Tekla Structures 2023

Release notes 2023

April 2023

Contents

1 Tekla Structures 2023 release notes

Welcome to Tekla Structures 2023!

Tekla Structures 2023 continues to improve the user experience. The 2023 version makes it easier for both new and existing users to quickly learn and adopt the software's time-saving functionalities. The upgraded user experience for working with drawings makes the software easier to learn and use.

Tekla Structures 2023 improves the project communication and advanced detailing in fabrication workflows. In rebar detailing, complex bar shape designs are now easier to communicate to procurement, manufacturing and the construction site. Our customers in steel fabrication now benefit from being able to cover even more detailing options with bolts and holes for specialized industries. The outputs and exports serving detailing for the fabrication of many project and material types have been updated too. Better project location coordinate handling, support for drawing versions in Tekla Model Sharing, and more reliable IFC export improve the project coordination and collaboration.

Scroll down or use the PDF bookmarks to navigate to the features that interest you.

Service packs

Follow the links below for information on new features, improvements and fixes made in each currently available service pack:

- Tekla Structures 2023 SP1 (page 103)

Compatibility

We suggest that you complete any unfinished models using your current version of Tekla Structures.

This version is not backwards compatible. When you create or save a model in Tekla Structures 2023, you cannot open it in older versions due to database differences.

See the hardware recommendations for information on supported operating systems.

Administrator's release notes

Advanced users should read the Tekla Structures administrator's release notes (page 107) for information on how to apply the additional customizations available in this release.

Localization release notes

Environment-specific changes are explained in the Localization release notes (page 126).

Tekla Open API release notes

The Tekla Open API release notes can be found in the Tekla Developer Center.

Release notes summary across Tekla Structures versions

The Release notes summary across Tekla Structures versions provides an overview to the new features and improvements in Tekla Structures versions and service packs for Tekla Structures version 2018 and newer. The summary is available in English only.

2 New property pane in drawings

In Tekla Structures 2023, you will experience a more streamlined way of working in drawing mode as most drawing objects now have a property pane instead of dialog boxes. The property pane is a side pane window, where drawing object properties are accessible in one place. As usual in Tekla Structures, you can customize the drawing property pane separately for each object type to suit your needs.

The drawing property pane provides a consistent user interface with modeling mode, and a modern and powerful method to handle drawing object properties in Tekla Structures. The drawing property pane offers a smooth workflow for creating and modifying drawing objects, for saving and loading drawing object properties, and for copying properties between objects. The drawing property pane also introduces a visual editor for dimension tags, view labels, associative notes, and most mark types.

To learn more, see the drawing property pane video in Highlights of Tekla Structures 2023 > New property pane for intuitive drawing editing.

Supported object types

Now you can use the property pane to view and modify the properties of the following drawing object types:

- All dimension types: straight dimensions, rebar dimension marks, curved dimensions, radial dimensions, and angle dimensions
- All annotation types: part marks, bolt marks, weld marks, drawing weld marks, pour object marks, rebar marks, merged rebar marks, surface treatment marks, connection marks, level marks, section marks, detail marks, associative notes, and texts
- Building objects: parts, bolts, welds, pour breaks, pour objects, rebars, rebar meshes, surface treatment, and reference objects
- Sketch objects: lines, polylines, arcs, polygons, rectangles, circles, and clouds
- Grids and grid lines

- Views. The property pane only allows you to view and modify the properties that are directly related to views. For example, you cannot access the view level object or mark properties through the property pane.

  Note that the drawing view property pane loads from the property file only values for properties that available in the property pane. If you want to load properties for all object types included in the drawing view, double-click the view frame to open the view properties dialog box, and load the needed object properties there.

The following object types are not currently supported in the drawing property pane: symbols, revision marks, DWG/DXF files, images, text files, edge chamfers, drawing links, and hyperlinks.

Note that the names of some properties or property groups might have changed since the old dialog boxes.

Feature summary and main benefits

The new drawing property pane has several benefits compared to the previously used property dialog boxes:

- The property pane is always up to date. When you select an object in the drawing, the current properties are instantly shown in the property pane.
- There is less clutter on the screen because there is no need to have separate dialog boxes open as previously.
- You can easily create drawing objects that are similar to the drawing objects that already exist in the drawing.
- You can easily check which properties you are about to modify in the property pane. Tekla Structures highlights the changed properties in yellow in the property pane and a check mark appears next to the modified property.
- You only need to click **Modify** to change the modified properties.
- You no longer need to use the **Apply** button for applying of properties for the next objects of the same type if you have selected the **Set default values automatically** option. However, you can switch from automatic to manual applying with the **Set as default** option at any time if you prefer to work that way.
- It is easy to copy properties from one drawing object to another. You can copy properties between any objects as long as both objects have the same property available. For example, you can copy the text color from a mark to another mark.
- When you select several objects in a drawing, you can check if the objects have common properties and what the values of the common properties are, and modify the properties, if needed.
- To make the property pane still easier to navigate, you can set properties to frequently or infrequently used state in **Property pane editor**, which allows you to decrease the number of properties visible in the property

pane, but also quickly see all properties when needed. Then when using the property pane, you can choose to display just frequently used properties or all properties with a single click.

- The visual editor for view labels, dimension tags, notes, and marks provides a WYSIWYG control over the content. In the preview, you can see the actual attribute values and the representation that you have defined for your content before adding it to the drawing.
- You can customize the property pane: for example, you can organize the settings as you wish and remove the settings you do not need. You can select separately for each object type which properties you wish to see in the property pane.

How to open the drawing property pane

To open the drawing object properties in the property pane, do one of the following:

- If the property pane is closed: double-click a drawing object, or click the  **Properties** button in the side pane.
- If the property pane is open: click a drawing object.
- Hold down **Shift** and click a command on the ribbon.
- Double-click a command on the ribbon.

You can only have one property side pane window open at a time. This means that you can view the properties of only one object type at a time. Previously, when you used the dialog boxes, you could have the dialog boxes of several object types open at the same time, for example, dimension properties and part mark properties. This is not possible with the property pane.

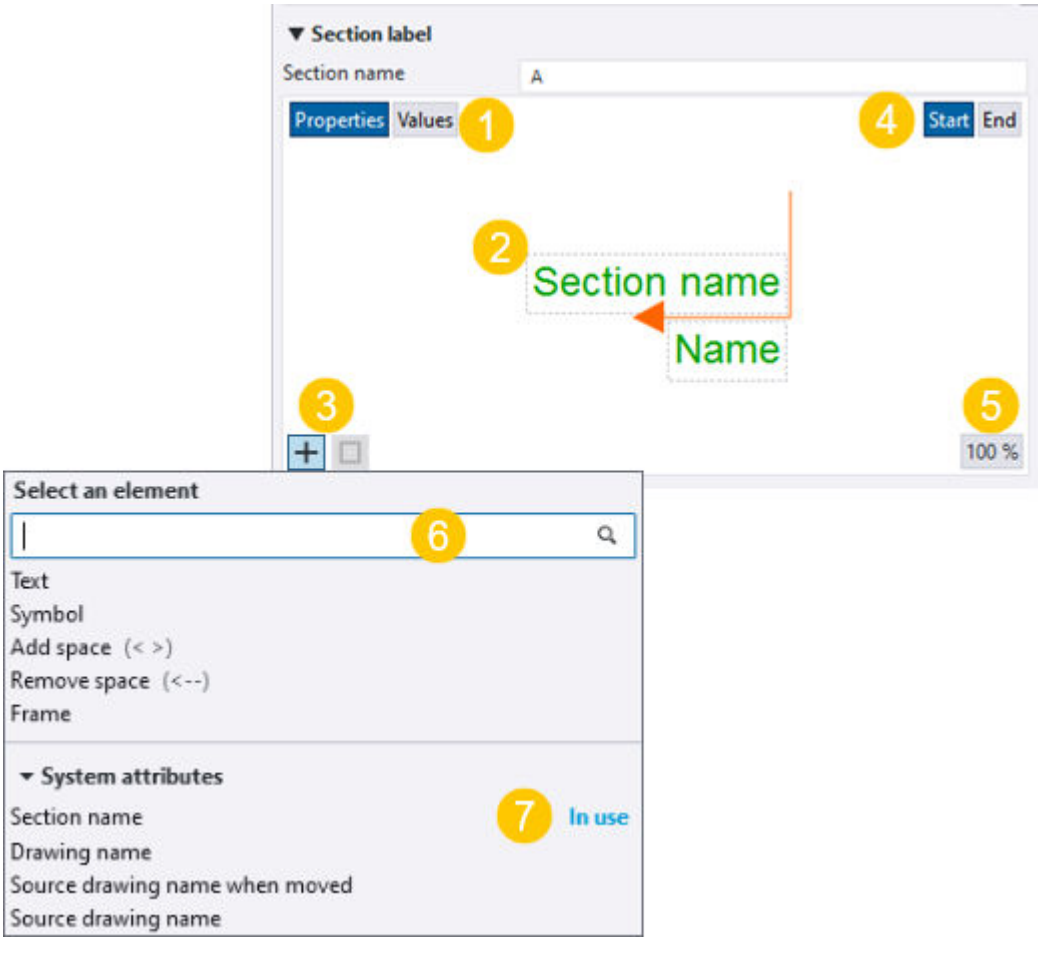
You can float or dock the property pane in the same way as any other side pane window, or drag it around your screen or to your secondary screen, if you have multiple displays.

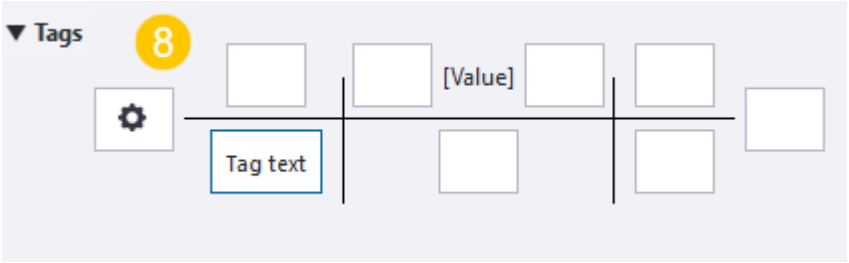
2.1 Visual editor

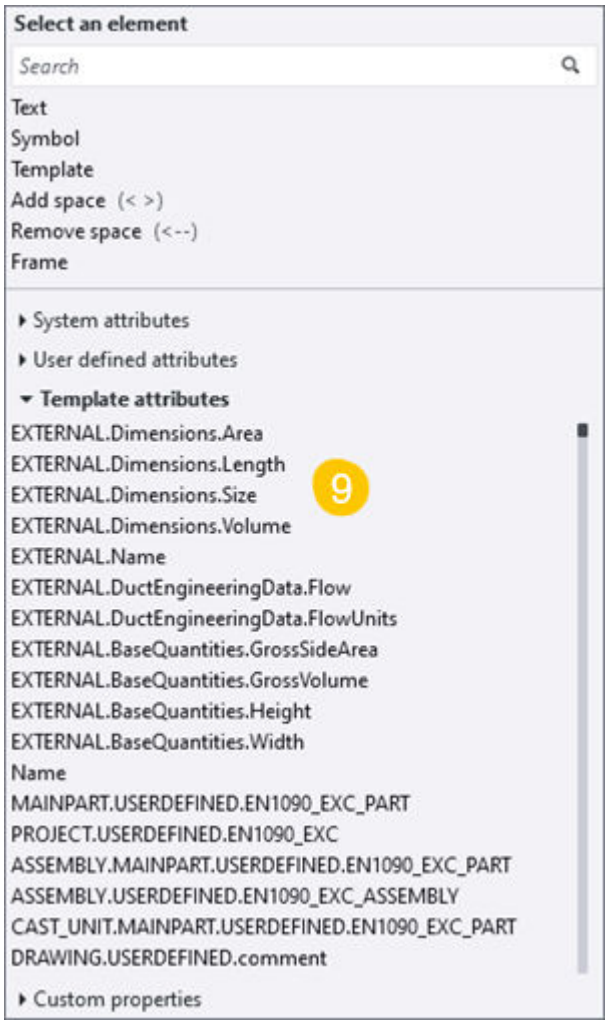
The new drawing property pane in Tekla Structures 2023 introduces a visual editor for editing drawing annotations, such as dimension tags, view labels, associative notes, and most mark types. You can see the resulting annotation as you create it, which makes the editing of the annotations much easier.

