbox.
 - 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**.

General Analysis User attributes			
Property	Symbol	Value	Unit
SAP Description	SAP		
Metric Equivalent Name			
Twin profile detection distance		0.00	mm
Is stock size	IsStockSize		
Is recommended size	IsRecommended		
Historical shape	Hist	Yes	
List of factories	FactoryList		
Design order		0	

11. Click **Update**.
12. Click **OK** to close the **Modify Profile Catalog** dialog.
13. Click **OK** in the **Save confirmation** dialog to save the changes.

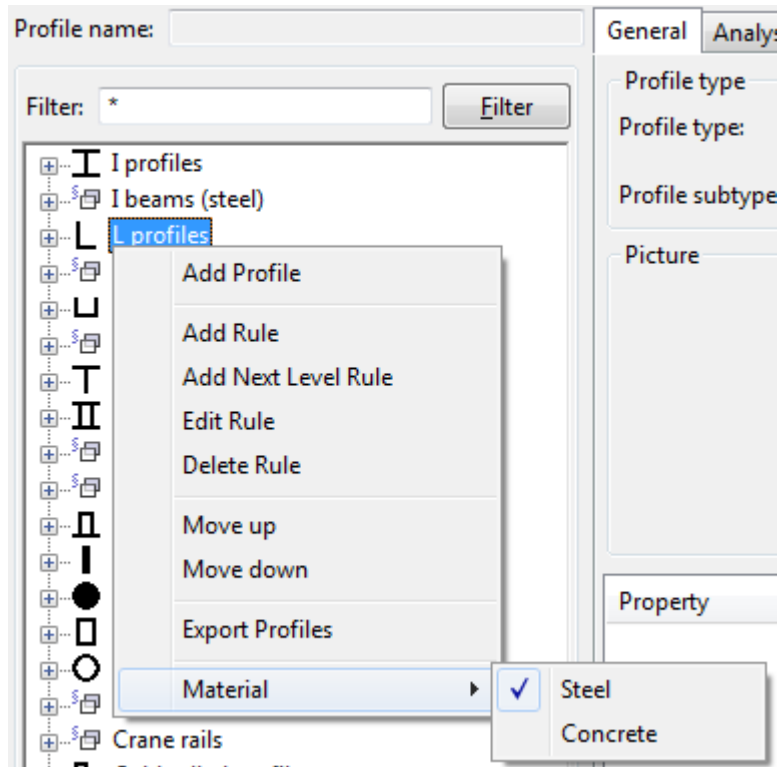
The next time that you open the profile catalog, the profiles appear under **Historical profiles** in the profile tree.

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 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.
6. Click **OK** in the **Save confirmation** dialog 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.
5. Click **OK** in the **Save confirmation** dialog 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 in the original profile catalog

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 a fixed profile uses a sketched profile or a user-defined parametric profile as the cross section, you must also import the sketched profile or the parametric profile.

TIP You can also download or share profiles using Tekla Warehouse.

About importing and exporting 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 `.uel` file into the

same or newer version of Tekla Structures. You cannot import a .uel file from a newer version into an older version.

TIP To automatically import all .uel files from a folder when creating a new model, use the advanced option .

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 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.
7. Click **OK** in the **Save confirmation** dialog 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.

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.

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

Type	Unit (if blank, no unit)
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	

Create your own profiles

You can create your own fixed or parametric profiles.

Use the profile catalog to create new fixed profiles. Use the sketch editor or .clb files to create new parametric profiles.

Use any of the following methods to create your own profiles:

Profile type	Creation methods
Fixed profile	• Create user-defined cross sections in profiles (page 319) • Create a fixed profile (page 330) • Create a fixed profile by copying an existing profile (page 332) • Create a fixed profile based on a parametric profile (page 333)
Parametric profile	• Create parametric profiles using .clb files (page 334) • Create parametric profiles by sketching (page 341)
Parametric profile with variable cross sections	• Create parametric profiles with variable cross sections (page 367)

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.

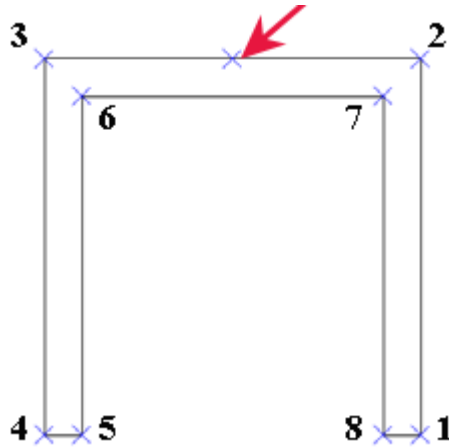
Define a cross section without inner contours using a polygon

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. Then, 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.



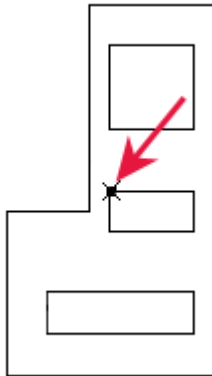
5. In the **User Profile Cross Section** dialog, enter a name for the cross section.
6. Click **OK** to close the **User Profile Cross Section** dialog.
7. Click **OK** in the **Save confirmation** dialog to save the changes.
8. Use this cross section when you add a new profile to the profile catalog.
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.

- Pick the center point of the cross section.



- In the **User Profile Cross Section** dialog, enter a name for the cross section.
- Click **OK** to close the **User Profile Cross Section** dialog.
- Click **OK** in the **Save confirmation** dialog 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.

- Create a contour plate that includes all the chamfers.
- On the **File** menu, click **Catalogs --> Define profiles --> Define cross section using plate**.
- On the **Parameters** tab of the **Profile Cross-Section from Plate (10)** dialog, enter a name in the **Section name** and **Profile name** fields.
Other properties are optional.
- Click **OK**.
- Select the contour plate.
Tekla Structures creates the cross section with the shape of the contour plate.
- Use the **Parameters** tab to define the profile properties in the **Profile cross-section from plate (10)** component.

**Properties:
Profile cross-
section from
plate (10)**

Option	Description
Section name	Name of the cross section shown in the Modify Profile Catalog dialog. 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. 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 • Mirror to x- and y-direction

7. Use this cross section when you add a new profile to the profile catalog.
The **Profile type** is **User-defined, fixed**.

Prepare a DWG file to convert to a profile

Before you import a cross section from a .dwg file into the profile catalog, prepare the DWG file so that it can be imported into Tekla Structures correctly.

Tekla Structures supports DWG files that have been created using version ACAD2012 or earlier.

1. Ensure that only the lines of the profile shape that you want to convert to a profile are visible.

Additional objects, such as text, dimensions, XREF objects, or leader lines, must not be visible.

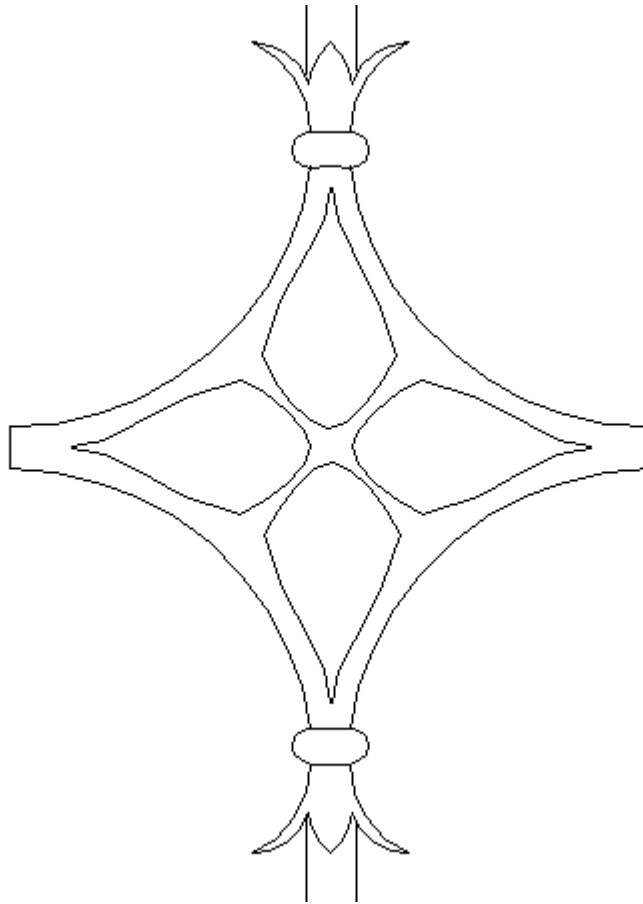
- To prevent additional objects from being visible, we recommend that you delete the additional objects.
- You can also turn off the layers that contain the additional objects. However, when you [scale up the profile](#) before the import process, most of the objects will no longer be aligned the same way as in the original DWG file.

2. Remove hatching and unnecessary lines.

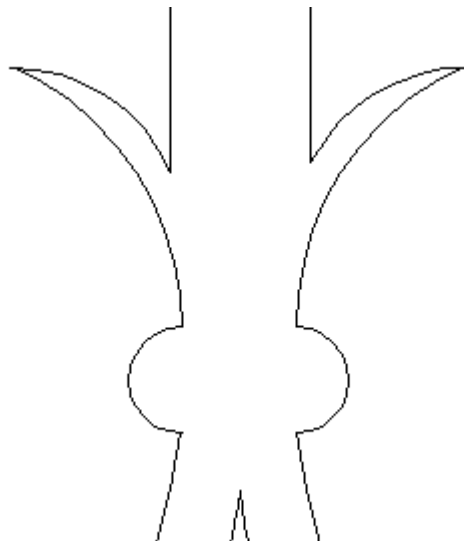
Tekla Structures imports all the lines it finds in the DWG file.

Profiles are defined by outlines: the outer shape is the overall profile and any internal shapes are holes in the profile. For the profile to be imported correctly, there cannot be any internal lines that do not represent a hole.

This example shows an ornamental handrail. The four internal shapes will be created correctly:



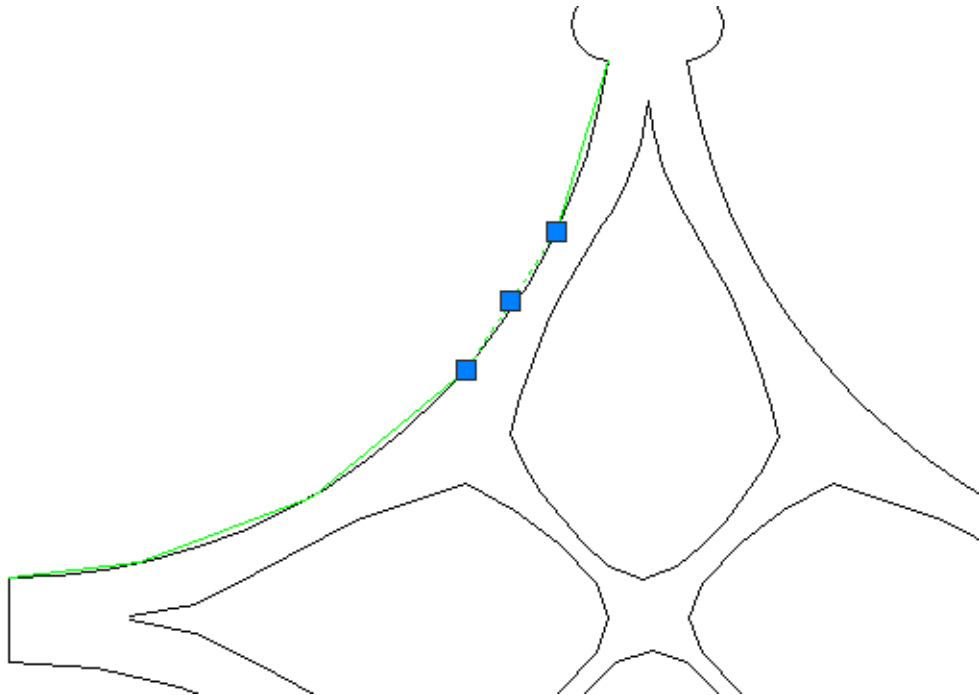
But the lines above and below them that add more detail to the shape will not work. These additional lines must be removed:



3. Ensure that your profile only includes basic objects that make up the profile shape.

The profile can include lines, arcs, and circles. Other shapes, such as splines, polylines, and regions, are not imported to Tekla Structures correctly. If your profile includes these shapes, the shapes must be exploded.

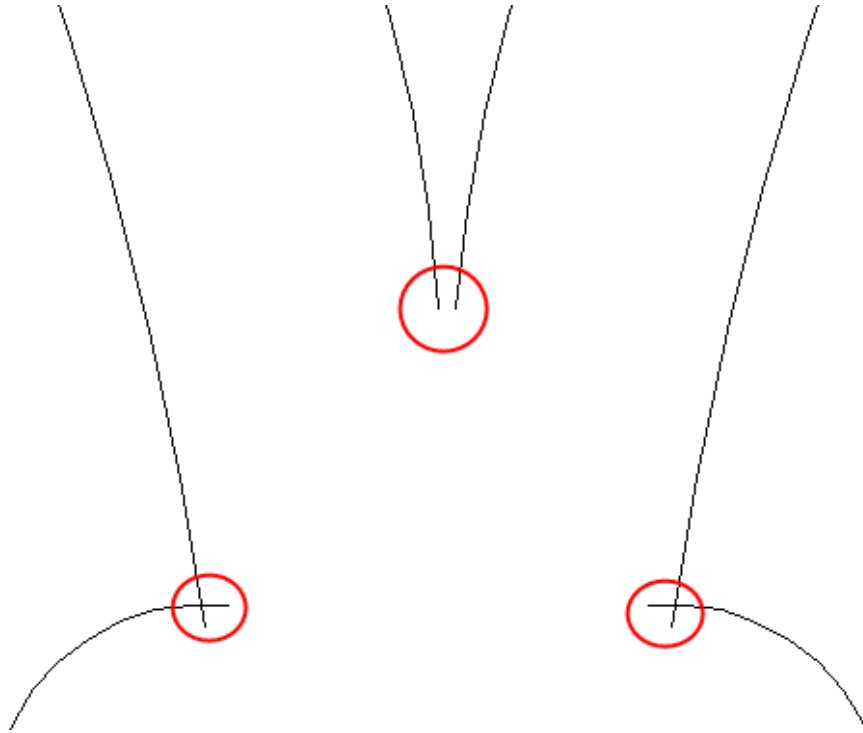
When arcs are imported, Tekla Structures converts the arcs to segmented curves. If there are too many facets along the curve, the profile might be distorted when it is imported. To reduce the number of facets along the curve, remove complex arcs and draw simple lines to indicate the curve instead.



Trace over the arc using the line tool, then delete the arc.

4. Ensure that the outline consists of only one closed polyline.

Each outline must close completely, with no gaps, overlaps, or other inconsistencies. Use the trim and extend tools to close the shapes.

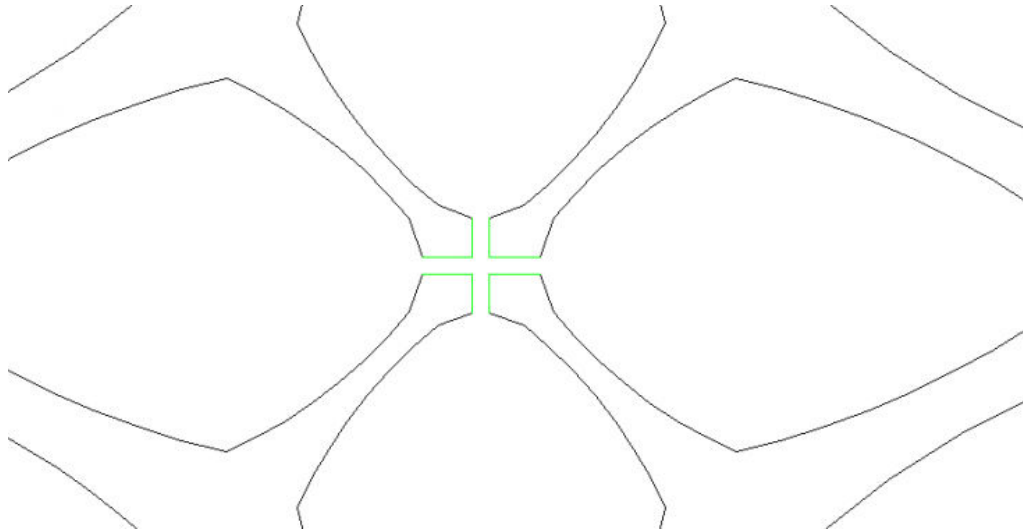


Especially with third-party DWG files, it might be more efficient to clean up one section of the profile, then copy or mirror it to similar or symmetrical areas.

TIP You can use the Region function in AutoCAD to test the integrity of the profile. If all the lines form a closed shape, AutoCAD creates a region. If the shape is not closed, a region is not created. After testing, explode the region. Regions are cannot be imported into Tekla Structures.

5. If your profile has more than 10 regions, join them together using small gaps to make several outlines into one larger shape.

When converting a DWG file to a profile, the shape is limited to 10 closed outlines or regions: the overall profile shape plus nine openings.



6. [Scale up the profile](#) by 25.4 so that it measures correctly in a Tekla Structures model.

Tekla Structures works in metric, so when you import a DWG file that is being converted to a profile, the metric conversion must be taken into account.

7. Save the outline of the cross section as a DWG file.

Define a cross section using a DWG file

After you have prepared the .dwg file to use as a cross section, you can import the cross section into the profile catalog as a DWG profile.

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, browse for the DWG file.

The filename path for the DWG file can have a maximum length of 255 characters.

4. Define the cross section properties.

Option	Description
Section name	Name of the cross section shown in the Modify Profile Catalog dialog.
Profile name	Name of the profile shown in the Modify Profile Catalog dialog.

Option	Description
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.

5. Do not change the default values on the **Profile attributes** tab.

The **Profile attributes** defines information about the profile that is shown on the **General** tab in the profile catalog. We recommend that you do not change the default values unless you are sure of the values. If the values on this tab conflict with the actual shape, the import might not work correctly.

6. Click **OK**.

7. 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.

The profile is automatically added to your profile catalog. The profile might not be visible in the profile catalog until you close the model and open it again. The **Profile type** is **User-defined, fixed**.

8. If the profile is not shown in the profile catalog, or the profile is not converted as expected, edit the DWG file and import the profile again.

You might have to repeat this process several times before the profile is converted as expected.

Possible problems:

- Too many arcs: Trace over the arcs using the line tool, then delete the arcs to reduce the number of facets.

- Radii that are too small: Very small curves might not be converted correctly. Replace small curves with straight line segments.
- Lines on top of lines: Remove additional lines.
- Gaps or overlapping intersections: Use the trim and extend tools to close the shapes.