How to use the visual editor

The visual editors in the property pane for various annotation objects have the same basic functionality.


Section label
Section name
A
Properties
Values
1
4
Start
End
2
Section name
Name
3
5
100 %
Select an element
6
Text
Symbol
Add space (< >)
Remove space (<--)
Frame
System attributes
Section name
7
In use
Drawing name
Source drawing name when moved
Source drawing name


Tags
8
[Value]
Tag text



(1) Click the **Properties** or **Values** button to show either the property name or the property value in the preview. These buttons are only available when you are modifying an annotation.

(2) The preview of the annotation shows the annotation containers, the elements that you have added in the containers, and the representation that you have defined for the whole annotation or for a single element, such as font styles, frames, or symbols. An annotation container is a box in the editor, where you add the elements. For some mark types, such as detail marks, section marks, and view labels, you can save the contents you have defined for the mark in a property file and load the properties when creating another mark.

(3) Use the **New element** button to open the element list and select the elements to add in your annotation. Use the **New container** button to add new containers in section marks, detail marks, or view labels. You can add up to five containers.

- To add elements in a container, click the container.

- In most of the visual editors, you can drag elements and containers. In the section mark editor, you can only drag elements inside and between containers. The dimension tag editor only allows you to drag elements inside a container.
- To delete an element or a container, click the red delete button ✖ in the upper-right corner of the element or container.

(4) In section marks, to indicate which end of the cutting line you want to work with, click **Start** or **End**.

(5) The **%** button shows the current zoom level in the preview. You can zoom in or out by scrolling the middle mouse button. Click the % button to zoom to the best fit.

(6) Search box for searching elements. The available elements vary according to the object type.

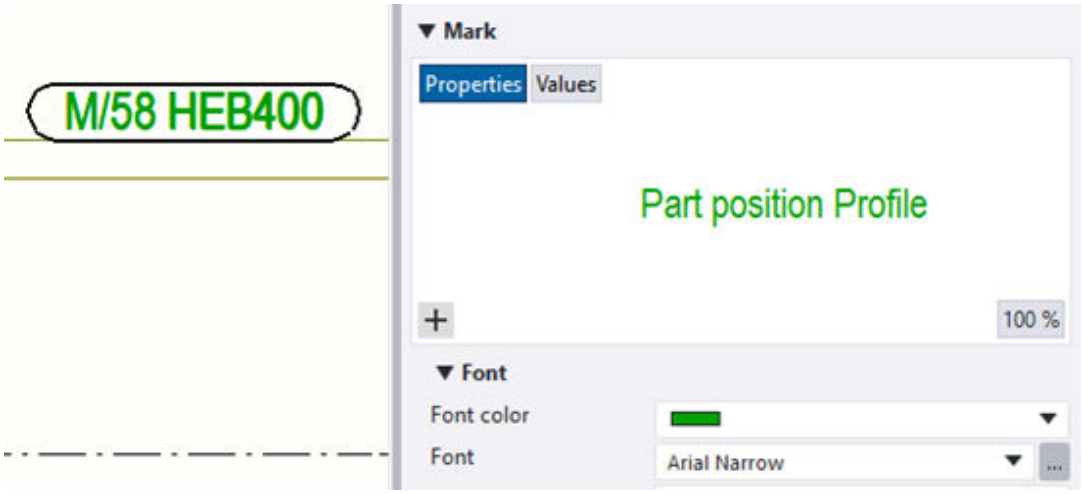
(7) If you have added the element in your annotation already, it is indicated in the element list with **In use**.

(8) In dimension tags, you first need to click a tag container to be able to add elements in the tag in the tag editor. When a dimension tag has some content, the container icon changes to  . You can also type text directly in dimension tag containers, and the text will be shown as you have written it.

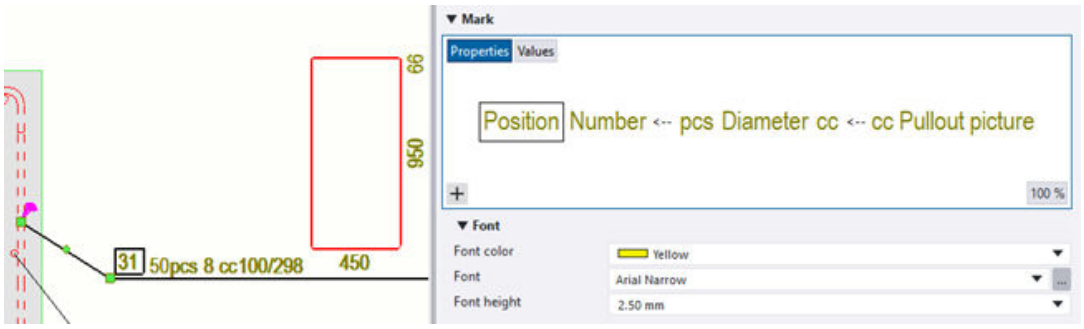
(9) User-defined attributes, template attributes, and custom properties are now listed for selecting, so you no longer have to remember their exact names to type them in.

Examples of visual editors

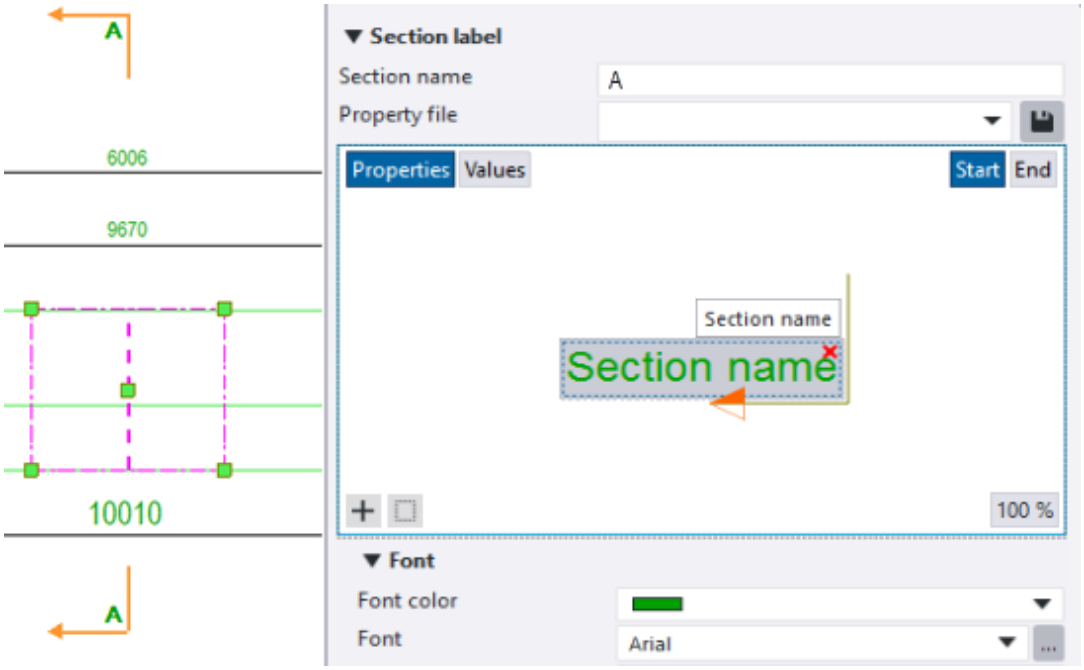
Part mark editor:



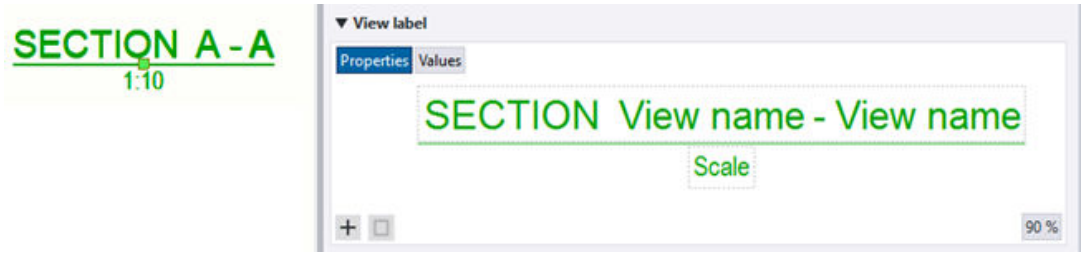
Rebar mark editor:



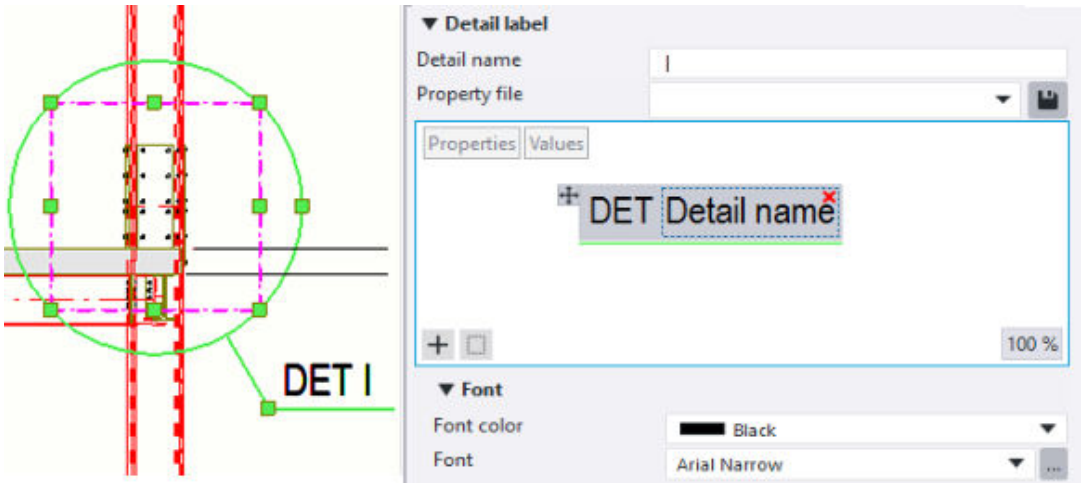
Section mark editor:



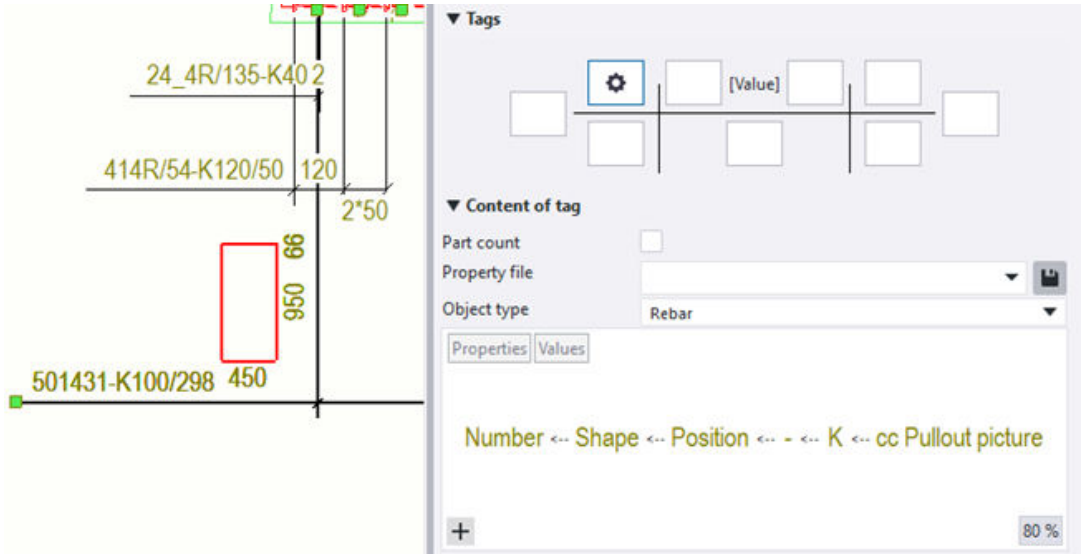
Section view label editor:



Detail mark editor:



Dimension tag editor:



2.2 Improvements in adding marks and associative notes

When you create a mark or an associative note manually, and the content in the properties is not defined for the object type you have selected in the drawing, a mark or a note with a text element set to "Content undefined" is created. You can then select the mark or note and modify the content and properties in the property pane.

Earlier, manually created marks and associative notes were empty and invisible if they did not have content defined in the properties.

2.3 Modify objects in the property pane

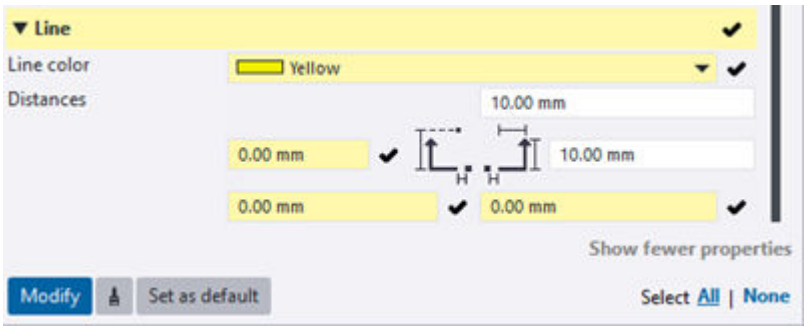
Similarly to the model property pane, you can view and modify the properties of one drawing object type at a time in the drawing property pane, or the common properties of several, similar object types.

1. Double-click a building object, view, associative note, mark, text, dimension, grid, or sketch object.

   The property pane opens, and shows the current properties of the object.

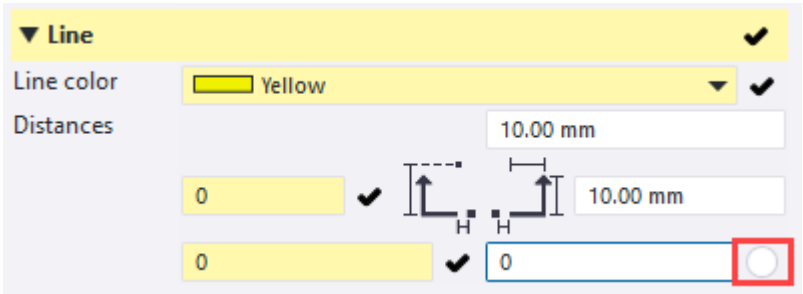
2. Modify the properties as needed.

   Tekla Structures highlights the modified properties in yellow in the property pane.



3. If you want to discard some of the changes, click the check marks next to each setting to remove them.

   You can clear the check marks one by one, or select a whole section and all its properties.

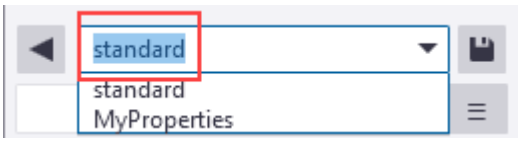


   You can use the **Select All** and **Select None** switches at the bottom of the property pane to select all the changes or to clear all the changes.

4. When you are ready with the modifications, click **Modify** to apply the changes.

   By default, the modified properties become the new current properties. Tekla Structures uses the current properties the next time you create an object of the same type.

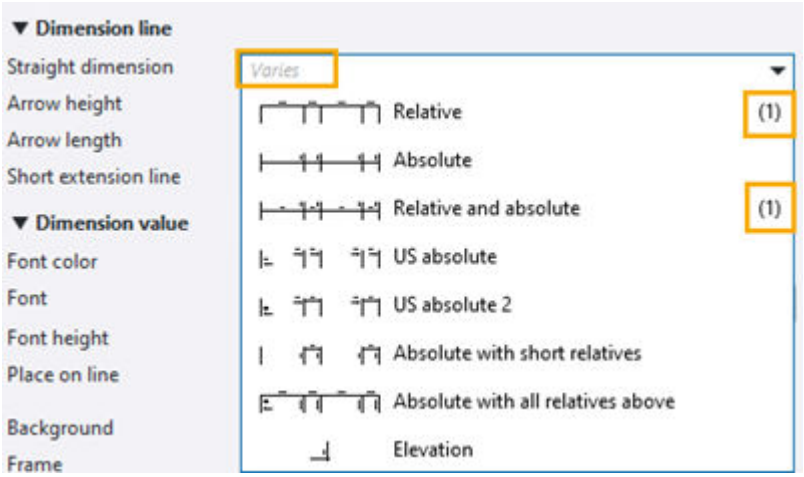
If you want to create an object using the standard values instead of the new current values, load the standard file first.



Note that if you use the contextual toolbar to modify a drawing object, the current properties do not change and are not automatically applied when you create the next object of the same type.

Modify the common properties of similar object types

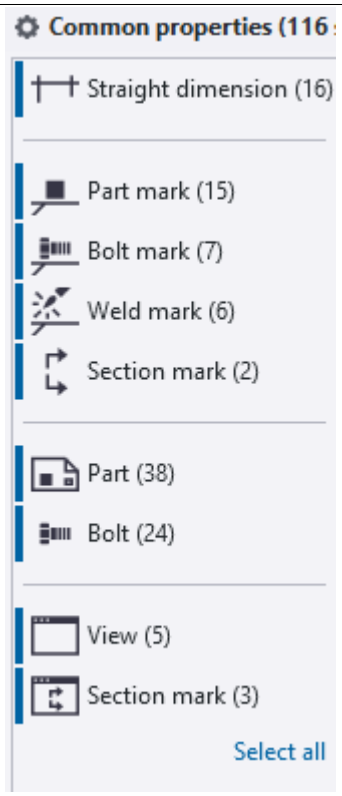
When you select several similar objects in the drawing, the property pane shows the properties that are common for all the selected objects. The properties that different values for different objects have the text *Varies*, and the number of objects with a particular option selected is indicated next to the property. If there are no common properties, the property pane is empty.



You can modify the common properties in the same way as any other property. Tekla Structures highlights the modified properties in yellow in the property pane, and these properties are applied when you click **Modify**.

Use the **Object type list** in the property pane to check which objects you have selected in the drawing and the number of each object type.

To	Do this
Check which objects you have selected in the drawing	Click the **Object type list** button to open the list of the selected objects. 

To	Do this
	 The list shows how many objects you have selected for each object type.
Modify the object selection in the **Object type list**	Hold down **Ctrl** and click the object types in the list that you want to exclude or include in the selection. The content of the property pane may change according to your selection.
Select all the objects in the **Object type list**	Click the **Select all** button.

2.4 Copy object properties from one object to another

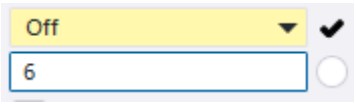
You can use the property pane to easily copy properties between any objects as long as both of the objects have the same property available.

1. In the drawing, select the object from which you want to copy properties.
2. In the property pane, click  **Copy properties**.

3. In the drawing, select the objects to which you want to copy properties. You can use area selection to select the objects.

   Tekla Structures highlights the modified properties in yellow in the property pane.

4. Select or clear the check marks to indicate which properties you want to copy.

   You can clear the check marks one by one, or select a whole section and all its properties.

   Use the **Select All** and **Select None** switches at the bottom of the property pane to select all the changes or to clear all the changes. If you use the **Select None** switch, all check marks will be cleared the next time you start the **Copy properties** command.

5. Click **Modify** to apply the selected changes.

   By default, the modified properties become the new current properties. Tekla Structures uses the current properties the next time you create an object of the same type.

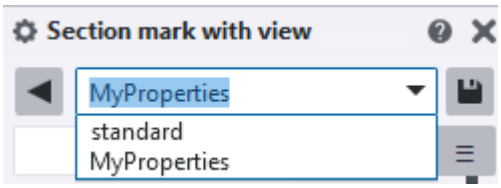
TIP To copy properties to multiple objects, double-click the  **Copy properties** button to keep the **Copy properties** command running. Click **Modify** after each selected object. The mouse pointer remains in the paintbrush mode until you press **Esc** or click  again.

2.5 Save and load property files

You can save sets of properties as property files, and load these properties later when you create new objects.

1. Double-click a building object, view, associative note, mark, text, dimension, grid, or sketch object to view the current properties in the property pane.
2. In the property pane, modify or enter the properties you want to save.
3. In the box next to the  button, enter a name for the new set of properties.
4. Click  to save the properties.

The set of properties is now saved and added to the list of property files in the current model folder:



5. When you want to load the properties, select the set of properties from the list.
   - If you select an object in the model and load a property file in the property pane, the properties are loaded immediately, and the values that are different from the currently selected object are highlighted in yellow in the property pane. Click **Modify** to apply the new values.
   - If you start an object creation command in the drawing and load a property file in the property pane, the properties are used right away and Tekla Structures creates the object using the loaded values.
6. If you want to make changes to an existing set of properties:
   a. Load the set of properties you want to change.
   b. Modify the properties.
   c. Click  .

      Tekla Structures saves the changes in the file shown in the list, overwriting the old set of properties.

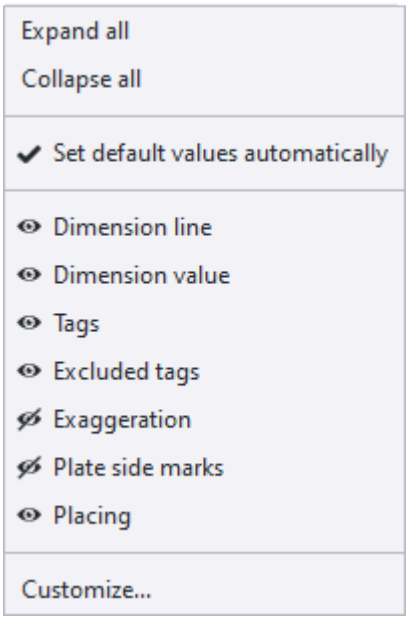
   The modified properties become the new current properties. Tekla Structures uses the current properties the next time you create an object of the same type.

   If you want to create an object using the standard values instead of the new current values, load the standard file first.

2.6 Hide or show a property group

You can hide or show a property group in the property pane.

1. In the property pane, click the  **Property pane settings** button.



2. To hide a property group, click next to a group.

   The eye button changes to hidden: and the property group is now hidden in the property pane.

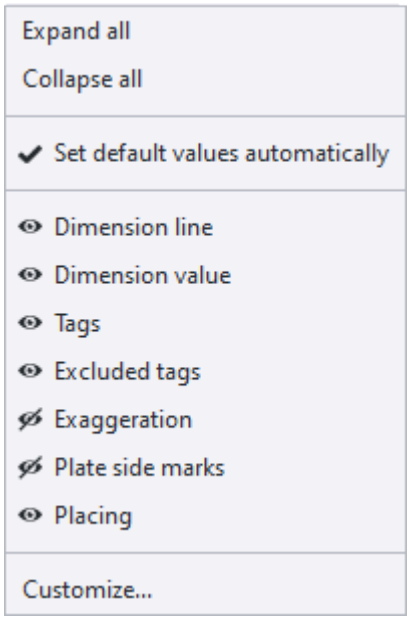
3. To show the property group again in the property pane, click .

   The eye button changes to visible: , and the property group is now visible in the property pane.

2.7 Switch between automatic and manual applying of properties

In the property pane, you can switch between automatic and manual applying of properties. This means that you can select whether only the selected object is modified, or if also the next objects of the same type that you create use the current values.

You can switch between manual and automatic applying of properties at any time in the **Property pane settings** by selecting the **Set default values automatically** option. The option is not dependent on the selected object type.



To	Do this
Enable automatic applying of properties	Click an object in the drawing, click the **Property pane settings** button in the property pane, and ensure that the **Set default values automatically** option **is** selected. This option is selected by default. When the **Set default values automatically** option is selected, Tekla Structures automatically uses the current values for the next objects of the same type. When you modify the property values of the object, and click **Modify**, Tekla Structures modifies the object and creates the next object of the same type using the current values.
Enable manual applying of properties	Click an object in the drawing, click the **Property pane settings** button in the property pane, and ensure that the **Set default values automatically** option **is not** selected. A **Set as default** button appears at the bottom of the property pane.