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, 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.
 - **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.
6. Click **OK** in the **Save confirmation** dialog to save the changes.

Create fixed profiles in the original profile catalog

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.

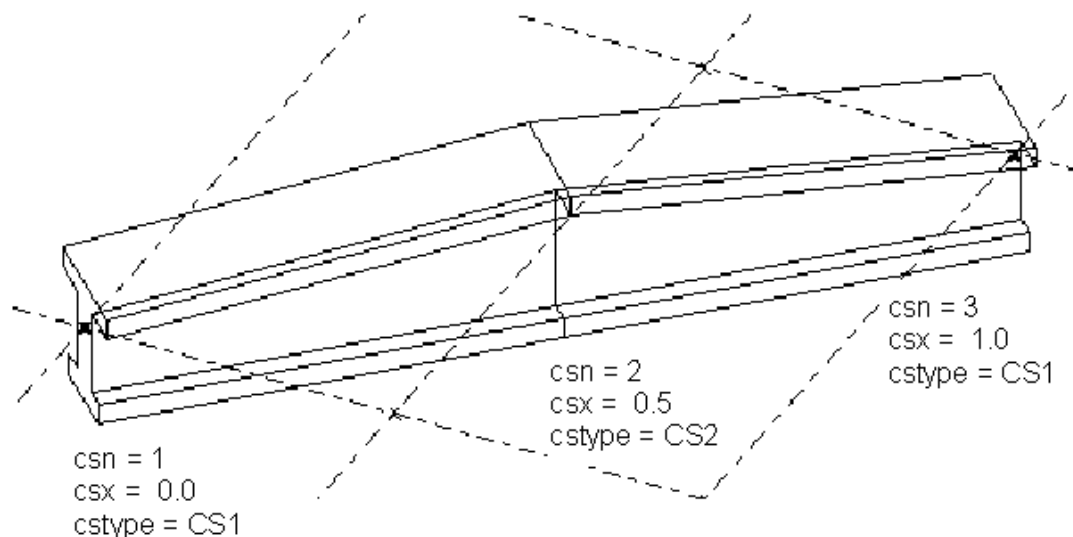
1. On the **File** menu, click **Catalogs --> Profile catalog** to open the **Modify Profile Catalog** dialog box.
2. Right-click anywhere in the list of profiles, then select **Add Profile**.
A new fixed profile with the name **PROFILE1** is created.
3. Define the properties of the profile.
 - a. In 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 \(page 319\)](#), 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. (Original profile catalog only) 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. (Original profile catalog only) 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. Save the changes to the profile catalog.

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. (Original profile catalog only) Click **Update**.
 7. Save the changes to the profile catalog.

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.

NOTE The fixed profiles conform to industry standards. Only administrators should modify them.

You can use these tabs to modify different types of information about fixed profiles:

- 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-defined attributes for profiles.
1. On the **File** menu, click **Catalogs --> Profile catalog** to open the **Modify Profile Catalog** dialog box.
 2. Select a fixed profile  to modify its properties.
 3. (Original profile catalog only) When you have finished modifying the profile, click **Update**.
 4. Save the changes to the profile catalog.

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 using .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\profil 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\profil 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 shown in the **Modify Profile Catalog** dialog. When you create a new parametric profile, you must add the profile definitions, such as the profile type, prefix and the unit of measurement, to the profitab.inp file. The profitab.inp file is in the environment folder in ..\ProgramData\Trimble\Tekla Structures\<version>\environments\<environment>\. The exact

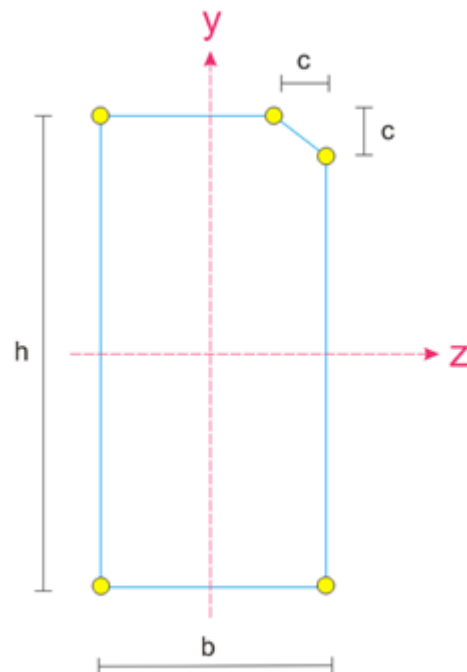
file location might vary depending on the folder structure of your environment files .

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 or in a graphing application.

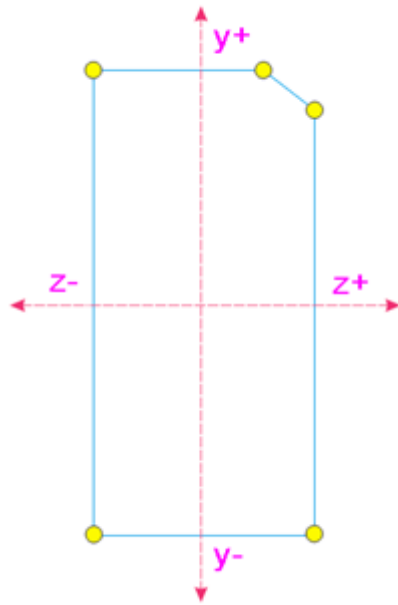
1. Design the profile on paper or in a graphing application.
 - a. Draw the cross section outline.
 - b. Add the corner points.
 - c. Add the dimensions.
 - d. Place the y-z coordinate axis center point in the middle of the cross section.



2. Define the y and z coordinate directions.

For example:

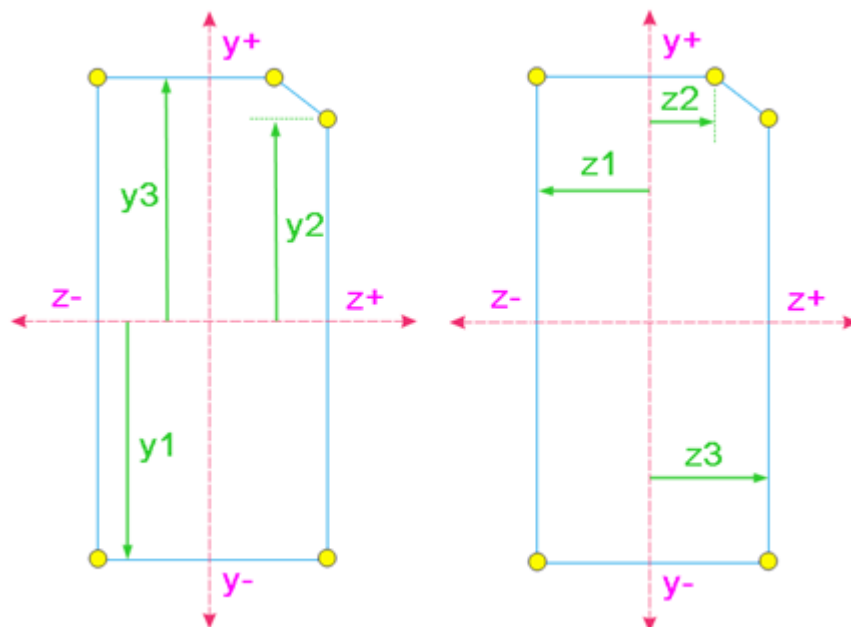
- positive y axis: up
- negative y axis: down
- positive z axis: on the right
- negative z axis: on the left



3. Define the y and z vectors.

For example:

- y_1, y_2, y_3
- z_1, z_2, z_3

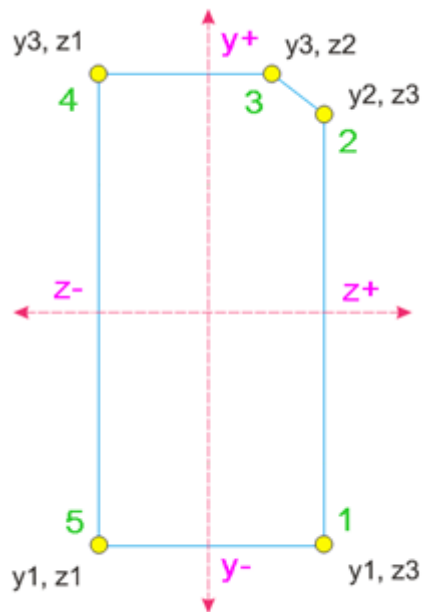


4. Make coordinate pairs for the points.

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\profil folder.
8. In a text editor, open the components.clb file.
9. Add the following line to the components.clb file to add your profile definition:

```
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.
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.

Property	Description
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.
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.

To create parametric profiles by sketching, do these tasks in the order shown here:

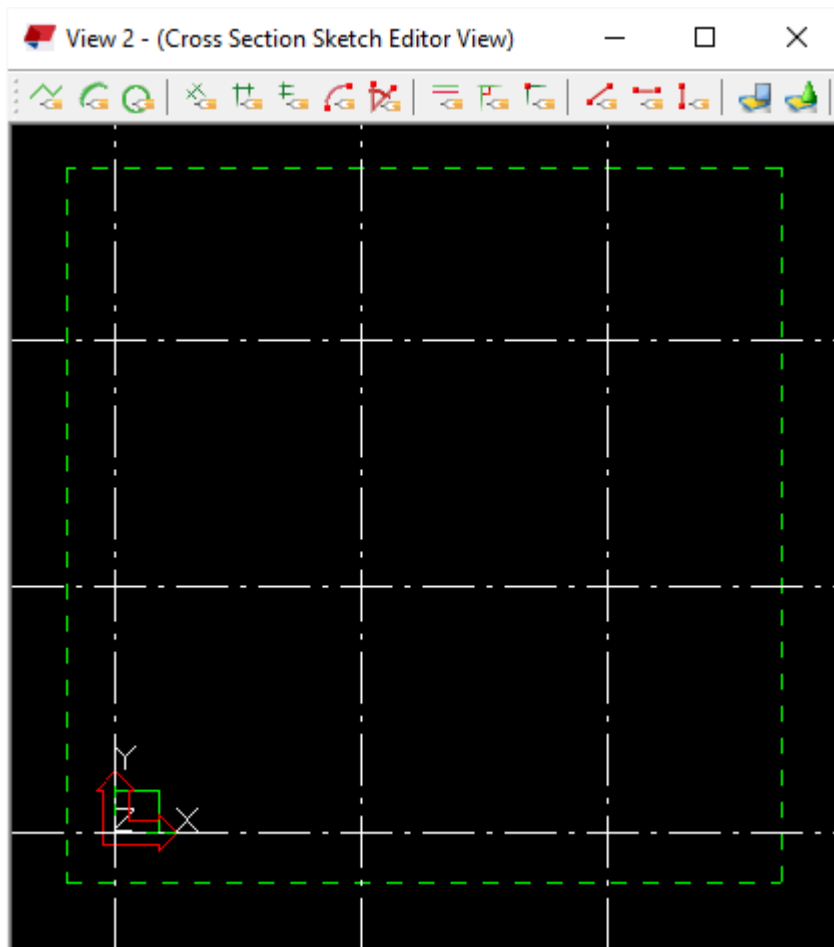
- Sketch the outline of a profile
- Refine the shape of a sketched profile by adding a constraint
- Add dimensions to a sketched profile
- Define positioning planes for a sketched profile
- [Check a sketched profile \(page 358\)](#)
- [Save a sketched profile \(page 358\)](#)
- [Use sketched profiles in a model \(page 359\)](#)
- Modify sketched profiles
- Example: Create a symmetric C-shaped profile by sketching

To get started, [sketch the outline of the profile \(page 344\)](#).

About the sketch editor

Use the cross section sketch editor to create and modify sketched profiles.

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.



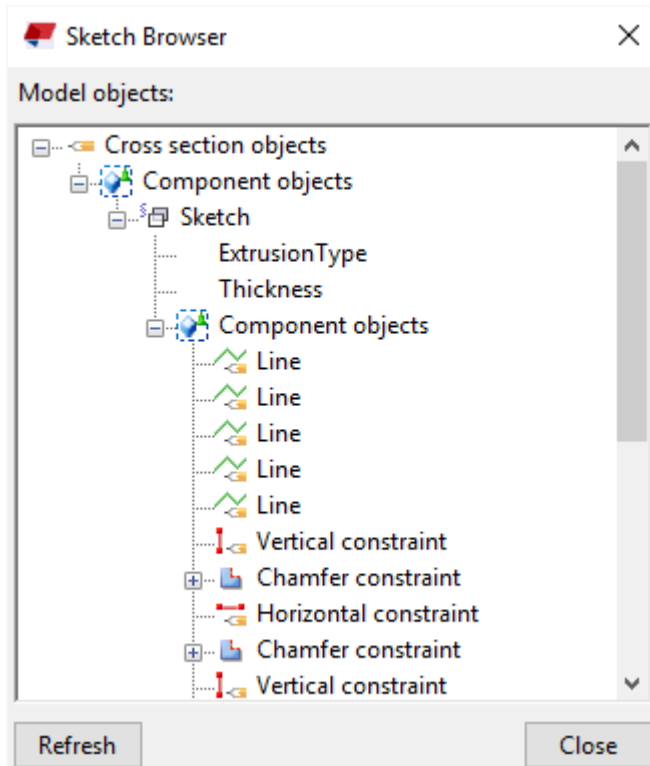
When you open the sketch editor, Tekla Structures also opens the **Sketch Browser** and the **Variables** dialog.

About the Sketch Browser

The **Sketch Browser** shows the objects (lines, arcs, circles, constraints, dimensions, and chamfers) of a sketched profile in a hierarchical, tree 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**.



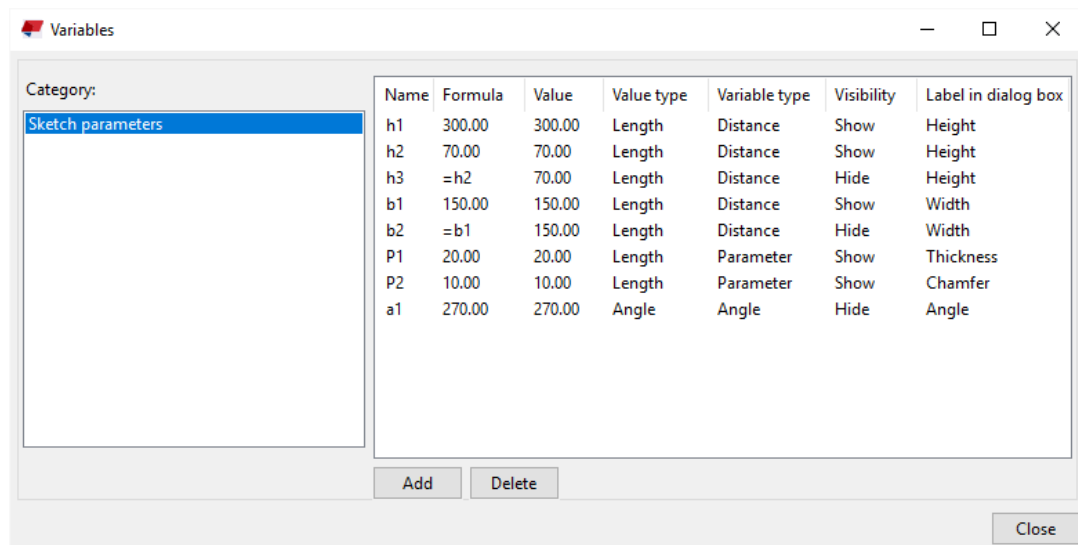
The **Sketch Browser** shows the following information about each sketched profile:

- 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 to define the properties of a sketched profile. The **Variables** dialog automatically opens when you open the sketch editor.



NOTE The **Variables** dialog functions the same way as the corresponding dialog 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

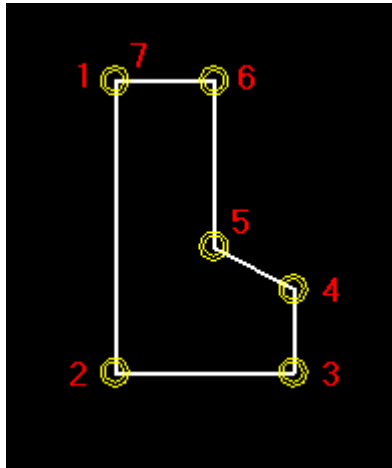
When you create a new sketched profile, start by sketching the outline and the holes of the profile using lines, arcs, and circles.

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.

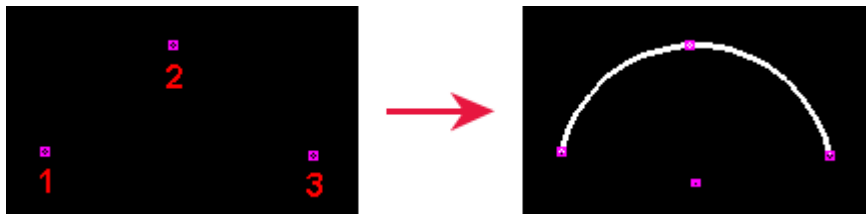
1. Open a Tekla Structures model.
2. On the **File** menu, click **Editors --> Define cross section in sketch editor**. Tekla Structures opens the sketch editor, the **Sketch Browser**, and the **Variables** dialog.
3. Click the **Sketch polyline** button: .
4. Pick points to create each line segment.
5. 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 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.
3. Click the **Sketch arc** button: .
4. Pick three points to define the arc.



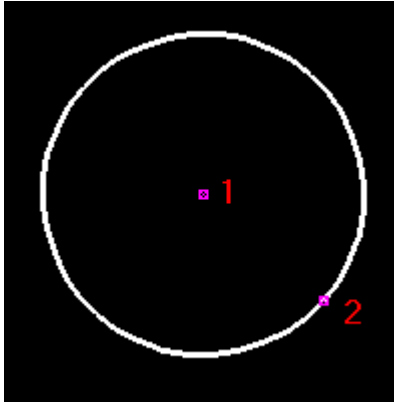
TIP You can use the advanced option XS_CS_CHAMFER_DIVIDE_ANGLE to define the smoothness of the arc.

Sketch a circle

You can create a circle in the sketch editor by picking two points.

1. Open 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.
3. Click the **Sketch circle** button: .
4. Pick a point to indicate the center of the circle (**1**).

5. Pick a point to indicate the radius of the circle **(2)**.



What to do next

Next, [refine the shape of the sketched profile by adding a constraint \(page 346\)](#).

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.

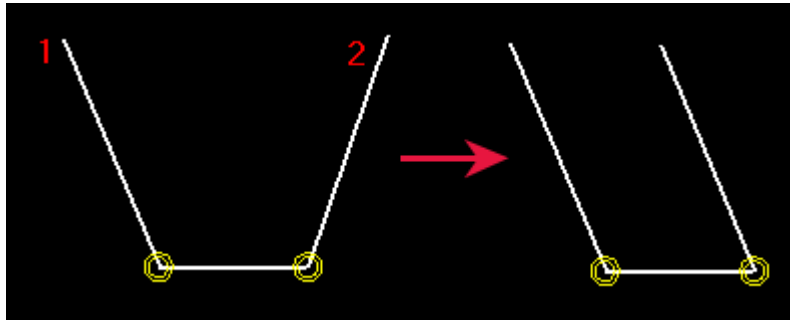
Before you begin

Before you begin, [sketch the outline of the profile in the sketch editor \(page 344\)](#).

Add a parallel constraint

You can use a parallel constraint to force two lines in a sketched profile to be parallel to each other.

1. Click the **Parallel constraint** button: .
2. Select a line in the sketch **(1)**.
3. Select another line in the sketch **(2)**.

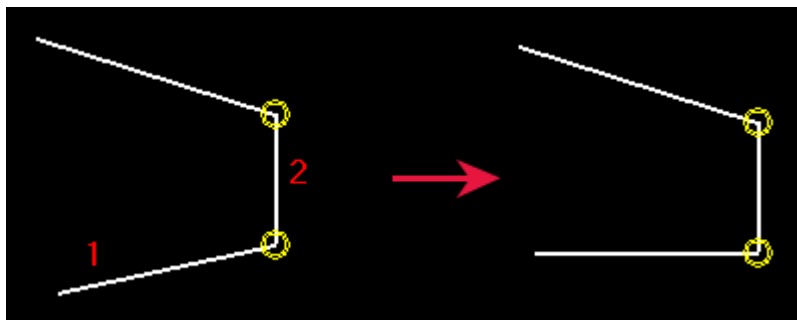


Add a perpendicular constraint

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.

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

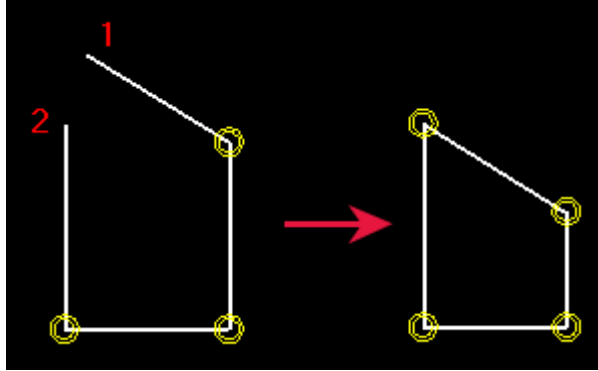
You can use a coincident constraint to force two lines in a sketched profile to start or end at the same point, by extending or shortening one or both lines.

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.

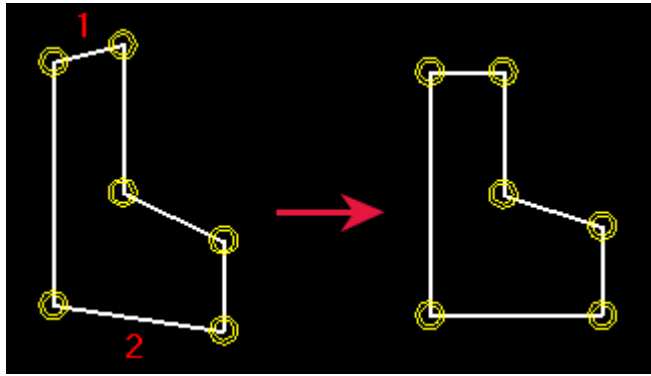
1. Click the **Fixed constraint** button: .
2. Select a line in the sketch.

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.

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)**.

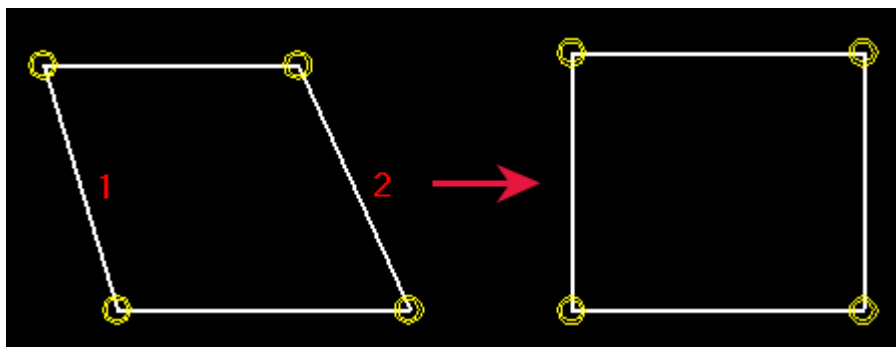


Add a vertical constraint

You can use a vertical constraint to force a line in a sketched profile to be parallel to the local y axis.

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**.

What to do next

Next, [add dimensions to the sketched profile \(page 349\)](#).

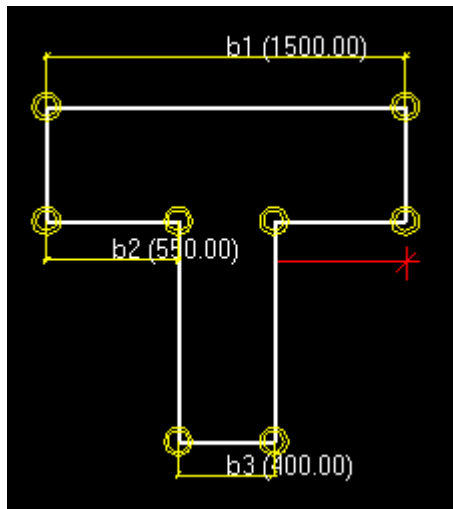
Add dimensions to a sketched profile

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:



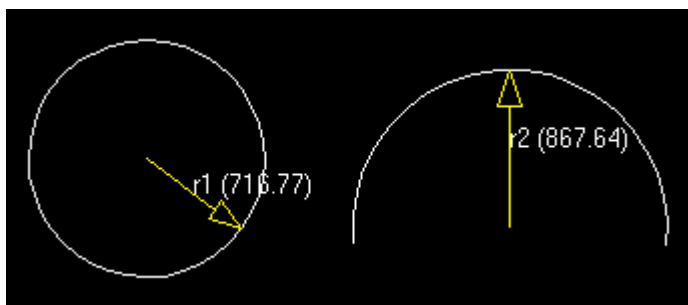
Before you begin

Before you begin, [refine the shape of the sketched profile by adding a constraint \(page 346\)](#).

Add a radial dimension to a sketch

You can create a radial dimension for an arc or a circle in a sketched profile.

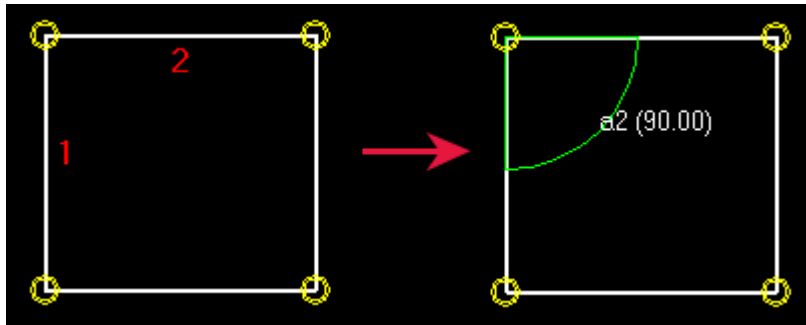
1. Click the **Sketch radial dimension** button: .
2. Select the arc or circle.



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.

1. Click the **Sketch angle dimension** button: .
2. Select the first line **(1)**.
3. Select the second line **(2)**.

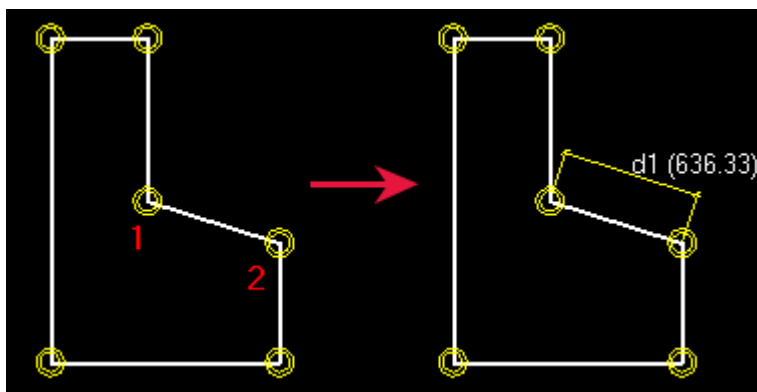


TIP If you are unable to see the angle symbol, scroll with the mouse wheel to zoom in.

Add a dimension between two points in a sketch

You can add a dimension to a sketched profile, between two points you pick.

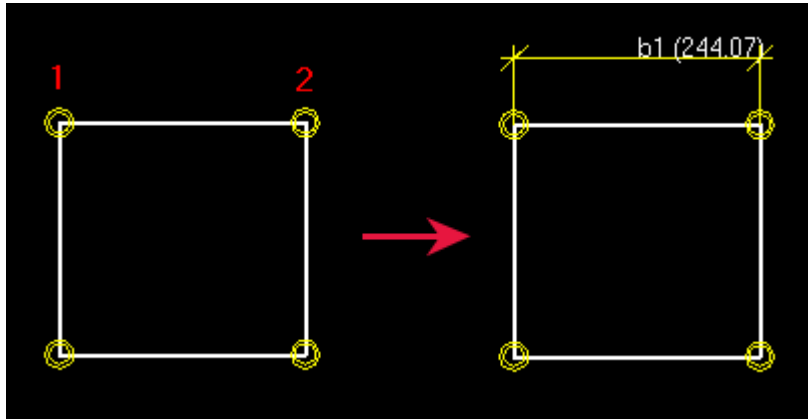
1. Click the **Sketch free dimension** button: .
2. Pick a point to indicate the start point of the dimension **(1)**.
3. Pick a point to indicate the end point of the dimension **(2)**.
4. Pick a point to indicate the location of the dimension lines and text.



Add a horizontal dimension to a sketch

You can add a horizontal dimension to a sketched profile, between two points you pick.

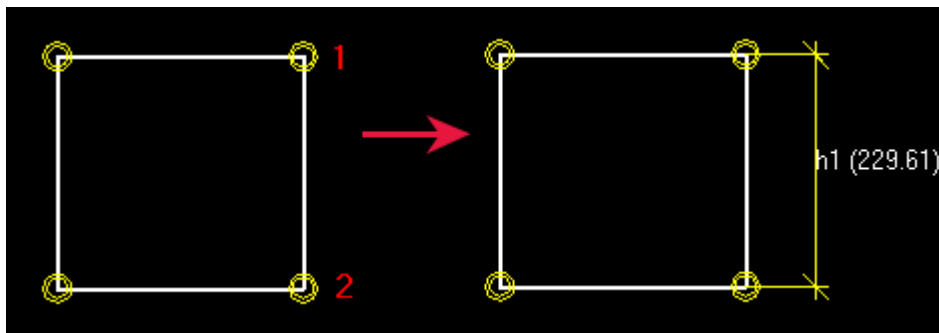
1. Click the **Sketch horizontal dimension** button: .
2. Pick a point to indicate the start point of the dimension **(1)**.
3. Pick a point to indicate the end point of the dimension **(2)**.
4. Pick a point to indicate the location of the dimension lines and text.



Add a vertical dimension to a sketch

You can add a vertical dimension to a sketched profile, between two points you pick.

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, 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, click the **Delete** button.

What to do next

Next, [define positioning planes for the sketched profile \(page 353\)](#).

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.

Before you begin

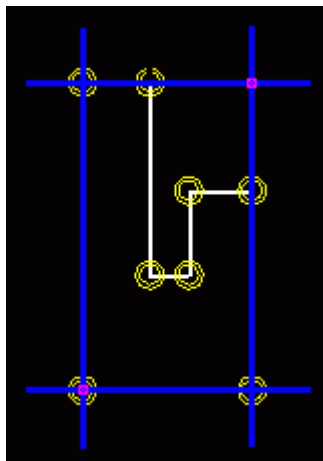
Before you begin, [add dimensions to the sketched profile \(page 349\)](#).

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:



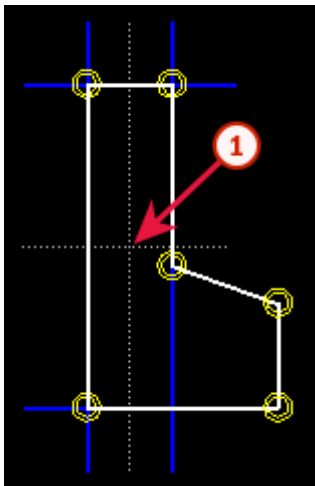
The **On plane** options **Left** and **Right** are set according to the vertical blue planes, and the **Middle** option is halfway between them.

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.

▼ Position		
On plane	Middle ▼	0.00 mm
Rotation	Top ▼	
At depth	Middle ▼	0.00 mm

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:

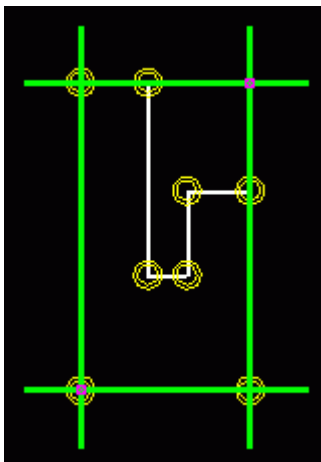


(1) Middle option

Connection positioning planes

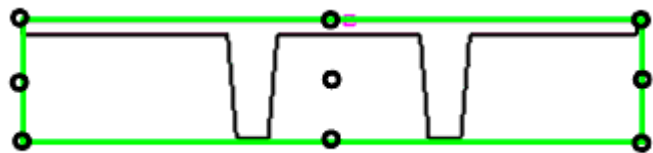
With *connection positioning planes*, you can determine how Tekla Structures positions components in relation to the component main part that has a sketched profile.

The connection positioning planes are shown in green:

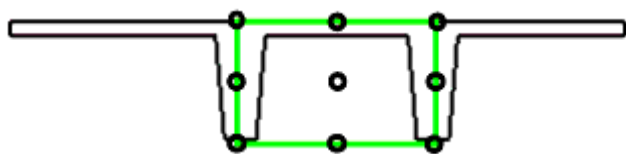


Example

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

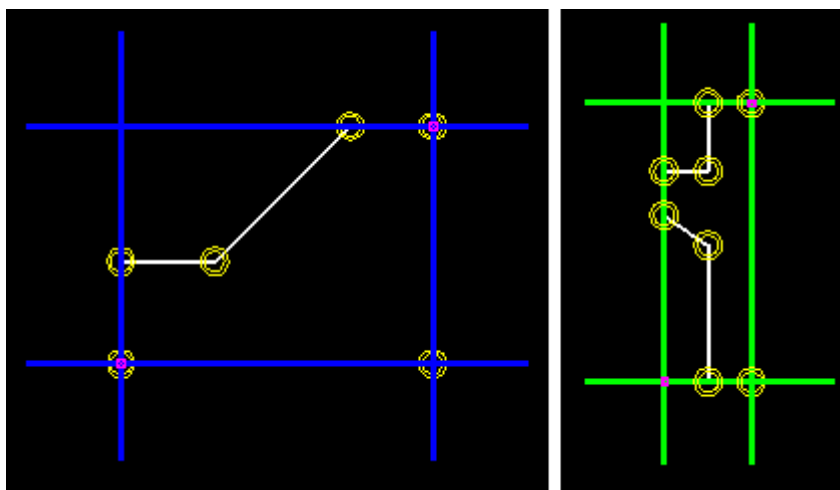
You can move the positioning planes by moving their handles.

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.

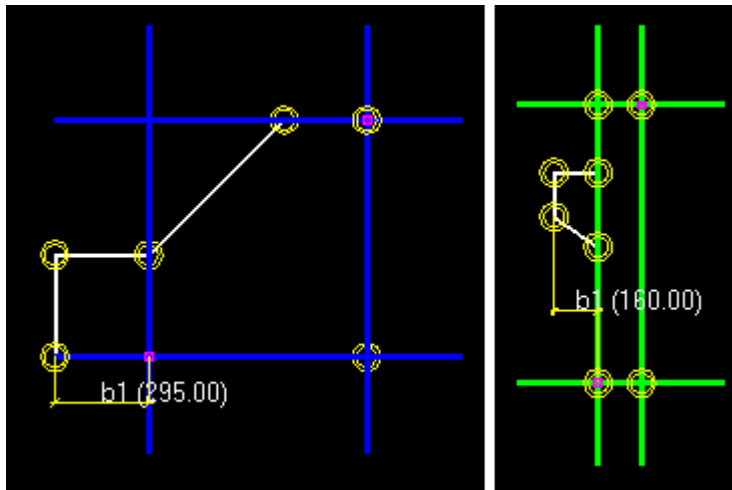
3. Move the handle like any other object in Tekla Structures.

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.
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.

What to do next

Next, [check the sketched profile \(page 358\)](#) to ensure that the constraints and dimensions in the sketched profile work correctly.

Check a sketched profile

Before you save a sketched profile, check that the constraints and dimensions in the sketched profile work correctly.

Before you begin, [define positioning planes for the sketched profile \(page 353\)](#).

1. Double-click a dimension line to open the **Distance Properties** dialog.
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.

Next, [save the sketched profile \(page 358\)](#).

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.

Before you save the sketched profile, [check the sketched profile \(page 358\)](#) to ensure that the constraints and dimensions in the sketched profile work correctly.

NOTE Note the following limitations when naming sketched profiles:

- You cannot use the same name as an existing fixed profile.
- You cannot use numbers, special characters, or blank spaces in the profile name.
- Lower case letters are automatically converted to 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 .

To	Do this
	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 .

You can now [use the sketched profile in a model \(page 359\)](#).

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.

- In the property pane, open the part properties.
For example, to open the beam properties, on the **Steel** tab, hold down **Shift**, then click .
- Click the ... button next to the **Profile** field.
The **Select Profile** dialog appears.
- Open the **Others** branch at the end of the profile tree.
- Select a sketched profile.
- If the profile is parametric, define its dimensions in the **Value** column on the **General** tab.
- Click **OK** to close the **Select Profile** dialog.
- Pick points to place the part in the model.

See also

[Create an image of a profile \(page 370\)](#)

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.
 - Constraints might also prevent you from changing dimensions.
- On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Modify Profile Catalog** dialog box.

2. To open the profile in the sketch editor, right-click a sketched profile, then select **Edit profile**.
3. Double-click a sketch object to modify its properties.
The sketch objects that you can modify are shown in yellow.
4. Modify the properties, then click **Modify**.
5. Close the sketch object properties dialog.
6. 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.

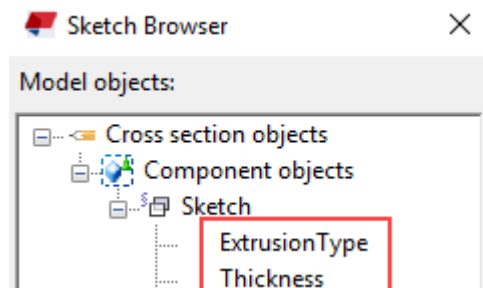
1. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Modify Profile Catalog** dialog box.
2. To open the profile in the sketch editor, right-click a sketched profile, then select **Edit profile**.
3. In the sketch editor, double-click a chamfer symbol .
4. In the **Chamfer Properties** dialog, change the shape and dimensions of the chamfer.
5. Click **Modify**.
6. Click **OK** to close the dialog.
7. 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 \(page 344\)](#) in the sketch editor.

The sketch thickness can be fixed or parametric.



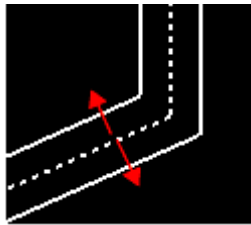
1. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Modify Profile Catalog** dialog box.

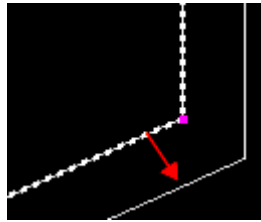
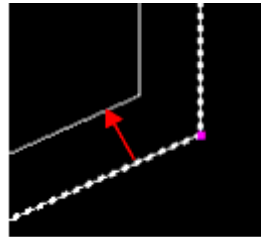