To	Do this
	When you modify the property values of the object, you can select how to proceed: • To modify the selected object only, click **Modify**. • To modify the selected object and to use the current values for the next objects of the same type, click the **Set as default** button and then click **Modify**. • To use the current values for the next objects of the same type, but not to modify the selected object, click the **Set as default** button.

When you modify the property pane settings in the **Property pane settings** menu, the current settings are saved to the `PropertyPaneDrawingSettings.xml` file. The file is located in the `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UI\PropertyPane\` folder.

If you do not change the settings, the `PropertyPaneDrawingSettings.xml` file is not created.

If the settings in the `PropertyPaneDrawingSettings.xml` file is customized, the company administrators can distribute the customized property pane settings to other users in the company.

2.8 Customize the drawing property pane layout

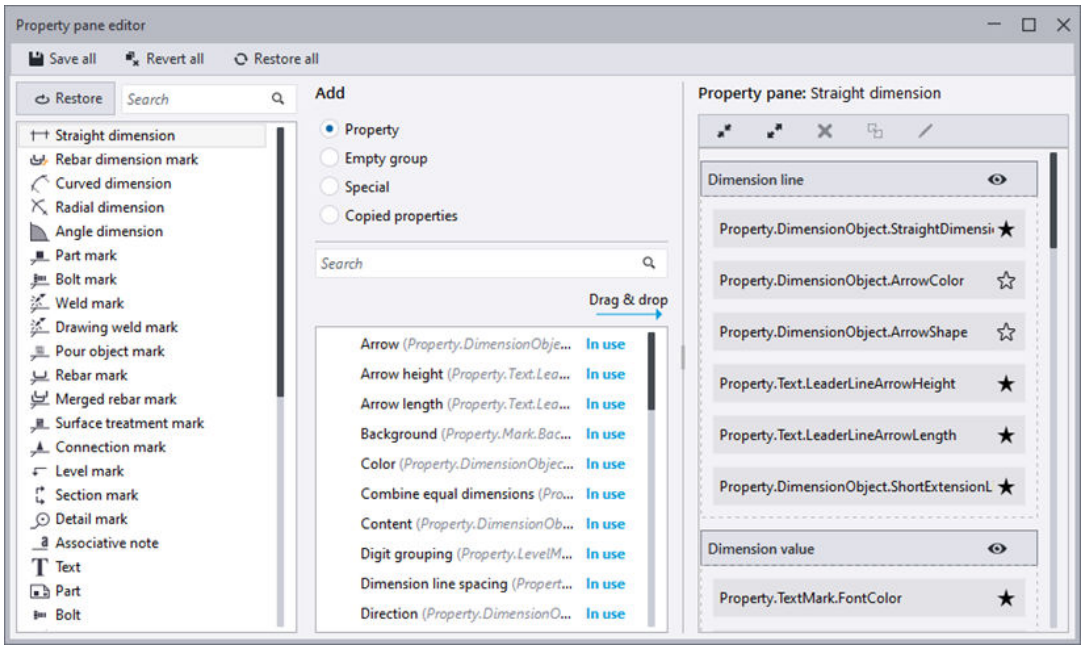
You can customize the drawing property pane in **Property pane editor** to better suit your needs. You can select separately for each object type which properties you wish to see in the property pane. With **Property pane editor** you can show, hide and organize the settings in the property pane.

With the **Property pane editor**, you can

- organize properties to a suitable order or to suitable groups
- remove properties you do not use or need
- create your own groups for properties that you find relevant
- add properties to an existing group
- create nested property groups
- rename properties or groups
- save the customized property pane layouts

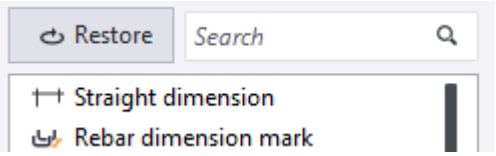
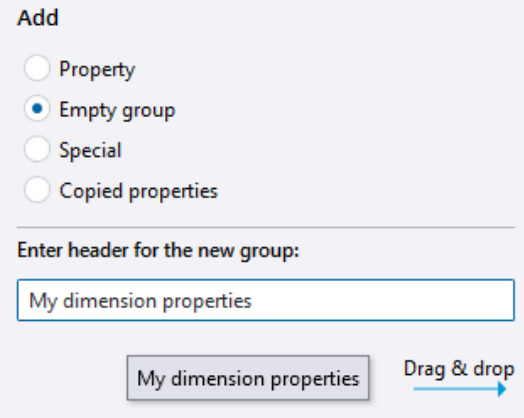
To open the **Property pane editor** , click **File menu** --> **Settings** --> **Customize** --> **Property pane**. The **Customize** command is also available in the property pane in the **Property pane settings** menu.

- In the object list on the left, select the object type whose property pane layout you want to modify. For example, select **Straight dimension**.
- The property list in the middle shows all the available properties for each object type. You can add these properties to the property pane layout as regular properties. The properties that are already in use cannot be added for a second time, but you can reorganize them in the property pane layout.
- The right side of the **Property pane editor** shows the current layout of the property pane for the selected object type.

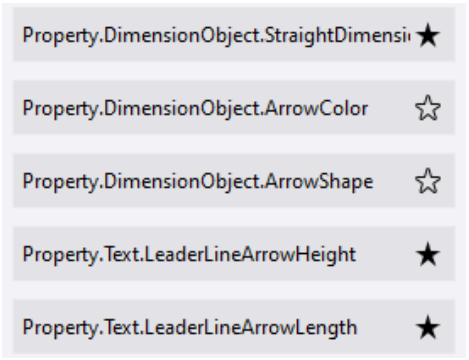


The customized property pane layouts are saved to the `PropertyTemplates.Drawing.xml` file in the `..Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UI\PropertyTemplates\` folder. If you cannot find the folder, ensure that you are able to view the hidden files and folders on your computer.

Company administrators can distribute the customized drawing property pane layouts to the whole organization, in the same way as customized property pane in modeling mode, customized ribbon, or customized tabs.

To	Do this
Select the object type whose property pane layout you want to modify	In the object type list on the left, browse through the list or use the **Search** box to filter content. 
Add a new property to the property pane layout	Select a property from the list in the middle and drag it to the property pane layout on the right. You can drag the property to any group on the property pane.
Add a new group to the property pane layout	In the middle column's **Add** section, select **Empty group**, enter a title for the new group, and drag the group template to the property pane layout on the right.  You can create a new group, or insert a new group inside an existing group to create nested groups. You can reorganize the existing groups by dragging them.
Rename a group or a property	Click  and enter a new name for the group or for the property. Press **Enter** to activate the name. Alternatively, right-click the group or the property name and select **Rename**.
Copy a group from one object type to another object type	You can copy groups from one object type to another object type, for

To	Do this
	example, from one sketch object to another. 1. From the object type list on the left, select the object type from which you want to copy properties. 2. In the property pane layout on the right, select the properties you want to copy. Use the **Ctrl** or **Shift** key to select multiple properties. 3. Click  to copy the selected properties. 4. From the object type list on the left, select the object type to which you want to copy the properties. 5. In the **Add** section, ensure that the **Copied properties** option is selected. 6. Drag the **Copied properties** box from the middle column to the property pane layout on the right. If you copy nested groups, all the nested groups inside the main group are copied, too. If you copy properties that are already in use, the copied properties have the text **In use** in the **Content** section. Properties that cannot be added to the selected object type have the text **Incompatible** in the **Content** section.
Discard changes	Click the **Revert all** button to discard changes and to revert to the previous save.
Delete a group or a property	Right-click a group or a property, and select **Delete**.

To	Do this
Remove a single customization	Click the **Restore** button to remove the customization of a selected object type's property pane. Alternatively, right-click the selected object type and select **Restore to default**.
Remove all customizations	Click the **Restore all** button to remove the customization of all property pane layouts.
Set the default visibility for a single property	By default, some object types have a large number of properties visible in the property pane, and it can be cumbersome to find the needed property among all the properties. To make the property pane less cluttered, you can mark properties as frequently or infrequently used and thus hide the infrequently needed properties. 1. In the property pane layout on the right, select the property you want to mark as frequently or infrequently used. Use the star to mark it frequently used.  • Select the star to mark the property frequently used. • Clear the star selection to mark the property infrequently used. The property will be hidden in the property pane. 2. To mark several properties as frequently or infrequently used at

To	Do this
	one go, use the **Ctrl** or **Shift** key to select multiple properties. This is a new feature in the property pane, and more thoroughly explained in Property pane improvements (page 30) and in Customize the property pane layout.
Set the default visibility for a property group	You can define whether selected property groups are by default visible or hidden in the property pane. 1. In the property pane layout on the right, select the property groups you want to hide. 2. Right-click and select **Hide by default**. The eye button changes to hidden:  . The selected property groups are now by default hidden in the property pane. 3. To have the property groups by default visible again in the property pane, right-click and select **Show by default**. The eye button changes to visible:  . The selected property groups are now by default visible in the property pane.
Save the changes	Click the **Save all** button. When you return to Tekla Structures, Tekla Structures asks if you wish to reload the changed property pane templates. Click **Yes** to take the customized property pane layout in use.

3 Show only frequently used properties in the property pane

You can now control separately for each object type which properties are shown in the property pane.

Thus, you can create your favorite sets of properties for every object type, and make the property pane less cluttered by hiding the properties that are not needed frequently.

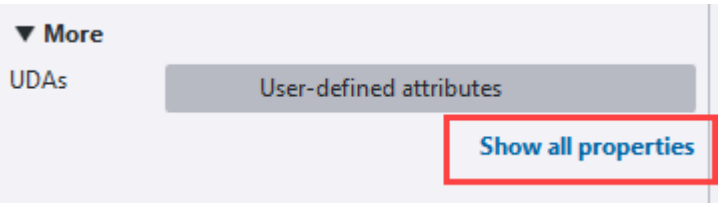
Customize the property pane layout using the **Property pane editor**, and mark each property as frequently or infrequently used. When using the property pane, you can select between showing only the frequently used properties or all the properties of one object type.

After you have marked the properties as frequently or infrequently used in the **Property pane editor**, the **Show fewer properties** or the **Show all properties** button is activated at the bottom of the property pane. Use the buttons to switch between showing the frequently or the infrequently used properties.

1. To show only frequently used properties in the property pane, customize the property pane layout of the selected object type.
2. In the model or in the drawing, double-click an object to open the property pane.

   Only the properties that are marked as frequently used are shown. Other properties are hidden.

   If all the properties are marked as frequently used, the **Show fewer properties** button is not available.
3. If you want to see all properties, click the **Show all properties** button.



4. If you want to switch back to only frequently used properties, click the **Show fewer properties** button.

NOTE If you close Tekla Structures or switch between modeling mode and drawing mode, Tekla Structures shows the frequently used properties in the property pane.

You have to click the **Show all properties** button to show all the properties.

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4 Printing improvements

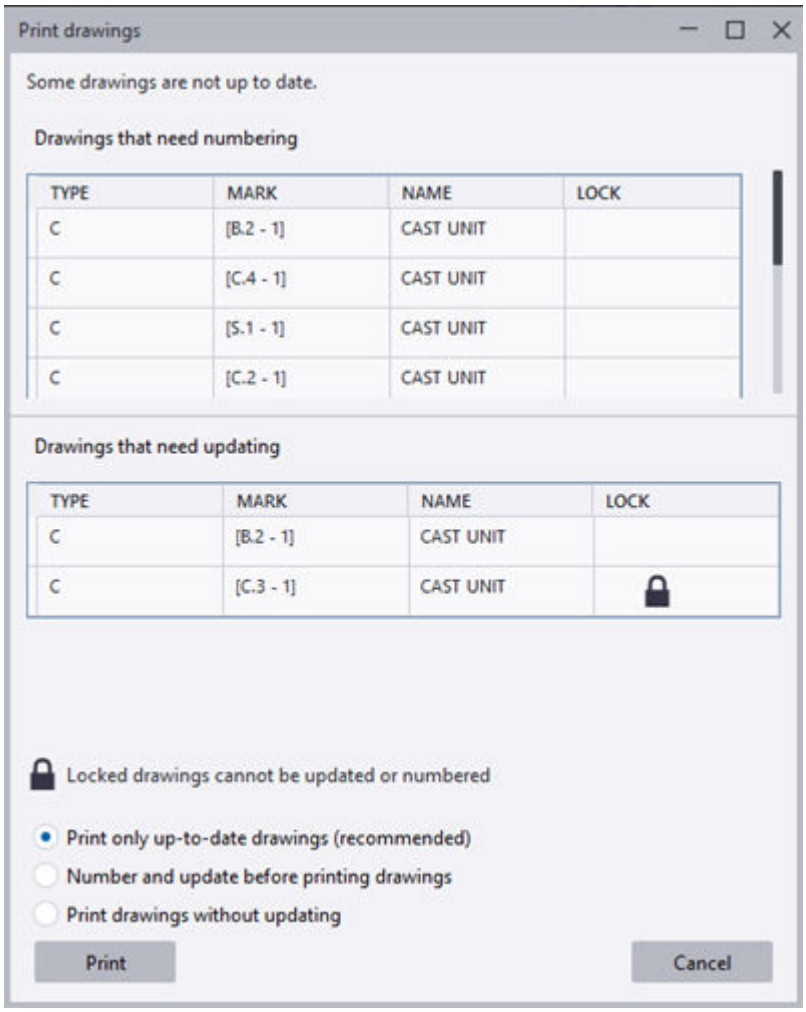
Tekla Structures 2023 introduces important improvements allowing you more control over printing.

4.1 Better workflow for batch printing drawings

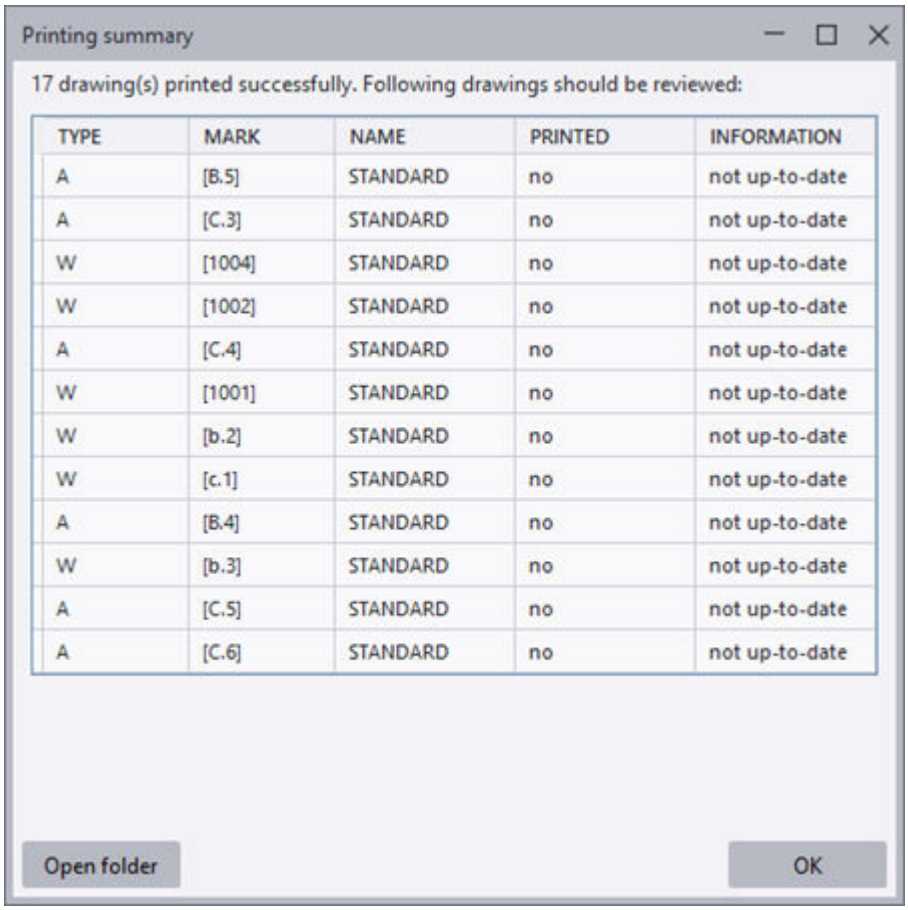
The process of printing a large number of drawings at one go is now more reliable, and you have more control over the printing. If the list of drawings to be printed contains drawings that require numbering or updating, this is now indicated in a separate dialog box that is displayed before you can start printing. This allows you to print all drawings at one go, because you have already selected what to do with drawings that might cause interruptions, and you can even print overnight if you like.

To print drawings, select the desired drawings in **Document manager** and click  **Print**. If you have selected drawings that need to be numbered or updated, the new dialog box is displayed. Select one of the options:

- **Print only up-to-date drawings (recommended)** - This is the default option.
- **Number and update before printing drawings**
- **Print drawings without updating**
- Cancel the whole process



When you click **Print**, a summary is displayed showing you the printing result and the drawings that need attention.



NOTE You cannot update or number locked drawings.

4.2 Printing multibyte characters

When printing to PDF, if a correct font containing the needed multibyte characters is selected for Unicode characters, for example, in marks, the font is now shown correctly even if you do not embed the fonts. If the selected font does not contain all characters in the text, the font defined for the new advanced option XS_DEFAULT_UNICODE_FONT_DRAWING_PRINTING is used. The default value is Arial Unicode MS. This font might not be installed on your machine by default, and you may need to install it. You can also define another font that contains the characters you need and that you have installed on your machine.

Before:

After:

4.3 Other printing improvements

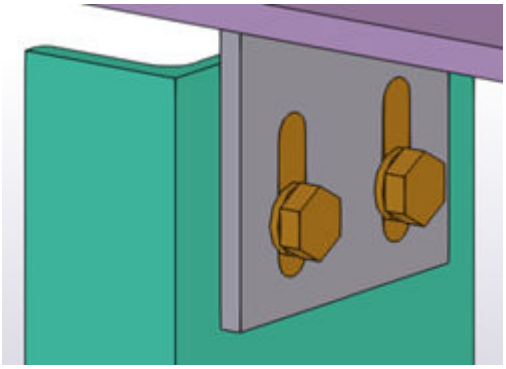
- Previously, Tekla Structures always printed on the default tray. Now you can change the tray from the printer properties and the tray selection is saved. Using a bypass tray is also supported.
- Printing watermarks using the PDF-Xchange printer works again. For more information on printing watermarks, see How to add a watermark in drawings.
- If a drawing file name had an illegal character, the file could not be printed. In this particular case, the problem was caused by the new line character "\n" included in the applied advanced option. Now the list of characters that Tekla Structures replaces with an underscore has been expanded. The new line character is now replaced by "_", and creating the PDF now succeeds. Check the file naming conventions provided by Microsoft "Naming Files, Paths, and Namespaces" (http://msdn.microsoft.com/en-us/library/aa365247.aspx).
- Printing of reports using bold font is again possible.
- Snapshots from Tekla Structures 2017 onwards now work. Earlier, there was no conversion for older snapshots, and newer Tekla Structures versions prevented the old snapshots from opening.
- Now the positioning in snapshots, previews, and printing is working correctly.

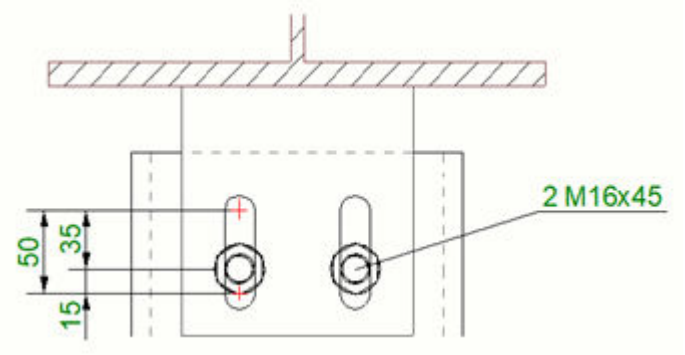
5 Slotted holes with offsets, tapped holes, and other bolt hole improvements

Tekla Structures 2023 comes with bolt hole improvements that have been requested by many steel detailers and fabricators. For example, you can now offset bolts in slotted holes to comply with construction tolerances and installation requirements.

5.1 Slotted holes with offsets

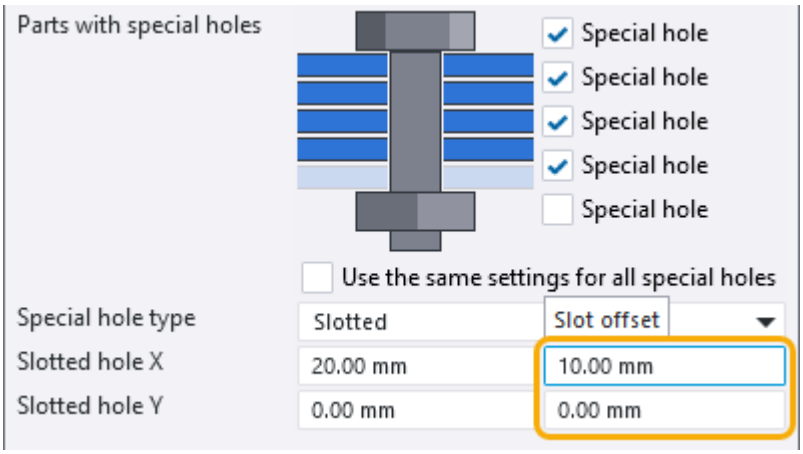
You can now create slotted holes where the bolt is not in the middle of the hole. This kind of holes allow movement in connections that are subject to thermal expansions, seismic loads, or vibrations, for example. The allowances and offsets of slotted holes can be defined separately for both hole or bolt group directions.





In Tekla Structures 2023, you no longer need to create bolts and each set of different offset slotted holes separately, as previously.

In the **Bolt** property pane in modeling mode, next to **Slotted hole X** and **Slotted hole Y**, there is now a new **Slot offset** box for the x direction and the y direction of the bolt group.



Note that entering a value for **Slot offset** moves the slotted hole, not the bolt.

With these new settings in the **Bolt** property pane, the previous **Rotate Slots** setting is no longer needed and it has been removed.

Slotted holes with offsets can also be defined in custom components. In system components, you cannot offset slotted holes from bolts. Information about slotted holes with offsets can be shown in drawings and reports, and can be exported into IFC and NC files.

In assembly and single part drawings, slotted holes with or without offsets are dimensioned to their center, and a cross indicates the center of each slotted hole. However, in general arrangement drawings, a cross indicates the position of the bolt. In side views in drawings, an axis is shown for both the bolt (only if the bolt is present) and the slotted hole.

5.2 Tapped holes

Tapped holes have threads drilled in them. Tapped holes are used, for example, in cases where there is no access to the other side of a connection, or no space to fit a nut at the end of a bolt, or in a handrail post that is to be mounted to an embedded steel plate in a concrete wall.

A new **Special hole type** option, **Tapped**, and the **Core hole size** box have been added to the **Bolt** properties. In **Core hole size**, you can define the predrilling hole size for a tapped hole.

Tapped holes can also be created using system and custom components.