2. To open the profile in the sketch editor, right-click a sketched profile, then select **Edit profile**.
3. Set the sketch thickness in one of the following ways:
 - To set a fixed thickness:
 - a. In the **Sketch Browser**, right-click **Thickness**, then select **Add equation**.
 - b. Enter the value of the thickness after =.
 - To define a parametric thickness:
 - a. In the **Variables** dialog, 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 =.
4. 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 =.
5. 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)	

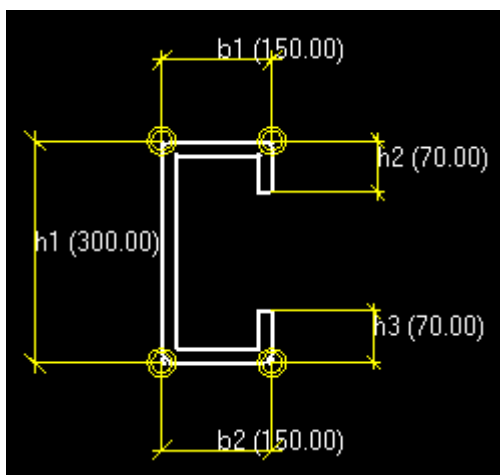
Type	Description	Image
1	The sketch is extruded to the outside of the polyline.	
2	The sketch is extruded to the inside of the polyline.	

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)

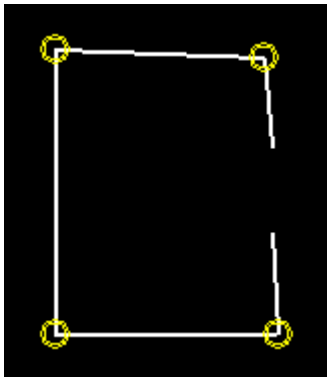


Example: Sketch a C-shaped profile

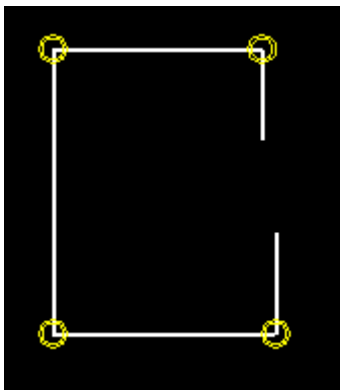
Start by sketching the outline of the profile.

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.

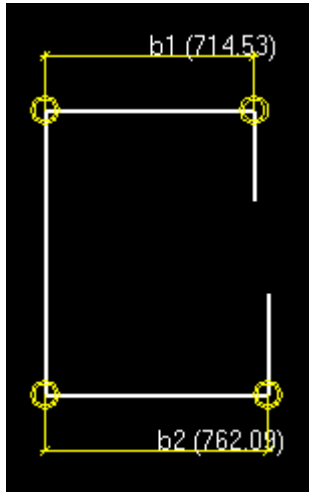


4. Save the profile and name it CSHAPE.

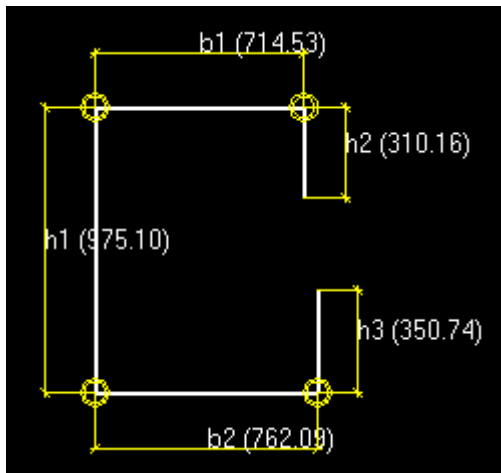
Example: Add dimensions to the sketched profile

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, enter the following values for the distances:

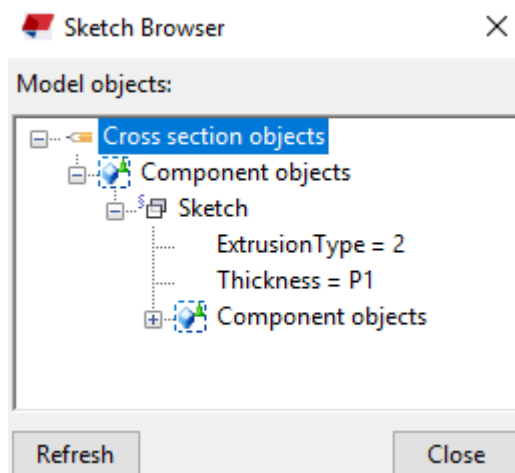
Name	Formula	Value	Value type	Variable type	Visibility	Label in dialog box
b1	150.00	150.00	Length	Distance	Show	Width
b2	=b1	150.00	Length	Distance	Hide	Width
h1	300.00	300.00	Length	Distance	Show	Height
h2	70.00	70.00	Length	Distance	Show	Height
h3	=h2	70.00	Length	Distance	Hide	Height

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, 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.



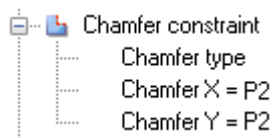
3. Save the sketched profile.

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, change the chamfer type to **Line** , and then click **Modify**.
 - c. Repeat steps 1a–b for all the chamfers.
2. In the **Variables** dialog, 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.

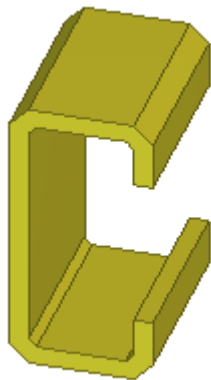
1. Double-click a part to open the part properties in the property pane.
2. Click the ... button next to the **Profile** box.

The **Select Profile** dialog 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.

Property	Symbol	Value	Unit
Width	b1	150.00	mm
Height	h1	300.00	mm
Height	h2	70.00	mm
Thickness	P1	20.00	mm
Chamfer	P2	10.00	mm

5. Click **OK** to apply the changes.
6. Pick points to place the part in the model.

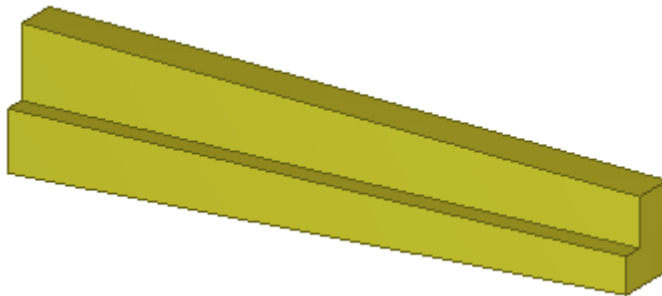


Create parametric profiles with variable cross sections

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 \(page 330\)](#) with multiple cross sections instead.

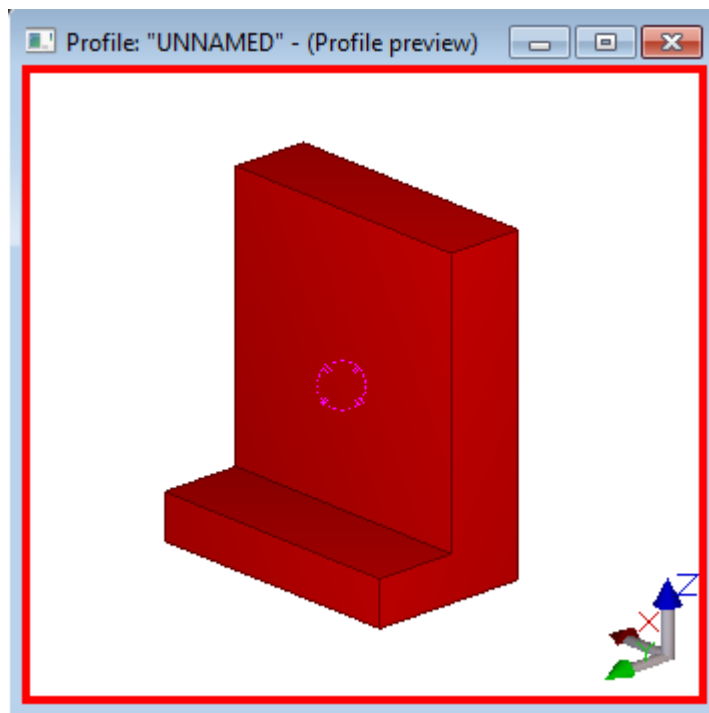
Create a profile with variable cross sections

Before you start:

- [Create a sketched profile \(page 341\)](#) using the sketch editor.

- In the **Variables** dialog 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 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.

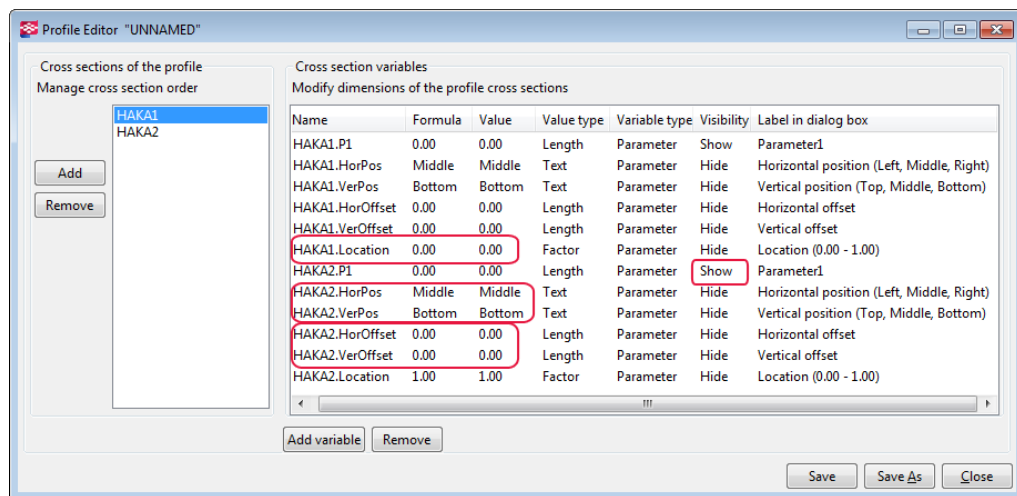


4. Under **Cross sections of the profile**, add cross sections or remove selected cross sections by clicking **Add** or **Remove**.

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, 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. Right-click a profile with variable cross sections, then select **Edit profile** to open the profile in the **Profile Editor**.
3. Modify the profile properties.
4. 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 the <installation folder>\Environments\<environment> folder, locate the `industry_standard_profiles.inp` file.

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

For example, if you install Tekla Structures in the
\\Program Files\\Tekla Structures\\<version> folder, the
file is located in the ..\\ProgramData\\Trimble\\Tekla
Structures\\<version>\\Environments\\<environment> folder.

If there is no `industry_standard_profiles.inp` file in your environment, you can use the file from 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, such as 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.

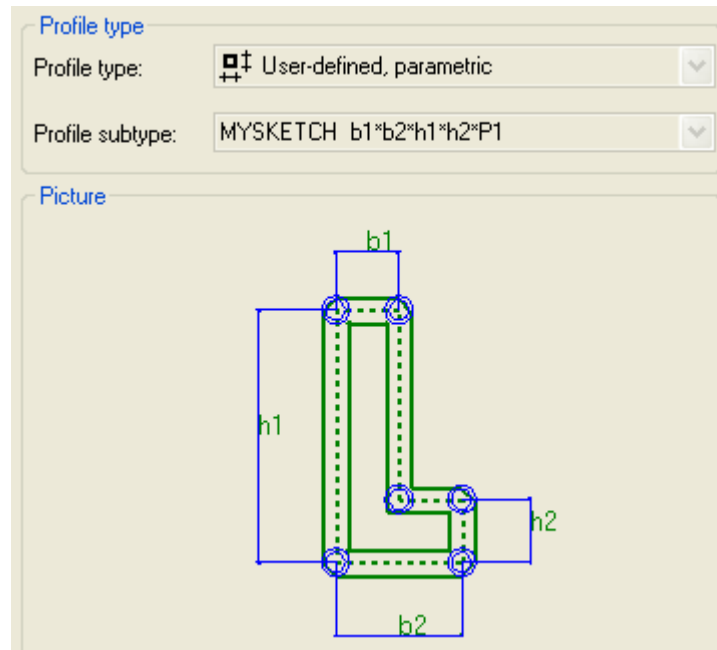
The file name must match the profile name. For example, if the name of a [fixed profile \(page 330\)](#) or a [sketched profile \(page 341\)](#) is mysketch, the image must be named mysketch.bmp.

If the [profile has been created using a .clb file \(page 334\)](#), 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 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 \(page 58\)](#). The shapes that you import, download from [Tekla Warehouse](#), or [create using existing geometry \(page 373\)](#) 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 \(page 17\)](#).

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 \(page 372\)](#).

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**.

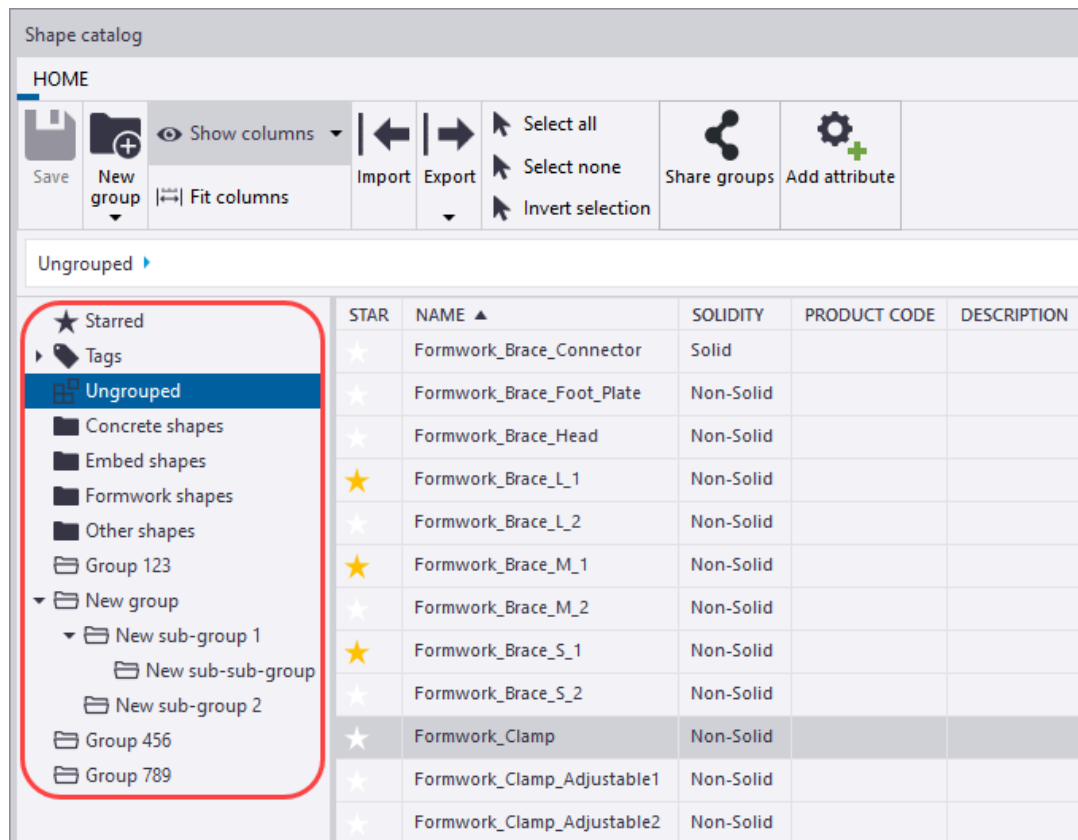
Tekla Structures changes the part to an item and adds a new shape to the [shape catalog \(page 372\)](#).

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** dialogs. In the **Shape catalog** dialog, 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 \(page 373\)](#) 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 \(page 382\)](#) 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 is used for selecting a shape for an item. In the

Select shape dialog, 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.
2. To add a sub-group to an existing group, select the group on the left side of the dialog.

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, 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.
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, enter the new name, then click **Rename**.
4. To modify group properties, such as the manufacturer or [tags \(page 385\)](#) 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, 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.
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.

Selecting different sets of shapes is useful when you want to [export \(page 389\)](#) or [add tags \(page 385\)](#) to certain shapes, or otherwise modify a sub-set of shapes.

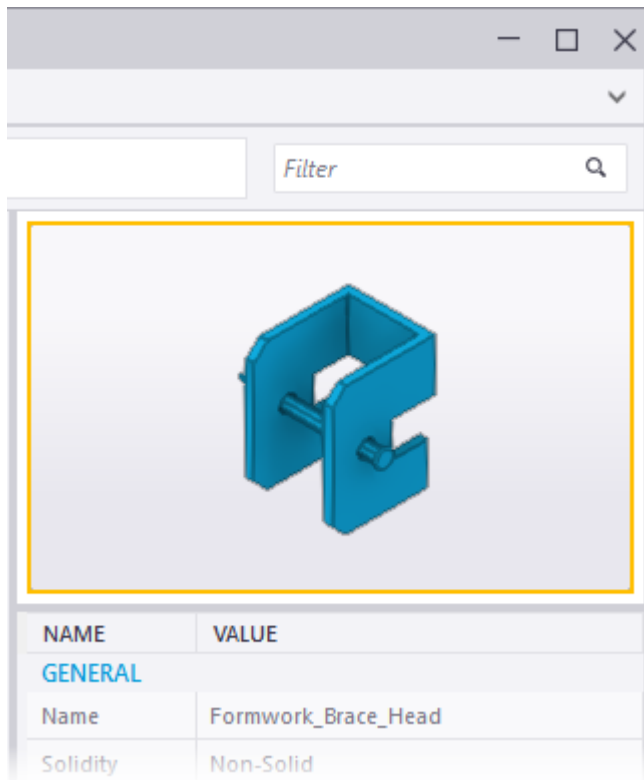
- Use the following commands on the catalog ribbon:
 - Click **Select all** to select all the shapes in the currently visible group. Alternatively, you can select one shape, then press **Ctrl+A**.
 - Click **Select none** to clear the current selection.
 - Click **Invert selection** to select the currently 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** dialogs, Tekla Structures shows a preview of the selected shape in the upper right corner of the dialog.

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.
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 that appears, select a group. In the dialog, 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 that appears, select a group. In the dialog, 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.
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, modify the shape properties.

For example, you can add a description or [tags \(page 385\)](#) 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.

If you want to show shape properties or user-defined attributes in reports, use **PART** rows in the report templates and add the **PROFILE.** or **SHAPE.** prefix in front of the attribute names. For example, `GetValue("PROFILE.Material")` or `GetValue("SHAPE.Material")`. The attribute names can be found in the shape's definition file (`.xml`).

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.

1. On the **File** menu, click **Catalogs --> Shape catalog** to open the **Shape catalog** dialog.
2. Select the shapes to which you want to add a new attribute.



3. Click **Add attribute**.

4. In the **Define attribute** dialog, 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 and in the **Select shape** dialog, 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, 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.
2. Select a group or sub-group on the left side of the dialog.
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.
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 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, 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, 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 opens when you click the ... button next to the **Shape** box in the item properties, or in a component dialog.

The changes that you make to the dialog 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.

Show or hide the catalog ribbon

You can show or hide the catalog ribbon in catalog dialogs and selection dialogs.

You can show or hide the catalog ribbon in the following dialogs:

- **Rebar catalog**
- **Select rebar**
- **Shape catalog**
- **Select shape**

By default, the ribbon is shown in catalog dialogs, but hidden in selection dialogs.

- 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 dialogs:

- **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.

To	Do this
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: - Sort by one column. - 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 and the **Select shape** dialog. You can use filtering together with other methods, such as sorting.

- Open the **Shape catalog** dialog or the **Select shape** dialog.
 - On the **File** menu, click **Catalogs** --> **Shape catalog** to open the **Shape catalog** dialog.
 - To open the **Select shape** dialog, click the ... button next to the **Shape** box in the item properties, or in a component dialog.
 - In the **Filter** box, type the search term or filtering criteria.
 - 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 or the **Select shape** dialog.
 - On the **File** menu, click **Catalogs** --> **Shape catalog** to open the **Shape catalog** dialog.
 - To open the **Select shape** dialog, click the ... button next to the **Shape** box in the item properties, or in a component dialog.
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, 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.
2. Select the shapes that you want to tag.
3. In the **Tags** box at the bottom-right corner of the **Shape catalog** dialog, 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.
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 \(page 373\)](#) 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 \(page 374\)](#) 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.
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.

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, 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, 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:

- 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, 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. 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.

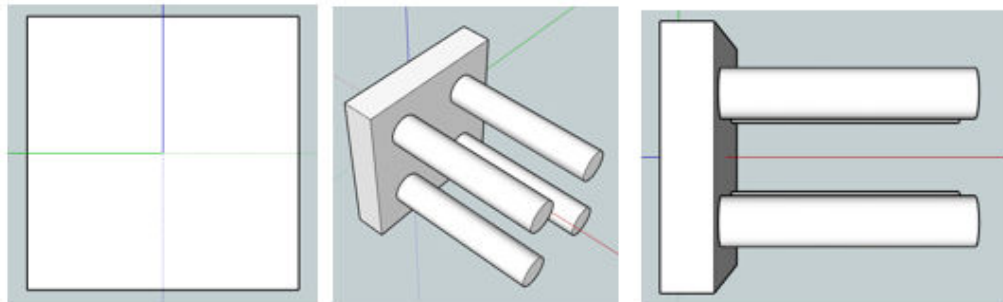
All SketchUp groups and components should form watertight solids. Select the group or component and open **Entity Info** to check that the selection is a solid. SketchUp solids have a volume. If there is no volume listed, the selection is not a solid.

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 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.
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 377) , right-click, and select Export .

4. In the **Export to** dialog, 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. The shape name is used as the name of the export file.

If the shape name contains any of these characters, they are replaced with an _ (underscore) in the file name:

- < (less than)
- > (greater than)
- : (colon)
- " (double quote)
- / (forward slash)
- \ (backslash)
- | (vertical bar or pipe)

- ? (question mark)
- * (asterisk)

We recommend that you avoid using these characters in shape names.

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. The file name extension is:

- .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 \(page 386\)](#), 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, click **Compress**.
5. Close the model, then open it again.

Clean or restore shape geometry files

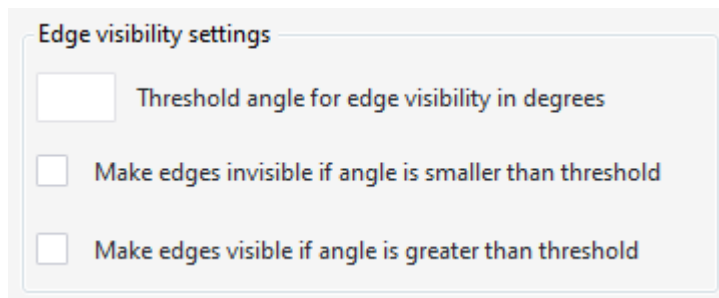
If some previously imported shapes cause missing faces or edges in items or drawings, you can clean the shape geometry files.

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 \(page 386\)](#), 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 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 checkbox.
- c. To show edges when the neighboring shape faces are in a greater angle than the threshold value, select the second checkbox.

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 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.

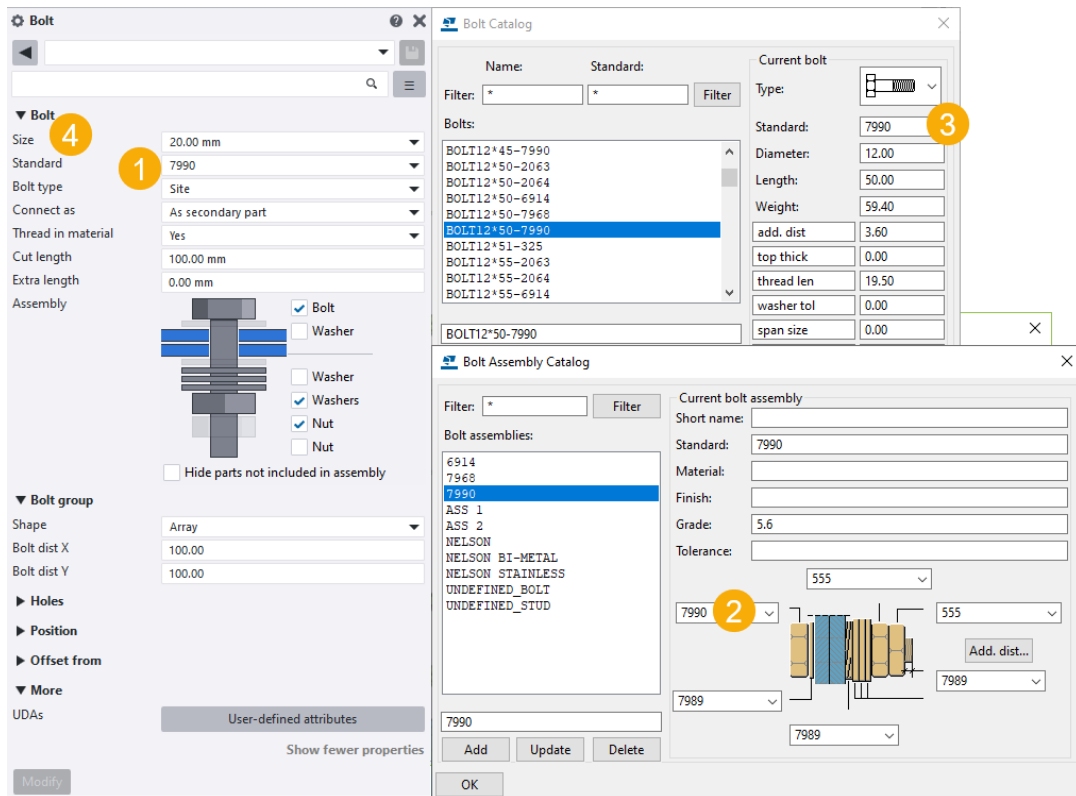
To open the **Bolt Catalog** dialog, click the **File** menu, then select **Catalogs --> Bolt catalog**.

See also

[How the bolt catalog and bolt assembly catalogs work together \(page 393\)](#)

[How bolt and bolt assembly catalogs affect length calculation \(page 402\)](#)

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.

You cannot use a bolt if it does not belong to a bolt assembly. Ensure that the catalog also includes nuts and washers that work with the new bolt so that you can create a bolt assembly.

TIP You can also add bolts, nuts, and washers by importing them into the bolt catalog.

1. On the **File** menu, click **Catalogs** --> **Bolt catalog** to open the **Bolt Catalog** dialog.
2. If you want to create a new bolt, nut, or washer based on an existing one, select an existing bolt, nut, or washer in the **Bolts** list.
3. Type a unique name in the box below the **Bolts** list.

A screenshot of a software dialog box. At the top is a text input field. Below it are three buttons labeled 'Add', 'Update', and 'Delete'.

You can enter a maximum of 40 characters in the name box.

4. From the **Type** list, select an option to define the bolt element type.
5. Define the other properties of the new bolt, nut, or washer.

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.

6. Click **Add**.
7. If the catalog does not include nuts and washers that work with the new bolt, click **Update**, then add the nuts and washers in the same way as you added the bolt.
8. When you have finished adding all bolts, nuts, and washers, click **OK**.

The **Save confirmation** dialog opens.

9. Select **Save changes to model folder**, then click **OK**.

A new `screwdb.db` file that contains your new parts is created in the current model folder. You can copy this file to the firm folder or to a model template to use it in other new projects.

Next, add a bolt assembly to the catalog to define the parts that make up the bolt type.

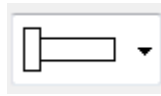
Add a stud bolt to the catalog

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.

2. Enter values for the following properties:

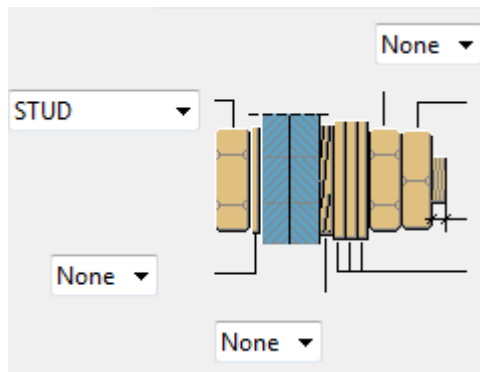
- **Name:** Name for the stud bolt.



- **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.
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.
2. Select a bolt from the list.
3. Modify the properties.
4. Click **Update**.

5. Click **OK**.

The **Save confirmation** dialog 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.

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 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

After you add bolts to the bolt catalog, add new bolt assemblies to the bolt assembly catalog to define the parts that make up the bolt type.

You cannot use a bolt if it does not belong to a bolt assembly. The bolt assembly can contain bolts or studs, but not both.

1. On the **File** menu, click **Catalogs** --> **Bolt assembly catalog** to open the **Bolt Assembly Catalog** dialog.

2. Type a unique name in the box below the **Bolt assemblies** list.

The image shows a screenshot of a software dialog box. At the top, there is a text input field. Below it, there are three buttons labeled 'Add', 'Update', and 'Delete'.

3. Define the other properties of the new bolt assembly and select the washer and nut types.

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.

The values in the **Standard** and **Grade** boxes can be used in reports.

4. Click **Add**. The new bolt assembly is highlighted in the **Bolt assemblies** list.

5. Click **OK**.

The **Save confirmation** dialog opens.

6. Select **Save changes to model folder**, then click **OK**.

A new `assdb.db` file is created in the current model folder. You can copy this file to the firm folder or to a model template to use it in other new projects.

Modify bolt assembly information in the catalog

1. On the **File** menu, click **Catalogs** --> **Bolt assembly catalog** to open the **Bolt Assembly Catalog** dialog.
2. Select a bolt assembly from the list.
3. Modify the [properties \(page 407\)](#).
4. Click **Update**.
5. Click **OK**.

The **Save confirmation** dialog 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.
2. Select a bolt assembly from the list.
3. Click **Delete**.
4. Click **OK**.

The **Save confirmation** dialog 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.
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 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.
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.
2. Right-click in the **Bolt assemblies** list, then select **Import**.
3. Select the import file.
4. Click **OK**.
 If any bolt elements or bolt assemblies in the import file already exist in the bolt assembly catalog, the **Review import items** dialog opens. Otherwise, the imported bolt assemblies are shown on the **Bolt assemblies** list with their original names.
5. In the **Review import items** dialog, select the action for each bolt element or bolt assembly.
 - a. Select the row for one or more bolt elements or bolt assemblies.
 To select multiple rows, hold down **Ctrl** or **Shift** and click the rows.
 - b. Click one of these buttons to select the action for the selected rows:
 - **Leave:** The bolt element or bolt assembly in the import file is ignored. The bolt element or bolt assembly that already exists in the bolt assembly catalog is not changed.
 - **Replace:** The bolt element or bolt assembly in the import file replaces the existing bolt element or bolt assembly in the bolt assembly catalog.
 - c. After you have selected the action for all rows, click **Continue**.
6. Click **OK**.
 The **Save confirmation** dialog opens.
7. 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.
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.

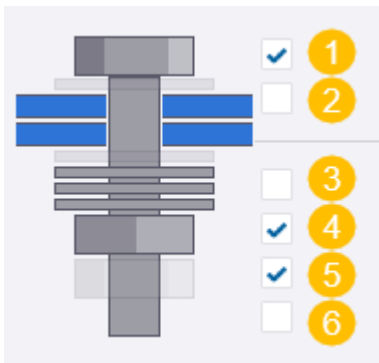
The exported bolt catalog is the `screddb.lis` file in the current model folder.

How bolt and bolt assembly catalogs affect length calculation

Tekla Structures calculates bolt length based on the thickness of the materials being joined, plus any washers and nuts.

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 bolts with the length that you need, you can [add them to the bolt catalog \(page 394\)](#).

These **Assembly** settings in the properties dialog affect the bolt length calculation.



(1) If this checkbox is not selected, only a hole is created.

(2) First washer

(3) Second washer

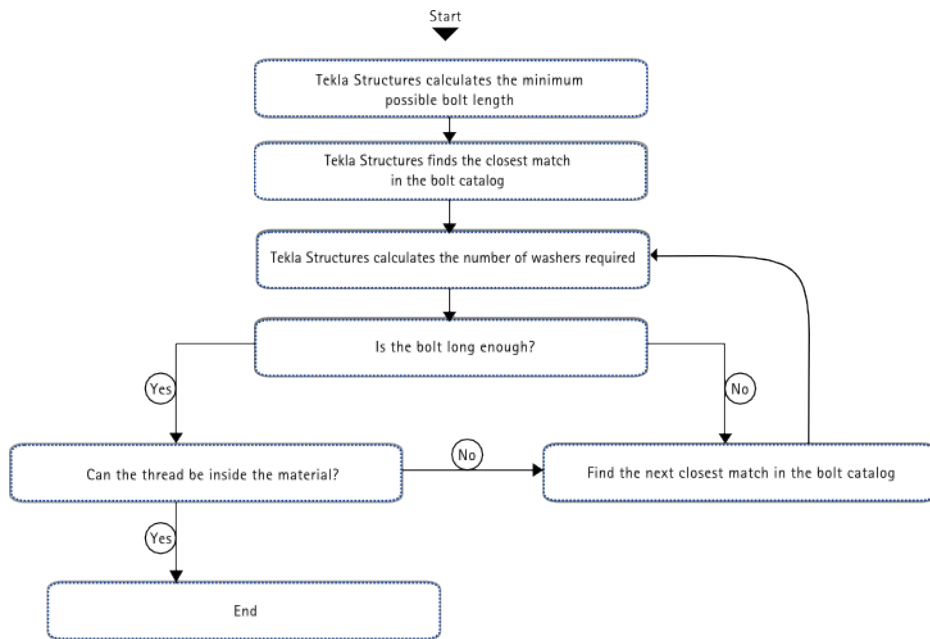
(4) Additional washers

(5) First nut

(6) Second nut

If the checkbox for a bolt element is selected, the bolt element is used in the bolt assembly and in the bolt length calculation.

The chart and the steps below explain the process of bolt length calculation.

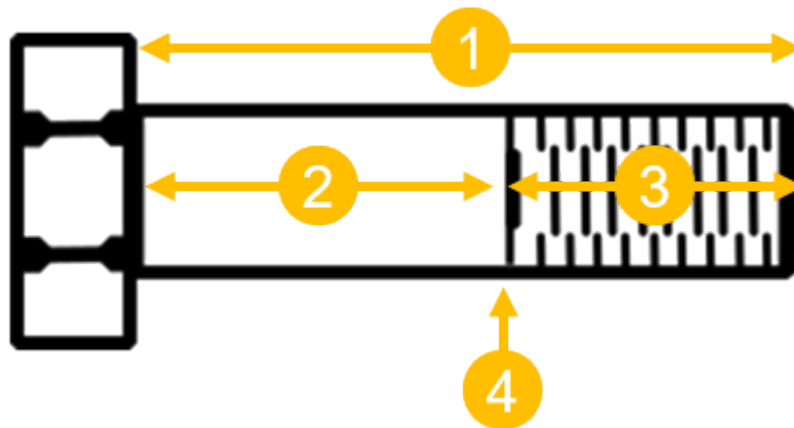


If no bolt that meets these requirements is found in the bolt catalog, the model shows that the bolt is not valid.

1. Tekla Structures calculates the **minimum possible length** of the bolt:
 first washer thickness
 + material thickness
 + second washer thickness
 + additional washer thickness
 + first nut thickness
 + second nut 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:**
 first nut thickness
 + material thickness
 + second nut thickness
 + first washer thickness
 + second washer thickness
 + (number of washers * additional washer thickness)
4. Tekla Structures checks that the **bolt found in step 2 is longer than:**
 extra length

- + first nut thickness
 - + material thickness
 - + second nut thickness
 - + add. dist (from the bolt catalog)
 - + first washer thickness
 - + second washer thickness
 - + (number of washers * additional washer thickness)
5. If the selected bolt does not fulfill the criteria in step 4, Tekla Structures returns to step 2. Otherwise, it continues to step 6.
 6. Tekla Structures checks that the selected bolt fulfills **all the following conditions**.

These calculations refer to the following parts of the bolt:



- (1)** Total shaft length
- (2)** Grip length: the length of the unthreaded shank, excluding the runout
- (3)** Thread length: the length of the thread, excluding the runout
- (4)** Runout: the part of the bolt between the unthreaded shank and the thread

- Can the thread be inside the material to be connected?

Even if the thread **cannot** be inside the material, 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.

- Grip length must be more than:
 - material thickness
 - + extra length

- + first washer thickness
- maximum allowed thread in material (OR 3 mm or 4 mm if thread in material = no)
- Grip length is calculated as:
 - total shaft length
 - thread length
 - runout
- The length of the runout is calculated as follows:

Diameter of bolt (mm)	Runout (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.

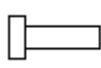
For example, if this value is not taken into account and the calculated length is 38.001 mm, a 39 mm bolt might be selected.

Bolt catalog properties

Use the **Bolt Catalog** dialog 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: 

Option	Description
	   (Nut)  (Washer)  (Stud)
Standard	The name of the bolt element standard. Used in the Bolt Assembly Catalog dialog 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.

Option	Description
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 \(page 394\)](#)

[How the bolt catalog and bolt assembly catalogs work together \(page 393\)](#)

Bolt assembly catalog properties

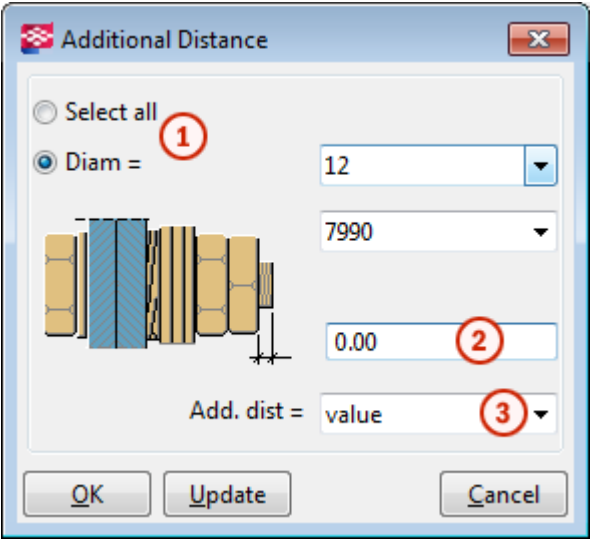
Use the **Bolt Assembly Catalog** dialog to view and modify the properties of bolt assemblies.

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, and in the Bolt standard list in the Bolt Properties dialog. 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 \(page 394\)](#)

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 \(page 96\)](#), `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.



2. Click **New bar**.

3. In the **New bar** dialog, 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.
2. Browse for and select the definition that you want to copy.



3. Click **Copy**.

4. In the **Copy** dialog, 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.

- 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.
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, 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.
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** dialogs.

The screenshot shows the 'Rebar catalog' dialog. On the left, there is a list of groups: Starred, 1.4301, 1.4404, 1470/1670, 1570/1770, 1630/1860, A, A500HW (highlighted), AISI304, B, and B500A. A red box highlights the group list. On the right, there is a table with columns: STAR, CODE, GRADE, SIZE, USAGE, NOMINAL, ACTUAL, and BENDING. The table contains 10 rows of data.