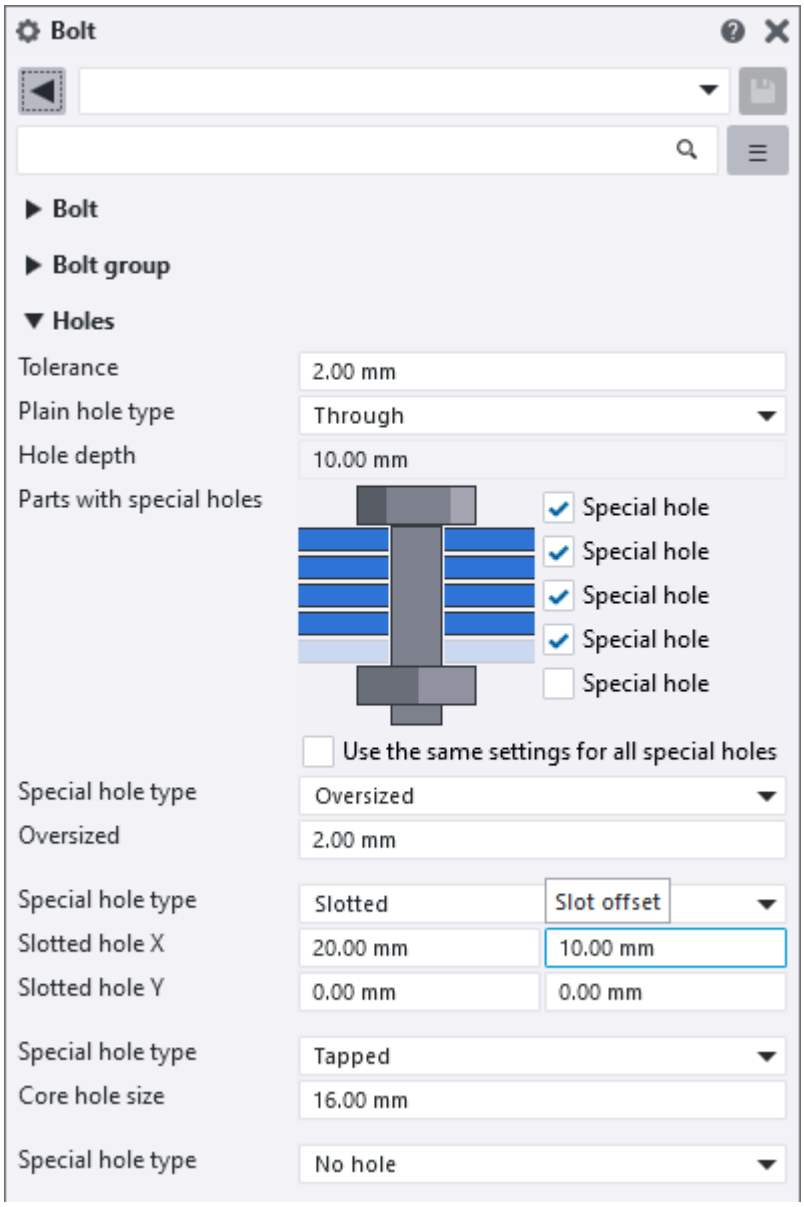
Information about the threads can now be exported into IFC and NC files. You no longer need to manually postprocess NC files to add thread information.

In drawings, tapped holes and thread information can be shown with a special mark and a specific symbol. For example:

If you create blind holes that are tapped, details about drilling the hole end are not included.

5.3 Various special holes with one bolt group

When several parts are connected together with a bolt group or single bolt, it is now possible to create different holes in each of the parts. The holes in one part can be slotted, and the holes in the other parts can be either special or standard holes.



If you clear the new **Use the same settings for all special holes** check box in the **Bolt** properties, you can define different special bolt holes for up to five parts with one bolt group. The rest of the connected parts (the sixth and so on) will get regular round holes.

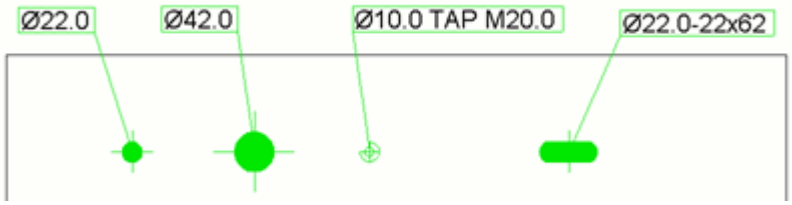
If you select the **Use the same settings for all special holes** check box, the properties of the special hole that is closest to the bolt head will be used for all special holes in the bolt group.

This new feature is also available in custom components, but not in system components.

Information about the various special holes in a bolt group can be shown using the **Inquire object** command, or the template attributes listed further below.

The **No hole** option visualizes the bolt axis, but no BO blocks are created in the DSTV files as previously.

In drawings, different bolt holes can be shown with different symbols and marks. This example shows a regular round hole, an oversized hole, a tapped hole, and a slotted hole:



You can also filter bolts based on their hole types.

5.4 New advanced options for special hole marks

Use the following new advanced options to define the contents of the **Size** element in marks for tapped and oversized bolt holes. Separate advanced options are available for workshop and site holes, and for fabrication drawings and general arrangement drawings.

- XS_SHOP_TAPPEDHOLE_MARK_STRING_FOR_SIZE
- XS_SHOP_TAPPEDHOLE_MARK_STRING_FOR_SIZE_IN_GA
- XS_SITE_TAPPEDHOLE_MARK_STRING_FOR_SIZE
- XS_SITE_TAPPEDHOLE_MARK_STRING_FOR_SIZE_IN_GA
- XS_SHOP_OVERSIZEDHOLE_MARK_STRING_FOR_SIZE
- XS_SHOP_OVERSIZEDHOLE_MARK_STRING_FOR_SIZE_IN_GA
- XS_SITE_OVERSIZEDHOLE_MARK_STRING_FOR_SIZE
- XS_SITE_OVERSIZEDHOLE_MARK_STRING_FOR_SIZE_IN_GA

5.5 New template attributes

The following new template attributes are now available for bolt holes:

- HOLE_TYPE
- HOLE_1_TYPE ... HOLE_5_TYPE
- PLAIN_HOLE_TYPE

- SPECIAL_HOLE_1_X ... SPECIAL_HOLE_5_X, SPECIAL_HOLE_1_Y ... SPECIAL_HOLE_5_Y

  (also used with **Inquire object**)

You can use these attributes in filtering, in reports, and to customize marks in drawings, for example.

6 Modeling improvements

Tekla Structures 2023 comes with the following enhancements related to modeling:

6.1 Clearer status bar messages

Status bar messages, which are located at the bottom of the Tekla Structures main window, have now been updated and improved in modeling mode. Also, some new status bar messages have been added to support the command workflow.

Now the status bar messages give clearer descriptions and instructions how to proceed when a command is started. With the short instructional messages, the status bar messages give you instant information and feedback if the command is successful, or how to proceed if you are cannot work with the command as expected.

6.2 Performance improvements in numbering

The numbering process of identical, copied parts is considerably faster in Tekla Structures 2023 than earlier.

6.3 Clash check manager - easier selection of clash check content

It is now easier to control what is included in clash checking by using the **Between parts**, **Between reference models**, and **Objects in reference models** settings in the **Clash check manager** dialog box. You can easily

change the clash check content according your needs by selecting the appropriate settings.

Previously, the settings were also controlled by the values defined for the related advanced options. These advanced options have now been removed: `XS_CLASH_CHECK_BETWEEN_REFERENCES`, `XS_CLASH_CHECK_INSIDE_REFERENCE_MODELS`, and `XS_CLASH_CHECK_BETWEEN_PARTS`.

Now, when you open **Clash check manager** for the first time after starting Tekla Structures, or after you have opened a new model, the **Between parts** setting is by default selected, and the **Between reference models** and **Objects in reference models** settings are not selected.

6.4 Previously selected properties are used when copying properties in the Property pane

Now, when you start copying properties in the property pane, Tekla Structures selects the same properties as when you previously copied properties of an object of the same type. Earlier, all the properties were always selected when copying was started.

If you clear all the selections, all check marks will be selected the next time you start the **Copy properties** command.

6.5 The Dashed line for hidden line option does not require restart anymore

The **Dashed line for hidden line** option in **File** --> **Settings** --> **Switches** does not require restarting of Tekla Structures anymore. Now you only need to reopen the view to activate the new value.

Additionally, the advanced options `XS_USE_DASHED_HIDDEN_LINES` and `XS_HATCH_OVERLAPPING_FACES_IN_DX` that were used until Tekla Structures version 2021 when the options were added to the **File** menu, have now been removed from the **Advanced options** dialog box.

6.6 Work plane handler toolbar - the last used coordinate system is restored in model opening

If you have added base points or saved work planes to the **Work plane handler** toolbar and close the model, the last used work plane or base point is now used when the model is reopened.

6.7 CustomComponentDialogFiles are selected by default when using the Saving as Model Template command

Now, when you save a model using the **Save as model template** command, the check box for `CustomComponentDialogFiles` in the **Include model subfolders** list is selected by default.

6.8 Support tool - prevent the selection of all files

You can now prevent the support tool from preselecting all files for sending in your support request with the new advanced option XS_SUPPORT_TOOL_EXCLUDE_ALL_FILES. Previously, all files were selected by default, which could cause problems with large models. This advanced option must be set in the `user.ini` or `teklastructures.ini` file. Note that this advanced option does not work if you define it in the `options.ini` file.

7 Reinforcement improvements

Tekla Structures 2023 introduces improvements in rebar shape recognition, in **Rebar shape manager**, and related to rebar sets.

Some reinforcement improvements were already introduced in Tekla Structures 2022 service packs.

7.1 Improvements in rebar shape recognition and Rebar shape manager

Tekla Structures 2023 comes with changes in rebar shape recognition. It is now possible to recognize bar bending shapes and assign appropriate shape codes to bars in concrete structures that have complex geometry. The previously recognized polylines and even polycurves might produce complicated bending shapes for bars that followed a curved face of a part, for example. Now in Tekla Structures 2023, all bars are recognized as polycurve geometry that can contain straight and curved legs. Arcs are recognized as arcs also when combined with straight legs.

Tekla Structures 2023 is also able to simplify complex bar shapes according to the shape recognition settings, so that a recognized bar shape would match one of the predefined bending shapes, if possible.

In **Rebar shape manager**, under the preview of a selected model bar or bending shape, Tekla Structures shows a description of the recognized bar geometry, and the number of bendings and arcs. If you move the mouse pointer over the text, a tooltip shows which tolerance values and other properties are in use for the selected bar. If the bar geometry has been simplified in the recognition process, **(Simplified)** is shown next to the description text, and the tooltip shows the simplification result.

The new polycurve bar geometry is not used in exports.

New advanced options in rebar shape recognition

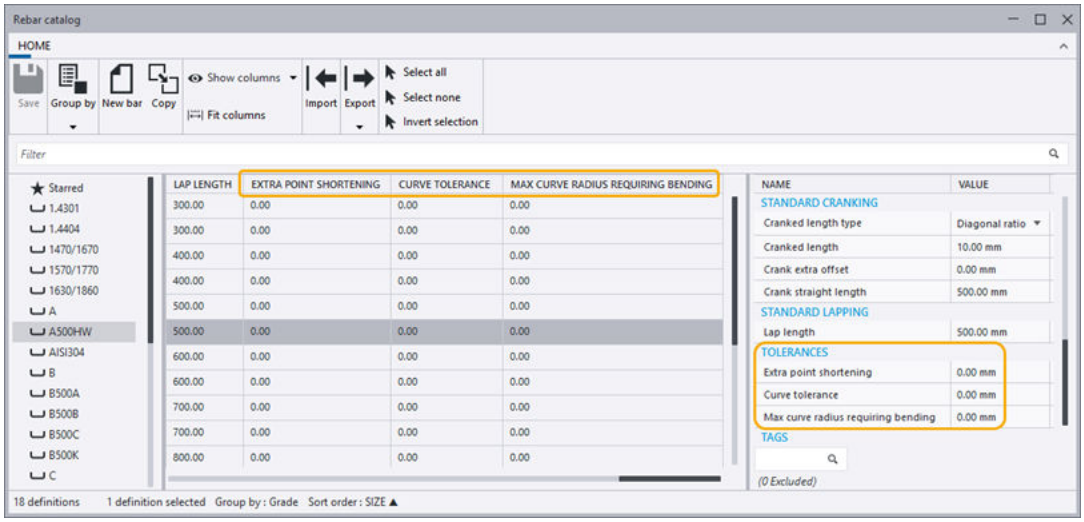
The following new advanced options define the default values for the tolerance settings that are used in rebar shape recognition:

- XS_REBAR_RECOGNITION_CURVE_TOLERANCE sets the default value for **Curve tolerance**
- XS_REBAR_RECOGNITION_EXTRA_POINT_SHORTENING sets the default value for **Extra point shortening**
- XS_REBAR_RECOGNITION_MAXCURVE sets the default value for **Max curve radius requiring bending**

If needed, these default values can be overridden by modifying rebar definitions in the rebar catalog (`rebar_database.inp`) or by using the **Shape recognition** user-defined attributes of individual reinforcement objects.