STAR	CODE	GRADE	SIZE	USAGE	NOMINAL	ACTUAL	BENDING
	B4	A500HW	6	main	6.00	8.00	72.00
	B4	A500HW	6	tie/stirrup	6.00	8.00	12.00
	B4	A500HW	8	main	8.00	10.00	96.00
★	B4	A500HW	8	tie/stirrup	8.00	10.00	16.00
	B4	A500HW	10	main	10.00	12.00	120.00
	B4	A500HW	10	tie/stirrup	10.00	12.00	20.00
	B4	A500HW	12	main	12.00	14.00	144.00
	B4	A500HW	12	tie/stirrup	12.00	14.00	30.00

By default, the definitions in the rebar catalog are grouped according to reinforcement grades. You can [change how the definitions are grouped \(page 415\)](#) in the **Rebar catalog** dialog or in the **Select rebar** dialog.

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.

2. On the left side of the dialog, select a group, and then click  **Copy**.
Alternatively, you can right-click a group and select **Copy**.

3. In the **New group name** dialog, 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 \(page 409\)](#) 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.
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, modify the group properties.

For example, you can change the grade or cranked length type. You may also want to [add tags \(page 418\)](#) 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.
2. Select a group from the list on the left side of the dialog.
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.

3. Click  **Import**.

4. In the **Import rebar definitions** dialog, 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 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.
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, 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 can organize the rebar catalog view to suit your needs and ways of working.

In the **Rebar catalog** dialog, 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, 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 opens when you click the **...** button next to the **Size** box in a reinforcement object's properties, or in a component dialog to select a rebar definition.

The status bar at the bottom of the **Rebar catalog** and **Select rebar** dialogs 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, the status bar also shows the number of the selected definitions.

The changes that you make to the dialog 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.

Show or hide the catalog ribbon

You can show or hide the catalog ribbon in catalog dialogs and selection dialogs.

You can show or hide the catalog ribbon in the following dialogs:

- **Rebar catalog**
- **Select rebar**
- **Shape catalog**
- **Select shape**

By default, the ribbon is shown in catalog dialogs, but hidden in selection dialogs.

- 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** dialogs.

1. Open the **Rebar catalog** dialog or the **Select rebar** dialog.
 - On the **File** menu, click **Catalogs --> Rebar catalog** to open the **Rebar catalog** dialog.
 - To open the **Select rebar** dialog, 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**.

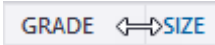
Work with property columns in the catalog view

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 dialogs:

- **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

To	Do this
	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 and the **Select rebar** dialog. You can use filtering together with other methods, such as sorting.

1. Open the **Rebar catalog** dialog or the **Select rebar** dialog.
 - On the **File** menu, click **Catalogs --> Rebar catalog** to open the **Rebar catalog** dialog.
 - To open the **Select rebar** dialog, 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 opens with the **Starred** group selected.

1. Open the **Rebar catalog** dialog or the **Select rebar** dialog.
 - On the **File** menu, click **Catalogs --> Rebar catalog** to open the **Rebar catalog** dialog.
 - To open the **Select rebar** dialog, 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.

STAR	CODE	GRADE	SIZE
★	B4	A500HW	10

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, you can add tags to rebar definition to add keywords or other metadata the definitions.

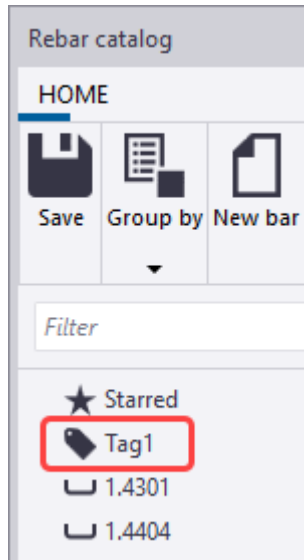
For example, you could use tags like `Stainless` and `Acid proof`.

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.
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, 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.
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 \(page 58\)](#).

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.

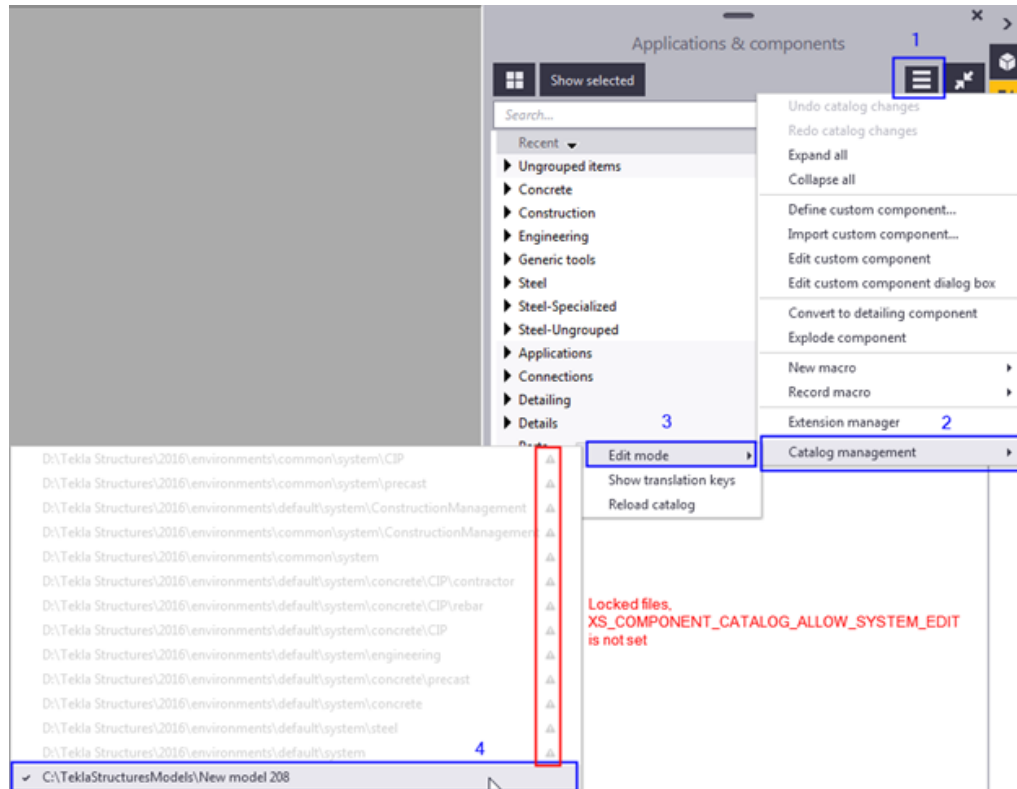
You can also [add your own instructor side pane help pages \(page 428\)](#) for the tools in the **Applications & components** catalog.

Edit the Applications & components catalog

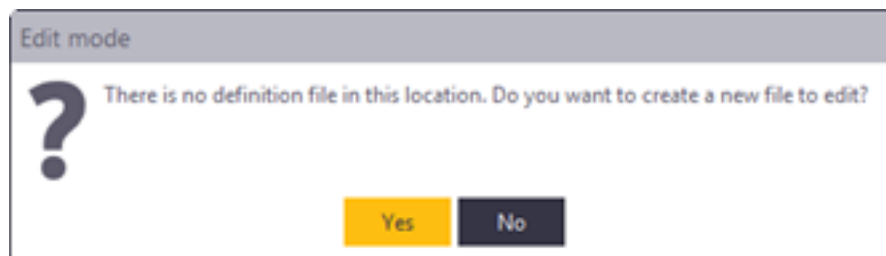
1. To edit the catalog definition files, set the XS_COMPONENT_CATALOG_ALLOW_SYSTEM_EDIT advanced option to TRUE.
2. In the **Applications & components** catalog, click  **Access advanced features --> Catalog management --> Edit mode**, then select the catalog definition file that you want to edit.

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.

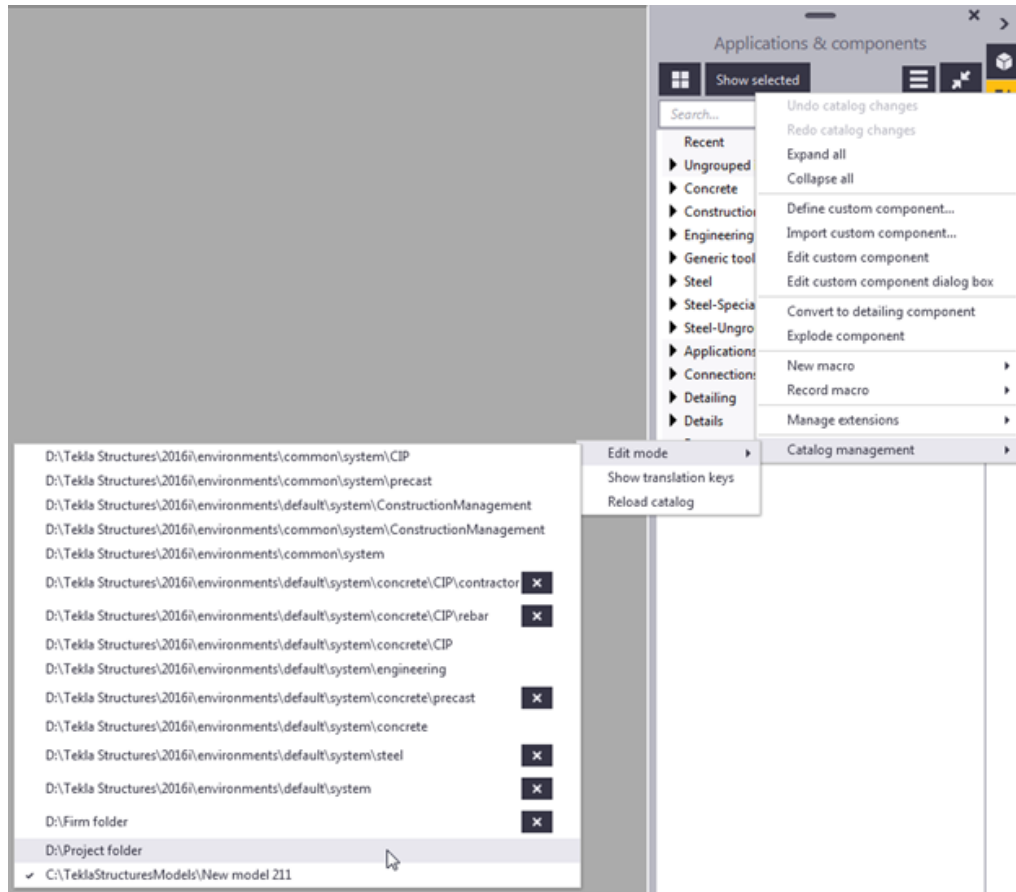
If XS_COMPONENT_CATALOG_ALLOW_SYSTEM_EDIT is not set to TRUE, a small warning icon is shown next to the files in the XS_SYSTEM folder locations. The image shows warning icons next to the files that appear dimmed.



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.

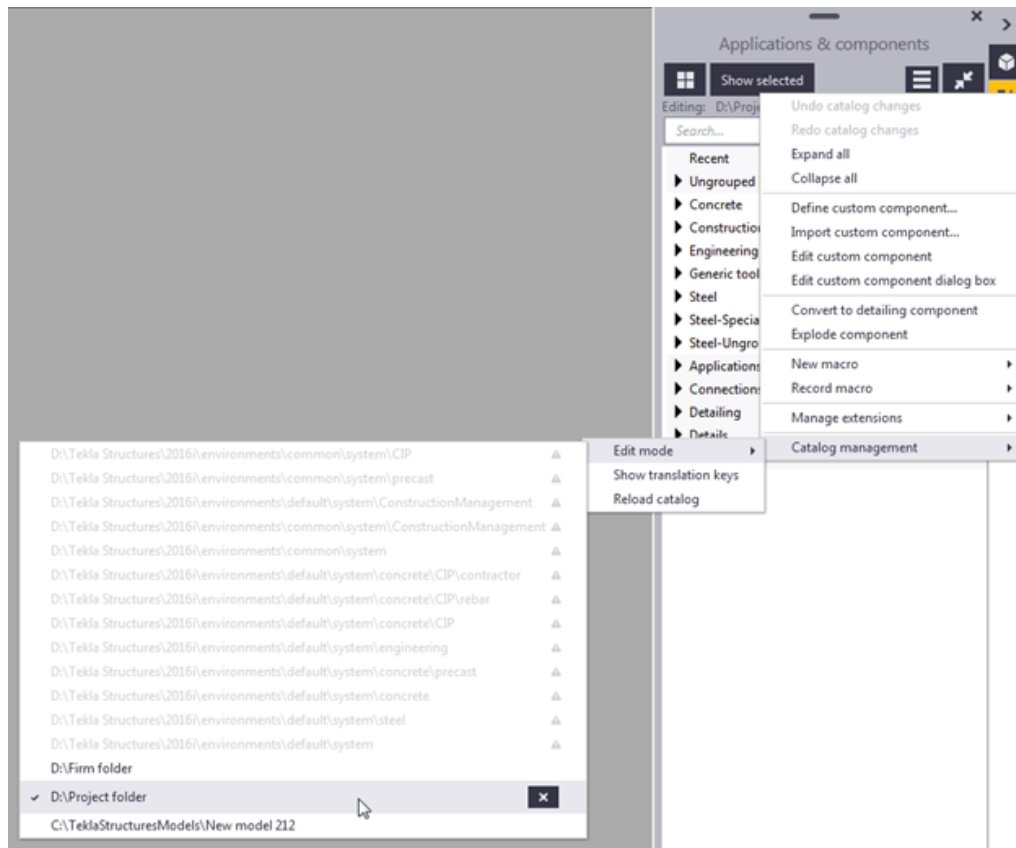


You can remove an existing file by clicking the  button next to the file.



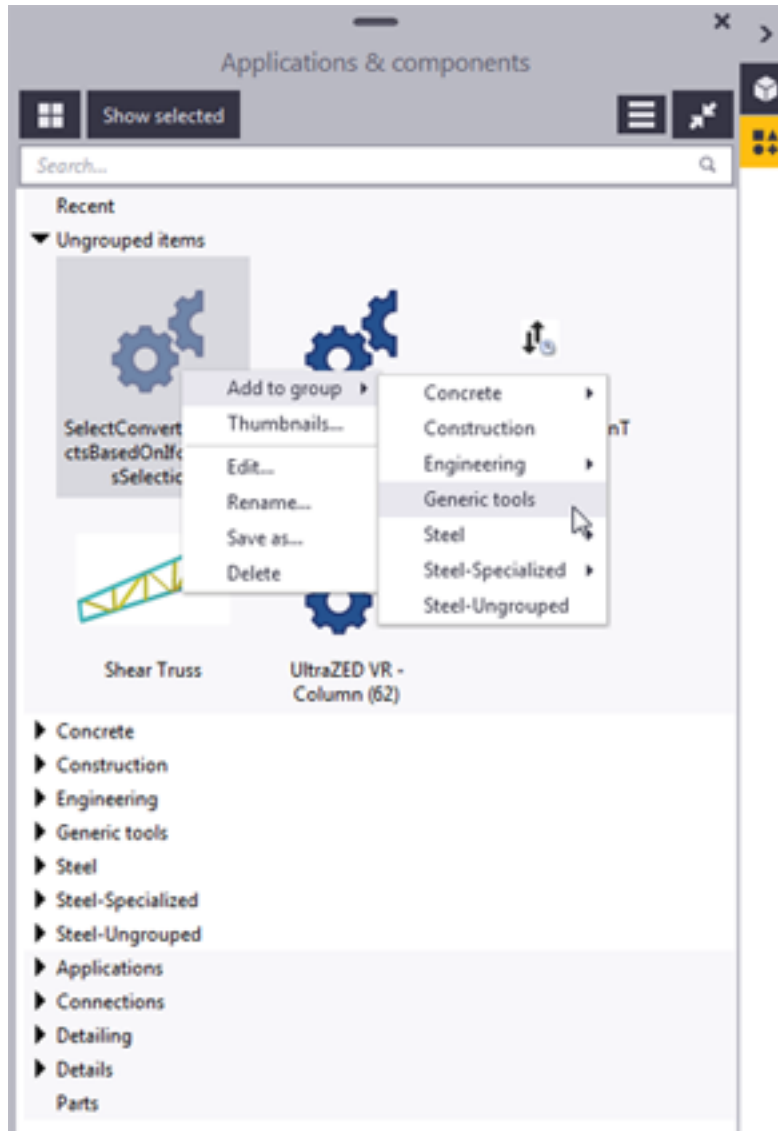
3. Select the file that you want to edit.

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.

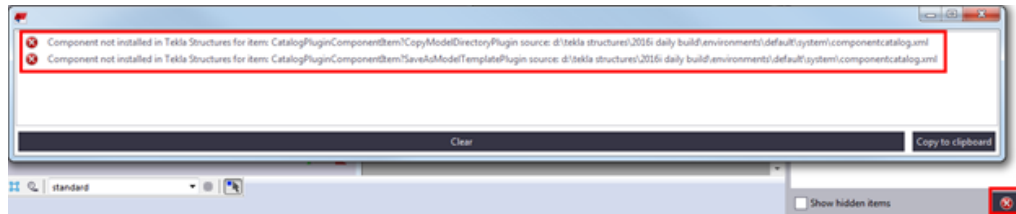


It is important to keep the **Ungrouped items** group empty because all items downloaded from Tekla Warehouse are placed in that group. When you place an item to a predefined group, it is automatically removed from the ungrouped items.

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.



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**.

Publish a group in the Applications & components catalog

You can collect content, such as macros, extensions, and system and custom components to a group that you create in the **Applications & components** catalog. You can then publish the group as a catalog definition file to make it available for other Tekla Structures users. For the published content to work correctly in another Tekla Structures installation, the content must also exist in that installation.

1. Click the **Applications & components** button  in the side pane to open the **Applications & components** catalog.
2. Create a new group:
 - a. Right-click in the catalog and select **New group**.
 - b. Enter a name for the group.
 - c. Select the group and click the small arrow on the right to add a description to the group.
 - d. Add content to the group.
Some content in the **Applications & components** catalog may be hidden. To publish the hidden content, select the **Show hidden items** checkbox at the bottom of the catalog.
Note that the model-specific items you add to the group are visible in the modeling mode and the drawing-specific items in the drawing mode.
 - e. Add the needed information to the items in the group: description, tags, and additional thumbnail images.
Use a thumbnail image from the \Tekla Structures\<version>\Bitmaps folder to ensure that the image is available for other Tekla Structures users.
3. Right-click the group and select **Publish group** to create a catalog definition file.

The file contains the following information:

- Name and description of the published group
- Names and descriptions of the subgroups
- References to the items that you have added to the group

The file does not contain the actual items. When other users use the group, they must ensure that the referenced items exist in their Tekla Structures installation and model.

- Descriptions, tags and thumbnail references of the items in the group

The file does not contain the actual thumbnail image files.

4. Add a unique prefix to the filename in the **Publish group** dialog.

The filename format must be `<prefix>_ComponentCatalog.ac.xml`.

5. Click **Save**.

The file is by default saved to the model folder.

6. Make the group available for other Tekla Structures users by moving the `<prefix>_ComponentCatalog.ac.xml` catalog definition file to an appropriate folder:

- [Project, firm or system \(page 58\)](#) folder defined in `XS_PROJECT`, `XS_FIRM`, or `XS_SYSTEM`.
- `\attributes` folder under the current model folder
- `Extensions` folder in `\Tekla Structures\<version>\environments\common\extensions`, or to any of the folders defined in `XS_EXTENSION_DIRECTORY`.

The **Applications & components** catalog also searches the subfolders of these folders. We recommend that you use the extension folders if you have created your own extensions and have included them in the group.

7. Check that the catalog definition file works correctly:

- a. Delete the published group from your **Applications & components** catalog.

- b. Click  > **Catalog management** > **Reload catalog** to load and view the published group.

When you have checked the group, other users can start using it:

- If the group content is already included in other users' Tekla Structures installation, they can use the group immediately after reloading the catalog by clicking  > **Catalog management** > **Reload catalog**.
- If the group content, for example extensions, is not included in other users' Tekla Structures installation, they have to download the missing extensions

from Tekla Warehouse first, and then re-open the model where they are going to use the group.

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 that opens, select the target file path and enter the file name, then click **Save** to save the file.

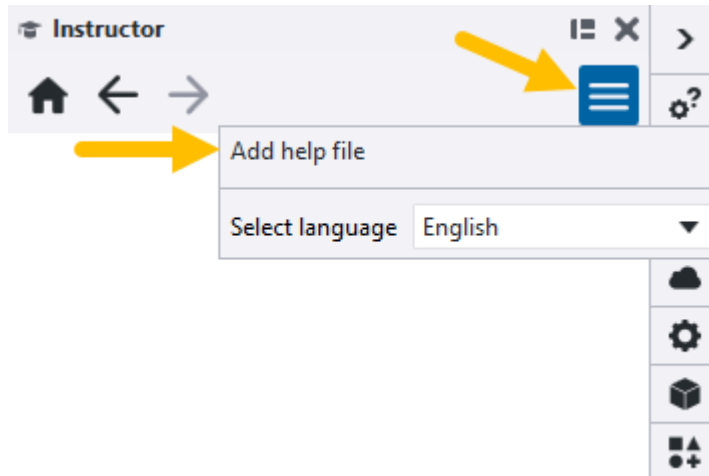
By default, the file is stored in the `\local\temp` folder for the model.

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** pane shows content when you select an item. The information is especially useful for giving advice to your users about how to choose the right component, 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 for which you want to add help in the **Applications & components** catalog.
2. In the **Instructor** pane, click the menu, then select **Add help file.**



A dialog opens for creating the necessary files according to your selections.

3. Click **Next**, then select one or more languages.

Select the languages that are used as Tekla Structures user interface languages in your company. There must be a content file for each language even if you do not translate the content.

4. Click **Next**, then 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 \(page 58\)](#) is followed.

If you want to distribute the files to users, we recommend that you store the files in the project or firm folder.

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 the files into language-specific folders. The XML file and the root folder for the content are named according to the identifier of the tool that the help is for. 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 files in your preferred tool, such as Visual Basic, or replace the files with your own HTML files with the same file names.

You can optionally add the instructor help files to the .tsep package for your extension so that the instructor help is automatically added when users install the .tsep package. You can use the wildcard character (*) in the project definition .xml file to add all files in the specified folder. For example:

```
<TargetPathVariables>
  <PathVariable Id="HelpDirectory" Value="%ENVDIR%
```

```

\common\extensions\MyExtension\"/>
</TargetPathVariables>

<Component Id="ExampleExtension" Guid="4902568A-2195-4B38-BBA4-
BEB56A2ABECF">
  <File Id="HelpFilesToCopy" Source="%TSEPDEFINITIONFILEFOLDER%
\plugin\*" Target="%HelpDirectory%" />
</Component>

```

See also

[Complete guide to TSEP: Creating Tekla Structures extension packages](#)

4.9 Create customized desktop shortcuts for Tekla Structures

To use the correct `.ini` files for a specific project, you can create shortcuts to start `teklastructures.exe` with customized initializations.

You can create desktop shortcuts for different purposes, for example, to have customized setup files depending on the client that 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 desktop shortcuts. Otherwise, your settings might 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 for start-up parameters and default settings \(page 62\)](#).

Create a desktop shortcut for Tekla Structures with customized initializations

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\"

The screenshot shows the 'Properties' dialog box for a shortcut, with the 'Target' tab selected. The fields are as follows:

- Target type:** Application
- Target location:** bin
- Target:** `teklaStructures.exe" -i "C:\MyProject\project1.ini"`
- Start in:** `"C:\Program Files\TeklaStructures\2022.0\bin\"`
- Shortcut key:** None
- Run:** Normal window (dropdown menu)
- Comment:** (empty text box)

At the bottom, there are three buttons: 'Open File Location', 'Change Icon...', and 'Advanced...'.

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 desktop shortcuts for Tekla Structures

You can use these parameters in desktop shortcuts for Tekla Structures.

You can use the parameters in combinations. For example, you can set the parameters to automatically bypass the **Tekla Structures - Setup** dialog, 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 - Setup dialog (the sign in dialog). Example: <pre>"C:\Program Files\Tekla Structures\<version>\bin\TeklaStructures.exe" -I "C:\ProgramData\Trimble\Tekla Structures\<version>\Environments\uk\Bypass.ini"</pre>
-i <ini_file_path>	The given .ini file is loaded after the role .ini files. This parameter can be specified multiple times. Example: <pre>"C:\Program Files\Tekla Structures\<version>\bin\TeklaStructures.exe" -i "C:\TeklaStructures\MySettings.ini"</pre>
To open an existing model <model_path>	The given model is opened after startup. Example: <pre>"C:\Program Files\Tekla Structures\<version>\bin\TeklaStructures.exe" "C:\TeklaStructuresModels\My model"</pre>
To open an existing, autosaved model <model_path> / autosaved	The given autosaved model is opened after startup. Example: <pre>"C:\Program Files\Tekla Structures\<version>\bin\TeklaStructures.exe" "C:\TeklaStructuresModels\My model" / autosaved</pre>

Parameter	Description
To create a new model without a model template / create:<model_path>	A new model is created after startup. 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 startup. 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 startup. Example: "C:\Program Files\Tekla Structures\<version>\bin\TeklaStructures.exe "/create:"C:\TeklaStructuresModels\My model" /server:"my-server:1234"
To run a macro after startup -m <macro_file_path>	The given macro is executed after startup. 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

You can bypass the sign in dialog by creating a desktop shortcuts for Tekla Structures 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 license server address. For Tekla Structures online 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 [company's account for products and services \(page 436\)](#).
- Manage access to [subscriptions \(page 437\)](#) for users in your company's account.
- Install service packs or new Tekla Structures versions to [upgrade \(page 437\)](#).
- [Management of the company's account for Tekla products and services \(page 436\)](#)
- [Management of Tekla Structures subscriptions \(page 437\)](#)
- Tekla Structures upgrades for administrators
- AI Cloud Fabrication drawings (Preview): Make a drawing collection public

5.1 Management of the company's account for Tekla products and services

Each company has at least one Tekla license administrator who is responsible for managing users and licenses in the company's account (group) for Tekla products and services.

Several people in your company can be license administrators. The first administrator is invited by a Trimble representative, and that person is then responsible for adding other users and administrators.

As a license administrator, you:

- Invite or approve users as employees to your company's account to allow them unrestricted access in all online services for Tekla products.

- Invite external users to your company's account as members.
- Select which users have access to your company's Tekla Structures subscriptions.
- Remove the employee role from users or remove users from your company's account 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.

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 sign in to Tekla Structures. Administrator users can monitor subscription usage, and assign subscriptions and access rights to users in the [Tekla Online Admin Tool](#).

For instructions, see [Manage Tekla Structures subscriptions](#).

5.3 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. Tekla Structures subscriptions automatically allow you to use any Tekla Structures version that is released during your subscription period.

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.

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 \(page 17\)](#) 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 \(page 47\)](#) work.

5.4 AI Cloud Fabrication drawings (Preview): Make a drawing collection public

The localized fabrication drawing collections need to be accessible by the users of the different environments. However, collections are only accessible by invitation (email) or by making them available to your company's account. To allow anyone using a certain role or environment to access a collection, the administrator needs to make the collection "Public". This action is reserved only for the administrators in the Management Console.

Make a fabrication drawing collection public

1. Create and populate a new collection using the AI Cloud Fabrication drawings service.
2. Locate and copy the GUID of the new collection:
 - a. On the **Drawings & reports** ribbon tab, go to **AI Cloud Fabrication drawings** --> **Collections** and select the collection you want to localize, so it becomes active.
 - b. In the model folder, open the `FabCollectionSettings_<username>.xml` in the `\attributes` folder in a text editor. The content of the file should look like this, and the part between `<ActiveCollectionGuid>` and `</ActiveCollectionGuid>` is the GUID:

```
<?xml version="1.0"
encoding="utf-8"?><XmlCollectionSettings><ActiveCollectionGuid>38b72ad0-
df40-4630-96d4-a94197d717c5</ActiveCollectionGuid><InactiveLibraries /
><LibraryLayouts/></XmlCollectionSettings>
```

3. Copy the GUID.
4. Open the Management Console: Go to <https://console.permissions.tekla.com/> or click the **Share** button in the **Collections** dialog.
5. Search for the new collection.
6. Change the access to **Public**.
7. Make the collection visible to all users of a specific environment or role:

You need to decide if you want to have different collections for different roles. For example, you might not want steel users to have a collection that contains many cast unit drawing libraries. This would make navigation harder, and might also slow down the drawing creation unnecessarily. The system is file based, and works similarly to the

localization of other features. The file location determines which roles have access to a collection.

- a. Create a file called `FabDrawingLocalizedCollections.txt` in a relevant subfolder in the environment, for example, the one defining a role, and open the file in a text editor.

NOTE: The first file with this name found in the paths defined in the role .ini files will be used by Tekla Structures to add a collection to the list of available ones in the dialog.

- b. Paste the GUIDs of all the relevant collections (copied from the `FabCollectionSettings_<username>.xml` file) to be shown to the user of that role in this file, one GUID per one line.

Empty lines and lines starting with the "#" character are ignored and considered as text comments (for example, to tell the name of the collection associated with each GUID).

- c. Save the file.

Example of the file content:

```
# Default Sample Collection
38b72ad0-df40-4630-96d4-a94197d717c5

# Example France cast-in-place
2706c362-bc72-4b23-a707-25fc713d9b5b # plan de coffrage
e2ff5584-5ae5-4582-a7bc-2457fc1f8acd # plan de
ferraillage