Recognition settings in the rebar catalog and user-defined attributes

Extra point shortening and **Curve tolerance** have been moved from the **Rebar shape manager** dialog box (**Tolerances** tab) to the rebar catalog. They are also available in the **Shape recognition** user-defined attributes for reinforcement objects.



Max curve radius requiring bending is a new tolerance setting in the rebar catalog and in the **Shape recognition** UDAs, and **MAXCURVE** is a new parameter in the bending shape rules in **Rebar shape manager**. You can use these settings to define if a curved segment of a bar (or a curved bar) needs to be bent before the supply to the site. If the arc's inner radius exceeds the bar's **Max curve radius requiring bending** value, the curved segment is recognized as a straight leg (or the bar is supplied straight).

A new user-defined attribute, **Recognize as straight bar** (`RSR_FORCE_STRAIGHT`), is also available for reinforcement objects. You can use it to have Tekla Structures recognize individual reinforcement objects as straight bars even though they are bent in the model.

Removed settings

- The previous **Extra point max angle** setting has been removed from the **Rebar shape manager** dialog box (**Tolerances** tab).

- The advanced options `XS_REBAR_COMBINE_BENDINGS_IN_EVALUATOR` and `XS_REBAR_USE_POLYCURVES_IN_EVALUATOR` have been removed.

Other improvements in Rebar shape manager

- In **Rebar shape manager**, the template attributes `USAGE` and `USAGE_VALUE` can now be used as custom properties in bending shape rules.

7.2 Changes in attachment of rebar set bars

- Improvements in automatic attachment of rebar set bars to concrete parts were introduced in Tekla Structures 2022 SP2 and SP4.
- The commands **Attach to part** and **Detach from part** were added to the property modifier context menu in Tekla Structures 2022 SP1. You can use the commands to manually attach rebar set bars that intersect the property modifier to a concrete part.
- Using the **Attach to part** command with rebar sets now works better than it did in previous versions. Previously, only the currently existing rebar set bars were attached to the part. If more bars were subsequently added to the rebar set, the command had to be used again in order to attach the added bars. Now in Tekla Structures 2023, bars added to the rebar set are automatically attached, without having to run the command again.

7.3 Other updates in rebar sets

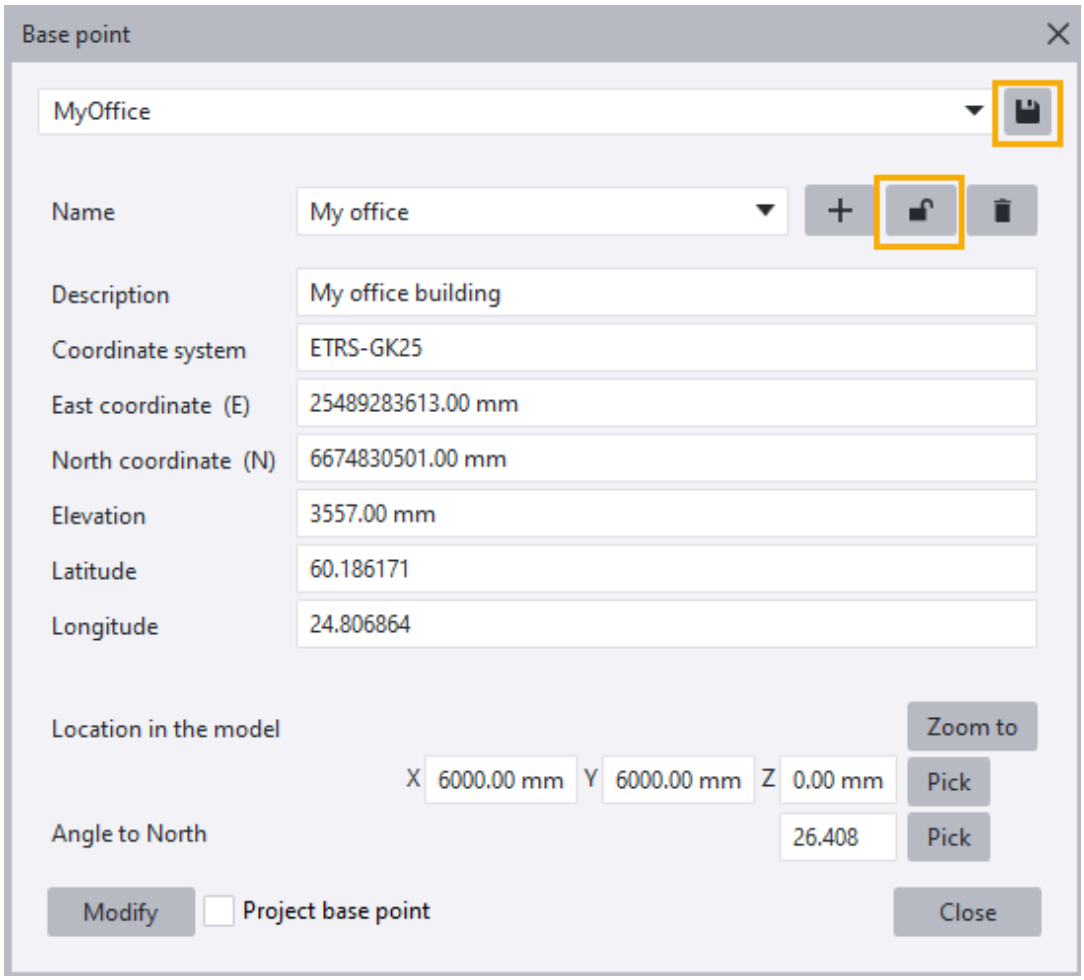
- The short or long leg logic was added for rebar set bars that have couplers or end anchors.

  This improvement was introduced in Tekla Structures 2022 SP6.
- You can no longer use the **By guidelines** command with pour objects or add leg surfaces to existing rebar sets in pour views.

  This change was introduced in Tekla Structures 2022 SP7.

8 Base point improvements

To save time and minimize potential errors for those who are collaborating using a civil coordinate system for project coordination, new base point controls are now introduced. Now you can use the same base point settings in several models and lock base points to avoid unwanted changes. In addition, you can no longer save a base point without giving it a name.



Save and load base point settings

Now you can save and load base point settings. This way you can use the same base point settings in several models. To do this, save your settings in the **Base point** dialog box by giving the settings a new name and clicking the  **Save** button, and copy the settings file `<settings name>.basePoint.json` from the `\attributes` folder under the current model folder to the `\attributes` folder under the model where you wish to use the same base point settings.

The settings also work with project and firm folders: Copy the base point settings file to the `\attributes` folder under the firm and project folders.

This improvement was already introduced in Tekla Structures 2022 SP4.

Lock base points

You can now lock the base point to avoid unwanted changes by others working in the same model. To do this, click the  **Lock/Unlock** button next to the base point name. The button changes to  . To unlock the base point, click the button again.

Base point name required

You can no longer save a new base point in the **Base point** dialog box without giving it a name. This way the base point information is more clear for all users. Previously, there could be multiple base points without a name in the model, which caused confusion.

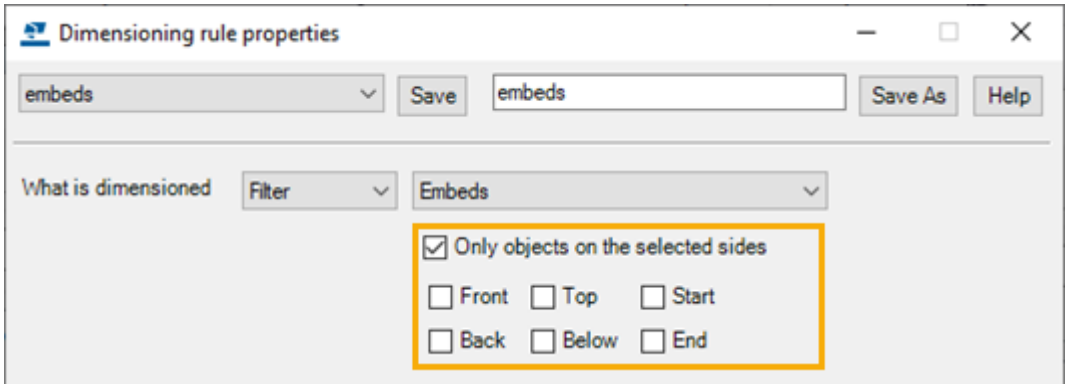
9 Drawing improvements

Tekla Structures 2023 introduces a multitude of improvements to multiple drawing features and functions. From faster drawing opening to improved key plans and marks in multilingual projects, to being able to more easily relabel section and detail views, replace tables in drawings, and save layouts. Additionally, colors are now indicated with names in the drawing property pane, pull-out pictures have been simplified and improved, columns in the **Drawing content manager** have cumulative sorting, and dimensioning has been improved with more reliable dimension tags, improved filter dimensioning, and a new dimensioning type for neighbor parts.

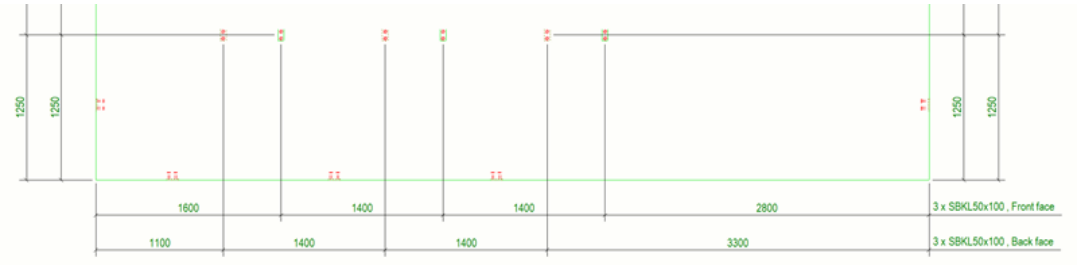
9.1 Dimensioning improvements

Dimension objects on selected sides only

In the view-specific dimensioning, the dimensioning method **Filter** has a new **Only objects on the selected sides** check box in rule creation allowing you to only dimension objects that are on a certain side of the main part, for example, **Front** side. By creating separate rules for each side you can have front and back side objects dimensioned on separate dimension lines.



In the following example, front and back side objects are dimensioned on separate dimension lines:



This improvement was already introduced in Tekla Structures 2022 SP2.

Better performance in Filter dimensioning method

Drawing dimensioning method **Filter** performance has been improved in large models.

NOTE This improvement changes the earlier guidance we gave when releasing Tekla Structures version 2021, that using a selection filter (`.SObjGrp`) would be faster than using a view filter (`.vf`). Now the view filter is faster, and we recommend using only view filters and no longer selection filters.

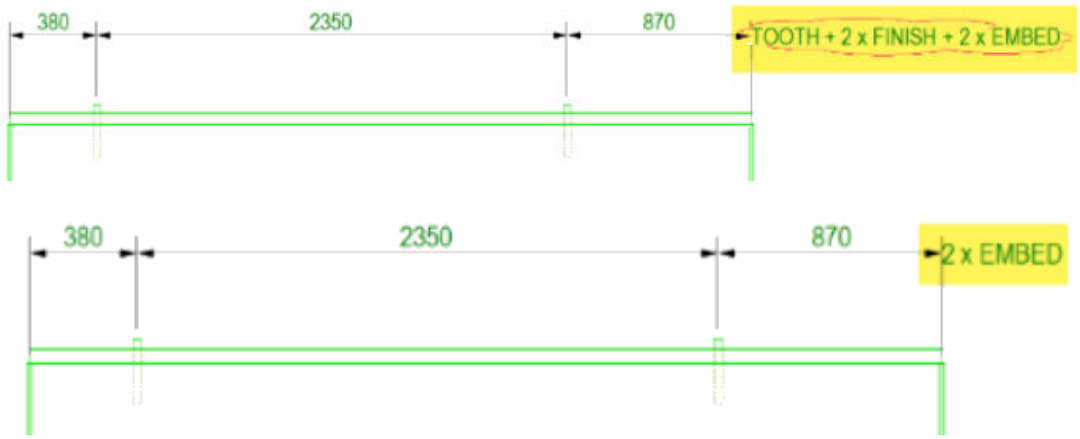
Filter method to dimension only objects visible in views

The **Filter** dimensioning method has been improved so that it does not dimension objects that are not visible in the drawing view. Previously, reinforcements were dimensioned although their visibility setting was **Not visible**.