# Example France precast
7f44198e-12b5-4a71-b4dc-8dea50d3da89
```

The above example file defines 4 collections. If the file is located, for example, under the steel detailer role's subfolders, the collections will only be seen and be available in the **Collections** list for users who have started Tekla Structures using the steel detailer role.

6 Disclaimer

© 2026 Trimble Inc. and affiliates. All rights reserved.

Use of the Software and of this Software Manual are governed by a License Agreement which determines whether you are an authorized user of the Software and the Software Manual. The warranties and disclaimers set forth in the License Agreement apply to the Software and the Software Manual. Neither the Trimble entity granting the license nor any of its affiliates assume responsibility that the text is free of technical inaccuracies or typographical errors. The right to make changes and additions to this manual is reserved.

Trimble and certain product names are registered trademarks of Trimble Inc. in the United States, the European Union and other countries and may have similar statutory protections. Trademarks of third parties are not mentioned in this Manual to suggest an affiliation with or endorsement by their owners.

Elements of the software described in this Manual may be the subject of pending patent applications in the European Union and/or other countries.

Portions of this software:

Portions of this software make use of Open CASCADE Technology software. Open Cascade Express Mesh Copyright © 2019 OPEN CASCADE S.A.S. All rights reserved.

FLY SDK - CAD SDK © 2012 VisualIntegrity™. All rights reserved.

This application incorporates Open Design Alliance software pursuant to a license agreement with Open Design Alliance. Open Design Alliance Copyright © 2002–2020 by Open Design Alliance. All rights reserved.

CADhatch.com © 2017. All rights reserved.

RapidXml C++ library © All rights reserved.

FlexNet Publisher © 2016 Flexera Software LLC. All rights reserved. This product contains proprietary and confidential technology, information and creative works owned by Flexera Software LLC and its licensors, if any. Any use, copying, publication, distribution, display, modification, or transmission of such technology in whole or in part in any form or by any means without the prior express written permission of Flexera Software LLC is strictly prohibited. Except where expressly provided by Flexera Software LLC

in writing, possession of this technology shall not be construed to confer any license or rights under any Flexera Software LLC intellectual property rights, whether by estoppel, implication, or otherwise.

To see the third party open source software licenses, go to Tekla Structures, click **File menu --> Help --> About Tekla Structures --> 3rd party licenses** and then click the option.

Index

-
- .tsep packages
 - automatic installation..... 35
 - central deployment..... 35
 - importing..... 35
 - installing..... 35
 - uninstalling..... 35

A

- account..... 436
- adding
 - bolt assemblies to catalog..... 394
 - bolts to catalog..... 394
 - material grades..... 285
 - profiles..... 330
 - stud bolts to catalog..... 394
 - user attributes to material grades..... 285
 - user attributes to profiles..... 307
 - user-defined attributes to Template Editor..... 234
- administrators
 - advanced options..... 285
 - applications & components..... 419
 - bypassing..... 285
 - collaborative modeling..... 244
 - company..... 45,47
 - customizing..... 45,47,285
 - starting projects..... 159
 - environment..... 45,47
 - getting started..... 9
 - initialization files..... 285
 - installation..... 26
 - licenses..... 437
 - organizations..... 436
 - project..... 45,159
 - registry keys..... 156
 - registry settings..... 156
 - roles..... 45
 - routine tasks..... 436

- setting up..... 45
- setting up..... 47
- setting up..... 159
- subscriptions..... 437
- tekla model sharing..... 244
- tekla online..... 436
- trimble connect..... 244
- user-defined attributes..... 285
- advanced options..... 62
 - storing settings..... 133
- AI Cloud Fabrication drawings
 - making collections public..... 438
- AIL files
 - message files..... 91
- API..... 157
- applications & components
 - .tsep packages..... 35
 - extensions..... 35
 - tsep packages..... 35
- applications and components
 - adding instructor help..... 419
- arcs
 - sketching in sketch editor..... 344
- assemblies
 - bolt assemblies..... 393,394
 - bolt catalog..... 393
 - in templates..... 194
- attributes
 - in bending schedules..... 214
 - in templates..... 233
- autosaving
 - models
 - drawings..... 134

B

- bending schedules
 - attributes and values..... 214
- bim managers
 - getting started..... 9
- bolt assemblies

exporting.....	398
importing.....	398
bolt assemblies.....	394
bolt catalog.....	393
deleting.....	394
modifying.....	394
properties.....	407
bolt assembly catalog.....	393
bolt assembly elements	
bolt catalog.....	393
bolt catalog.....	393
open the bolt catalog.....	393
bolts	
adding bolt assemblies to catalog.....	394
adding to catalog.....	394
bolt assemblies.....	394
bolt assemblies.....	393
bolt assembly catalog.....	393
bolt catalog.....	393
creating studs.....	394
deleting from catalog.....	394
exporting.....	398
importing.....	398
length calculation.....	402
modifying bolt information.....	394

C

calculating	
bolt length.....	402
calculations.....	239
catalog files.....	96
catalogs	
bolt assembly catalog.....	393,407
bolt catalog.....	393,405
creating.....	285
distributing.....	285
exporting material catalog.....	285
material catalog.....	285
profile catalog.....	293
profile catalog.....	307
chamfers	
in sketching.....	359,362
checking	
sketched profiles.....	358
circles	
sketching in sketch editor.....	344
clash check	

settings in Options dialog.....	134
CLB files.....	334
cloning data	
log.....	102
cloud environment.....	45
CNV files	
contents.....	254
creating.....	254
CNV files	
font conversion.....	98
coincident constraints.....	346
collections	
cloud fabrication drawings.....	438
making public.....	438
comments	
in templates.....	234
company account.....	436
company.ini.....	62
components.clb.....	334
components	
settings in Options dialog.....	134
composites.....	285
compressing	
shape geometry files.....	391
constraints	
coincident.....	346
deleting.....	346
fixed.....	346
horizontal.....	346
in sketching.....	346
parallel.....	346
perpendicular.....	346
vertical.....	346
content types	
rows.....	230
templates.....	230
contentattributes.lst.....	234
contentattributes_userdefined.lst.....	234
conversion files	
contents.....	254
creating.....	254
material conversion.....	254
profile conversion.....	254
twin profile conversion.....	254
converting	
profiles.....	330
copying	
material grades.....	285

profiles.....	330
creating	
cross sections.....	319
customized initialization files.....	430
graphical templates.....	197
HTML templates.....	210
profiles.....	319,330,334,341
report templates.....	184
shapes from geometry.....	373
shortcuts.....	430
sketched profiles.....	344
studs.....	394
textual templates.....	184
title blocks.....	197
cross sections	
creating.....	319
defining.....	319
modifying.....	319
profiles with variable cross sections...	367
user-defined.....	319
custom tabs.....	53
customized initializations.....	430
customizing	
administrators.....	44
message files.....	91
property pane settings.....	56
property pane layout.....	55
ribbons.....	51
tabs.....	53
toolbars.....	57
user-defined attributes.....	164

D

DAT files.....	89
data files.....	89
date	
formats.....	239
decimals	
settings in Options dialog.....	134
defining	
cross sections.....	319
flat bar sizes.....	73
unfolding parameters.....	75
deleting	
bolt assemblies.....	394
bolts from catalog.....	394
material grades.....	285

dimensions	
default format.....	134
default precision.....	134
default unit.....	134
in sketching.....	349,362
settings.....	134
settings in Options dialog.....	134
distributing	
customized property pane settings.....	56
customized property pane layouts.....	55
customized ribbons.....	51
customized tabs.....	53
customized toolbars.....	57
drawing history	
log.....	102
drawing objects	
settings in Options dialog.....	134
drawing sheet numbers	
templates.....	239
DWG files	
adding in graphical templates.....	221
in title blocks.....	221
symbols.....	99
DWG profile to library (6).....	319
properties.....	319

E

enterprise companies	
getting started.....	9
environment settings	
global default	68
local.....	69
environment variables.....	133
environment.db.....	164
environments	
administrators.....	45,47
database file.....	164
env_<environment>.ini.....	62,69,155
env_global_default.ini.....	62,155
env_global_default.ini	68
examples	
adding dimensions to sketched profile....	362
adding user attributes to profiles.....	307
creating user-defined attribute.....	164
flat bar sizes.....	73

modifying chamfers in sketched profile	362
profile export file.....	301,314
setting sketch thickness.....	362
sketching symmetric C-shaped profile....	362
updating user-defined attribute.....	164
using sketched profile in model.....	362
exporting	
bolt assemblies.....	398
bolts.....	398
groups from shape catalog.....	389
material grades.....	285
profiles.....	301,314
rebar definitions.....	413
reinforcement.....	413
shapes.....	389
sketched profiles.....	314
extensions	
automatic installation.....	35
central deployment.....	35
importing.....	35
installing.....	35
Tekla Open API.....	157
uninstalling.....	35
extrusion types.....	359

F

fiberglass.....	285
file name extensions.....	110
file types	
catalog files.....	96
data files.....	89
font files.....	98
image files.....	101
initialization files.....	62
input files.....	72
layout definition files.....	99
log files.....	102
message files.....	91
profile files.....	96
property files.....	92
report files.....	99
shape definition files.....	372
standard files.....	92
symbol files.....	99
template files.....	99

files.....	57
conversion files.....	254
extensions.....	110
in model folder.....	110
initialization files.....	62
locations.....	61
material conversion files.....	254
profile conversion files.....	254
symbol.....	99
twin profile conversion files.....	254
files related to	
environments.....	14
software.....	14
user settings.....	14
firm folders.....	17
fixed constraints.....	346
fixed profiles.....	330
flat bars	
in drawings	73
in reports.....	73
sizes.....	73
fltprops.inp.....	73
folders.....	57
in model folder.....	110
locations.....	61
search order.....	58
FON files	
fonts.....	98
font files.....	98
fonts.....	98
fonts_<lang>.ini.....	62
format functions	
templates.....	239
formats	
date in templates.....	239
formulas	
format functions.....	239
free attributes.....	214

G

getting started	
administrators.....	9
bim managers.....	9
enterprise companies.....	9
freelancers.....	9
it administrators.....	9
small companies.....	9

glass.....	285
global default environment settings.....	68
graphical templates	
creating.....	210
graphical templates	
creating.....	197
graphical templates	
adding DWG files.....	221
pull-out pictures.....	214
grouping	
profiles.....	293,307
groups	
in rebar catalog.....	411
in shape catalog.....	374

H

handles	
of positioning planes.....	353
hidden files and folders	
location.....	14
hiding	
positioning planes.....	353
hierarchy	
in templates.....	234
horizontal constraints.....	346
HTML templates	
creating.....	210
HTML files	
instructor.....	419
html.rpt extension.....	210

I

IFC files	
defining property sets in export.....	258
image files.....	101
images	
file formats.....	101
in templates.....	227
of profile in profile catalog.....	370
imperial units	
template value fields.....	239
templates.....	239
import items.....	386
importing	
.tsep packages.....	35

bolt assemblies.....	398
bolts.....	398
extensions.....	35
groups to shape catalog.....	386
material grades.....	285
model.....	160
profiles.....	301,314
rebar definitions.....	413
reinforcement.....	413
shapes.....	386
sketched profiles.....	314
SketchUp.....	388
tsep packages.....	35
indexterm.....	100
INI files.....	62
env_<environment>.ini.....	155
env_global_default.ini.....	68,69,155
options.ini.....	155
role_<role>.ini.....	155
INI files.....	62,430
options.ini.....	133
role_<role>.ini.....	69
user.ini.....	70
initialization files.....	62
creating customized.....	430
defining advanced options.....	62
env_<environment>.ini.....	69
env_global_default.ini.....	68
file types.....	62
reading order.....	62
role_<role>.ini.....	69
usage.....	62
INP files.....	72,171
adding UDAs to Template Editor.....	234
unfolding.....	75
input files.....	72
installation	
planning.....	12
requirements.....	12
installing Tekla Structures	
administrators.....	26
installing Tekla Structures	
configurations.....	13
environments.....	13
installation folders.....	14
roles.....	13
installing	
.tsep packages.....	35

extensions.....	35
tsep packages.....	35
instructor	
adding help for applications and components.....	419
it administrators	
getting started.....	9

L

lang_<lang>.ini.....	62
LAY files	
layout definitions.....	99
layout definition files.....	99
length	
bolt length calculation.....	402
licenses	
administrators.....	437
managing.....	437
load defaults.....	92
load modeling	
settings in Options dialog.....	134
local environment settings	
env_<environment>.ini.....	69
locations	
files.....	61
folders.....	61
of hidden files.....	14
log files	
list of.....	102
numberinghistory.log.....	102
session history.....	102
viewing.....	102
viewing parts or assemblies.....	102
LST files	
user-defined attributes.....	234

M

management.....	436
managing	
licenses.....	437
organizations.....	436
subscriptions.....	437
material conversion files.....	254
materials	
adding.....	285

adding user attributes.....	285
catalog.....	285
copying.....	285
deleting.....	285
exporting.....	285
grades.....	285
importing.....	285
material types.....	285
modifying.....	285
user-defined material symbols.....	285
message files	
customizing.....	91
Migration Wizard.....	70
model folder	
file name extensions.....	110
files.....	110
model-specific settings.....	155
models	
importing.....	160
problems in opening.....	160
modifying	
bolt assembly information.....	394
bolt information.....	394
cross sections.....	319
material grades.....	285
profile with variable cross sections.....	367
profiles.....	330
rules in profile catalog.....	307
sketched profiles.....	359
mouse	
settings in Options dialog.....	134

N

new profile catalog	
profiles	
creating.....	319
user-defined.....	319
user-defined profiles.....	319
non-solid shapes	
importing.....	386
north marks	
settings in Options dialog.....	134
numbering history.....	102
numbering	
settings in Options dialog.....	134

O

objects.inp.....	171,173,234
OPT files	
standard.opt.....	133,134
Options dialog	
settings.....	134
options.bin.....	62,133,155
options.ini.....	62,155
options	
saving.....	133
storing.....	133
options_drawings.db.....	133,134,155
options_model.db.....	133,134,155
organizations	
administrators.....	436
managing.....	436
orientation marks	
settings in Options dialog.....	134

P

parallel constraints.....	346
parametric profiles.....	369
creating.....	341
parametric	
profiles.....	334
parts	
defining the material of profile types.....	307
deleting	
profiles.....	307
PDF reports	
templates.....	212
performance	
templates.....	239
perpendicular constraints.....	346
pictures	
in templates.....	227
plastic.....	285
plates	
flat bars.....	73
plotdev.bin.....	99
point clouds	
sharing.....	249
polylines	
sketching in sketch editor.....	344
positioning planes.....	353
moving.....	353

reverting to default.....	353
printing data	
log.....	102
product.....	436
profile catalog, see profiles.....	307
profile catalog, see profiles.....	293
profile conversion files.....	254
Profile cross section from plate (10).....	319
profile files.....	96
profiles	
adding rules.....	307
adding user attributes.....	307
associating with materials.....	307
converting.....	330
copying.....	330
creating.....	319,330,334,341
creating image of profile.....	370
defining cross sections.....	319
deleting.....	293,307
exporting.....	301,314
fixed.....	330
grouping.....	293,307
importing.....	301,314
modifying.....	330
parametric.....	334
profile catalog.....	307
profile catalog.....	293
Profile Editor.....	367
profile export file.....	301,314
rules.....	307
saving changes.....	307
sketching.....	341
user-defined.....	319
with variable cross sections.....	367
profitab.inp.....	334
properties.....	334
project folders.....	17
project settings management console.....	45
projects	
transferring customized files.....	160
properties	
bolt assembly catalog.....	407
bolt catalog.....	405
DWG profile to library (6).....	319
objects.inp.....	173
Profile cross section from plate (10)...	319
profitab.inp.....	334
property files.....	92

property pane settings	
customizing.....	56
property pane editor.....	55,56
property pane layouts	
customizing.....	55
property sets	
defining in IFC export.....	258
publishing groups in Applications & components catalog.....	419
pull-out pictures	
bending schedules.....	214

R

reading order	
initialization files.....	62
reading order	
folders.....	58
rebar catalog.....	408
filtering.....	414
organizing.....	414
sorting.....	414
stars.....	414
tags.....	414
rebar definitions	
exporting.....	413
importing.....	413
rebar catalog	
definitions.....	409
groups.....	411
rebar definitions.....	409
reference models	
adding UDAs.....	171
registry keys.....	156
registry settings.....	156
reinforcement	
exporting.....	413
importing.....	413
rebar catalog.....	408
removing	
.tsep packages.....	35
extensions.....	35
tsep packages.....	35
report files.....	99
reports	
creating templates.....	184
date.....	239
tips.....	239

reverting	
to default positioning planes.....	353
ribbon editor.....	51,53
ribbons	
customizing.....	51
role settings.....	69
roles.....	69
administrators.....	45
role_<role>.ini.....	62,69,155
rows	
content types.....	230
RPT files	
report templates.....	99
textual templates.....	181
RPT templates.....	184
rules	
in profile catalog.....	307
profile catalog rules.....	307

S

save defaults.....	92
save and load properties.....	92
saving	
advanced options.....	133
graphical templates.....	197
options.....	133
profiles.....	307
sketched profiles.....	358
templates.....	184
search order	
folders.....	58
session history.....	102
setting up	
administrators.....	44
settings	
autosaving.....	134
bolt assembly catalog properties.....	407
bolt catalog properties.....	405
clash check.....	134
components.....	134
decimals.....	134
dimensions.....	134
drawing objects.....	134
general.....	134
general settings in Options dialog.....	134
in the Options dialog.....	134
load modeling.....	134

mouse.....	134	example: creating symmetric C-shaped profile.....	362
north marks, see orientation marks...	134	example: modifying chamfers.....	362
orientation marks.....	134	example: setting sketch thickness.....	362
startup.....	134	example: using sketched profile in model.....	362
units.....	134	exporting.....	314
units and decimals.....	154	extrusion types.....	359
shape catalog		importing.....	314
importing shapes.....	386	modifying.....	359
shape catalog		polylines.....	344
filtering.....	382	positioning planes.....	353
groups.....	374	refining the shape.....	346
organizing.....	382	saving.....	358
sorting.....	382	setting the thickness.....	359
stars.....	382	sketch editor.....	341
tags.....	382	sketching the outline.....	344
shape catalog.....	372,389	using in model.....	359
shape cleaner.....	391	sketching, see sketched profiles.....	341
shape definition files		small companies	
shape catalog.....	372	getting started.....	9
shapes		solid shapes	
cleaning.....	391	importing.....	386
compressing geometry files.....	391	standard files	
creating.....	373	loading.....	92
deleting.....	374	saving.....	92
exporting.....	389	standard.opt.....	133,134
from geometry.....	373	standardized values	
grouping.....	374	for parametric profiles.....	369
importing.....	386	startup	
modifying properties.....	374	settings in Options dialog.....	134
shape catalog.....	372	stone.....	285
sharing		storing	
point clouds.....	249	advanced options.....	133
shortcuts		options.....	133
creating.....	430	studs.....	394
showing		subscriptions.....	436
positioning planes.....	353	administrators.....	437
Sketch Browser.....	341	managing.....	437
sketch editor.....	341	SYM files	
sketched profiles.....	341	symbols.....	99
adding constraints.....	346	symbol files.....	99
adding dimensions.....	349	system-specific settings.....	155
arcs.....	344		
chamfers.....	359		
checking.....	358		
circles.....	344		
deleting constraints.....	346		
deleting dimensions.....	349		
example: adding dimensions.....	362		
		T	
		tabs	
		importing customized tabs.....	53

tekla online	
administrators.....	436
organizations.....	436
Tekla Model Sharing	
cache service.....	245
Tekla Open API	
extensions.....	157
Tekla Structures files.....	57
Tekla Structures folders.....	57
teklastructures.ini.....	62
TeklaStructures_<user>.log.....	102
template attributes.....	233
Template Editor.....	181,184
template files.....	99
templates	
adding images.....	227
aligning objects.....	194
attributes.....	233
bending schedules.....	214
content types.....	230
creating.....	210
creating textual templates.....	184
creating graphical.....	197
creating report templates.....	184
date.....	239
date formats.....	239
drawing sheet numbers.....	239
format functions.....	239
free attributes.....	214
graphical.....	181
graphical templates.....	210,214,227
graphics.....	239
headers and footers.....	210
headers and footers.....	194
imperial units.....	239
in HTML format.....	210
moving objects.....	194
of bending schedules.....	214
of nested assemblies.....	194
performance issues.....	239
rows.....	230
saving.....	184,197
sorting order.....	194
textual.....	181
textual templates.....	194
tips.....	239
user-defined attributes.....	234
testing	
sketched profiles.....	358
text type attributes	
in calculations.....	239
textual templates.....	194
TEZ files.....	391
importing.....	386
shape catalog.....	372
thickness	
sketch thickness.....	359,362
tips	
templates and reports.....	239
title blocks	
creating.....	197
out of DWG files.....	221
toolbars	
customizing.....	57
TPL templates.....	197
TPL files	
drawing templates.....	99
graphical templates.....	181
Trimble Connect	
firm folders.....	23
project folders.....	23
troubleshooting	
errors in model or parts.....	160
model not opening.....	160
tsep packages	
automatic installation.....	35
central deployment.....	35
importing.....	35
installing.....	35
removing.....	35
uninstalling.....	35
TTF files	
fonts.....	98
twin profile conversion files.....	254
 U	
UDAs	
adding to Template Editor.....	234
unfolding	
INP files.....	75
parameters.....	75
parts.....	75
unfold_corner_ratios.inp.....	75
uninstalling	
.tsep packages.....	35

tsep packages.....	35
units and decimals.....	154
units	
in importing and exporting.....	314
in material catalogs.....	285
settings in Options dialog.....	134
updating	
user-defined attributes in model.....	164
updating	
material catalog.....	285
profile catalog.....	307
upgrading Tekla Structures	
administrators.....	437
user attributes	
adding to material grades.....	285
adding to profiles.....	307
user-defined attributes	
customizing.....	164
environment.db.....	164
example.....	164
updating in model.....	164
user-defined attributes	
adding in reference models.....	171
in templates.....	234
objects.inp properties.....	173
user-defined material symbols	
creating.....	285
user-defined profiles.....	319
user-specific settings.....	155
user.ini.....	62
modifying.....	70
users.....	436

V

value fields	
format functions.....	239
imperial units.....	239
variable cross sections.....	367
variables	
in sketching.....	341
vertical constraints.....	346
viewing parts or assemblies	
in log files.....	102
viewing	
log files.....	102
virtual use of Tekla Structures.....	40
virtualization.....	40

X

XML files	
instructor.....	419
message files.....	91
shape catalog.....	372
XML to TEZ.....	391
XS_FIRM	
fixed sub-folders.....	17
XS_PROJECT	
fixed sub-folders.....	17