Dimension tags in cast unit drawings updated correctly

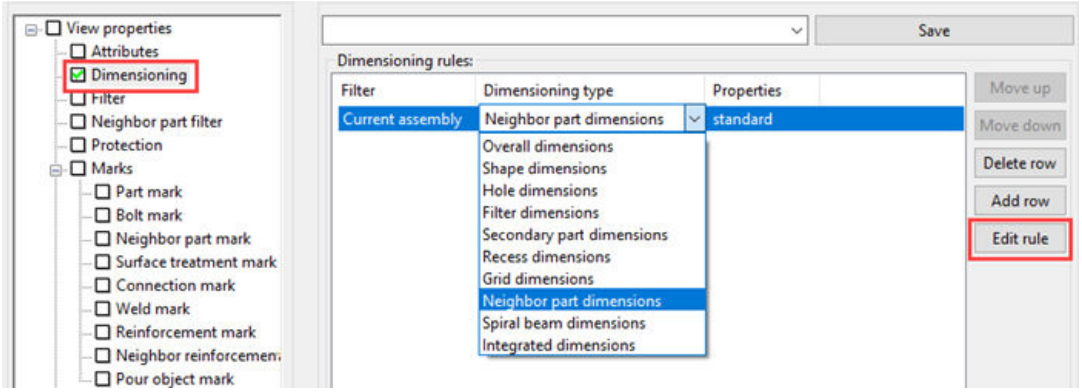
Automatic dimensions and dimension tags are now updated correctly in cast unit drawings. Earlier, when you modified automatically added dimensions manually, or modified the model and reopened the drawing, extra dimension points or tags were sometimes added in the drawing, or dimension tags were updated otherwise incorrectly.

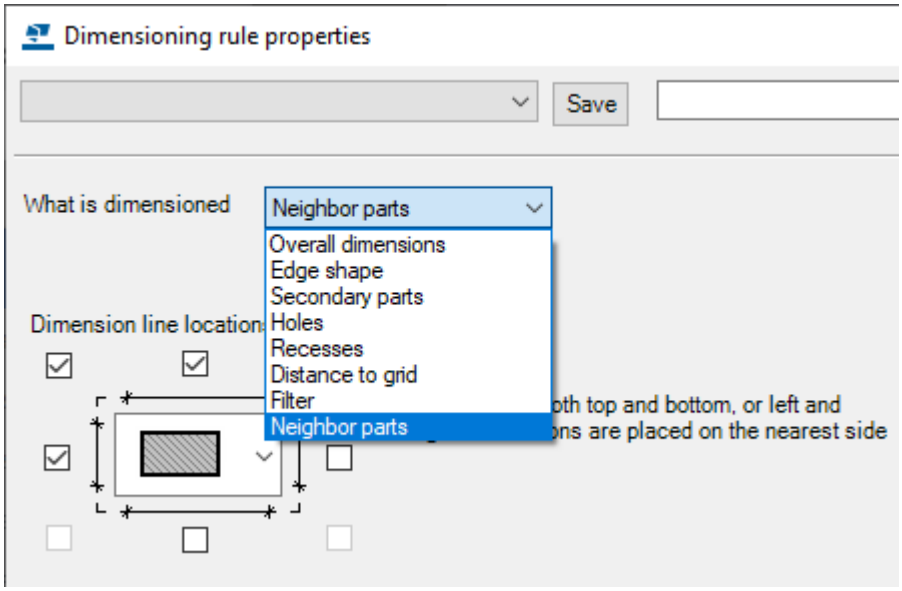
Before:



New dimensioning type for neighbor parts

Now the neighbor parts have their own dimensioning type, **Neighbor part dimensions**. The new type is visible both in the drawing view properties and in the **Dimensioning rule properties**. The rule settings and the dimensioning functionality are the same as in the **Secondary part dimensions**. Note that this feature works best if the view size is extended so that neighbor parts are fully visible in the view.





Dimensions in rebar assembly drawings

The overall, filter, and grid dimensions are now working when the drawing only contains a rebar assembly.

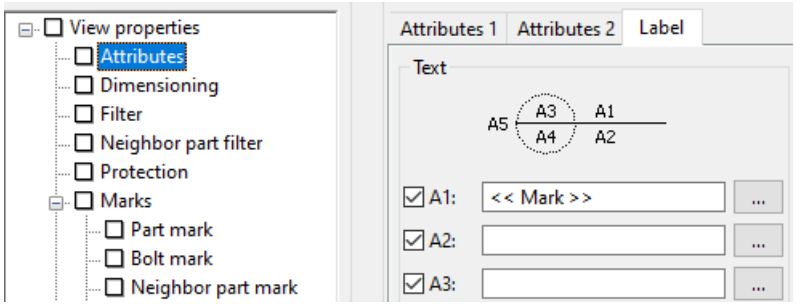
Rebar group dimensioning

The performance of the **Rebar group dimensioning** tool has been improved.

9.2 Drawing mark content text loaded correctly in all languages

Previously, drawing mark setting files containing mark content text (<< Mark >>) did not load correctly when using a different user interface language. Now marks saved in one language can also be loaded in any other user interface language. This improvement applies to all part marks, view label marks, dimension marks and tags, and rebar dimension marks. Now the collaboration is easier in projects where team members use the Tekla Structures user interface in different languages.

An example of a mark content text location:



This improvement was already introduced in Tekla Structures 2022 SP2.

9.3 Key plans handled correctly in multilingual projects

Now key plans are handled and shown correctly in drawings also when the original model language and the current Tekla Structures language differ. This makes the collaboration easier in multilingual projects. The key plan information is now saved in the layout file (`.lay`). Earlier, the key plans were not found and an error message was displayed.

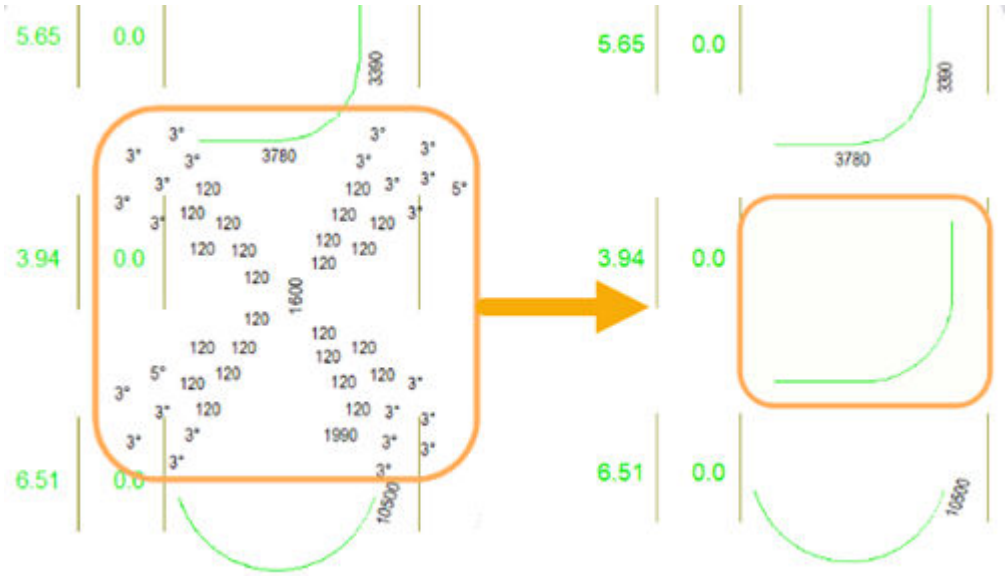
9.4 Improved pull-out pictures

Simplified rebar geometry in pull-out pictures

Rebar pull-out pictures now use the simplified Rebar Shape Recognition (RSR) geometry, which includes true arcs instead of segmented arcs. Where RSR recognizes a bent bar as straight, the straightened geometry is used.

Small arc segments in the pull-out pictures of rebars with curved legs are no longer showing any dimensions, bending radius, or bending angle graphics.

You can now create as simple as possible rebar pull-out pictures out of the most complex rebars so that the rebars can be visualized in an easily understandable way in drawings and reports.



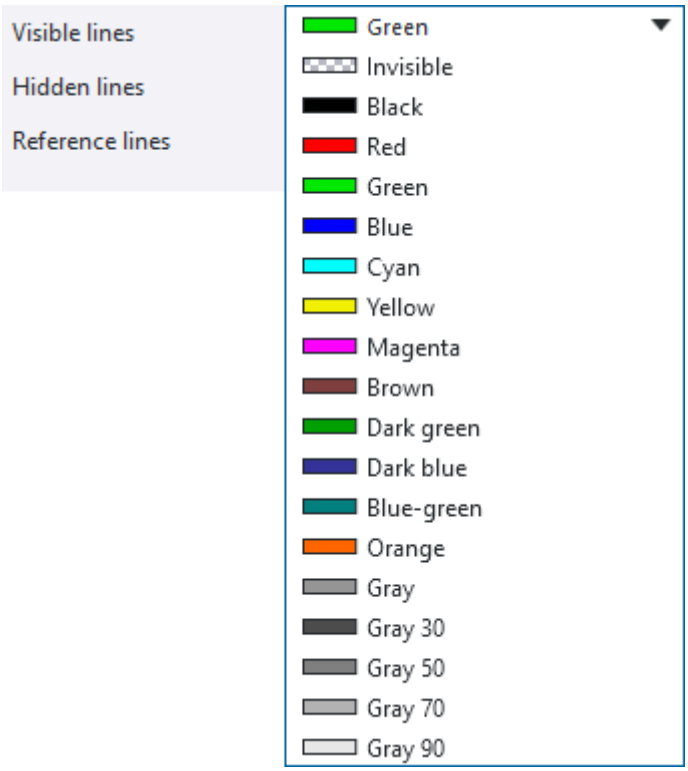
Other rebar pull-out picture improvements

- Rebar pull-out pictures of bars that have multiple arc legs, or arc and straight legs, now include a dimension showing the total length of the bar.
- Previously, the bending angle tolerance for rebar pullouts was 0.2 degrees, which means that angles within 0.2 degrees of 90 or 0 were not displayed. The bending angle tolerance has now been increased to 0.5 degrees, to match the **Rebar shape manager** default value. This means that angles within 0.5 degrees of 90 or 0 are not displayed.

9.5 Colors indicated with names

The drawing property pane drop-down menus where you can select colors for various drawing objects now contain the names of the colors. This improves

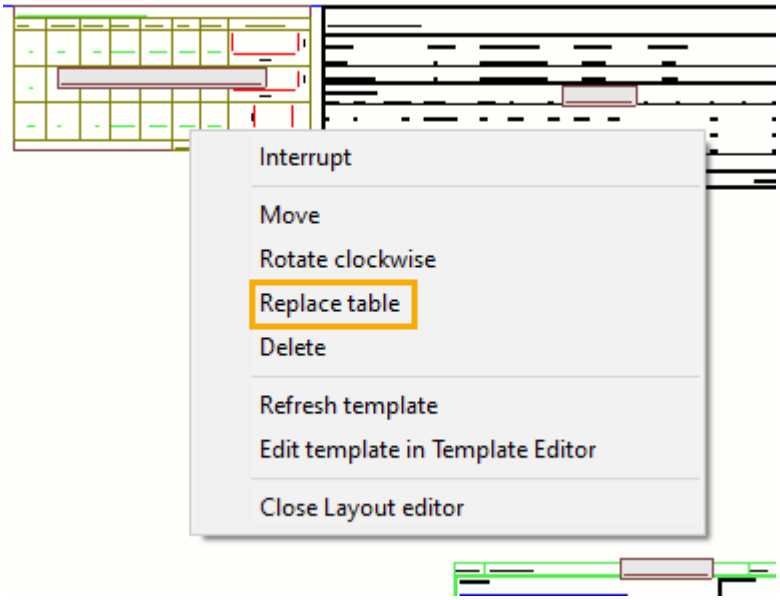
the software's accessibility by making it easier to identify the colors, for example.



9.6 Improvements in Layout editor

New command to replace a table in a layout

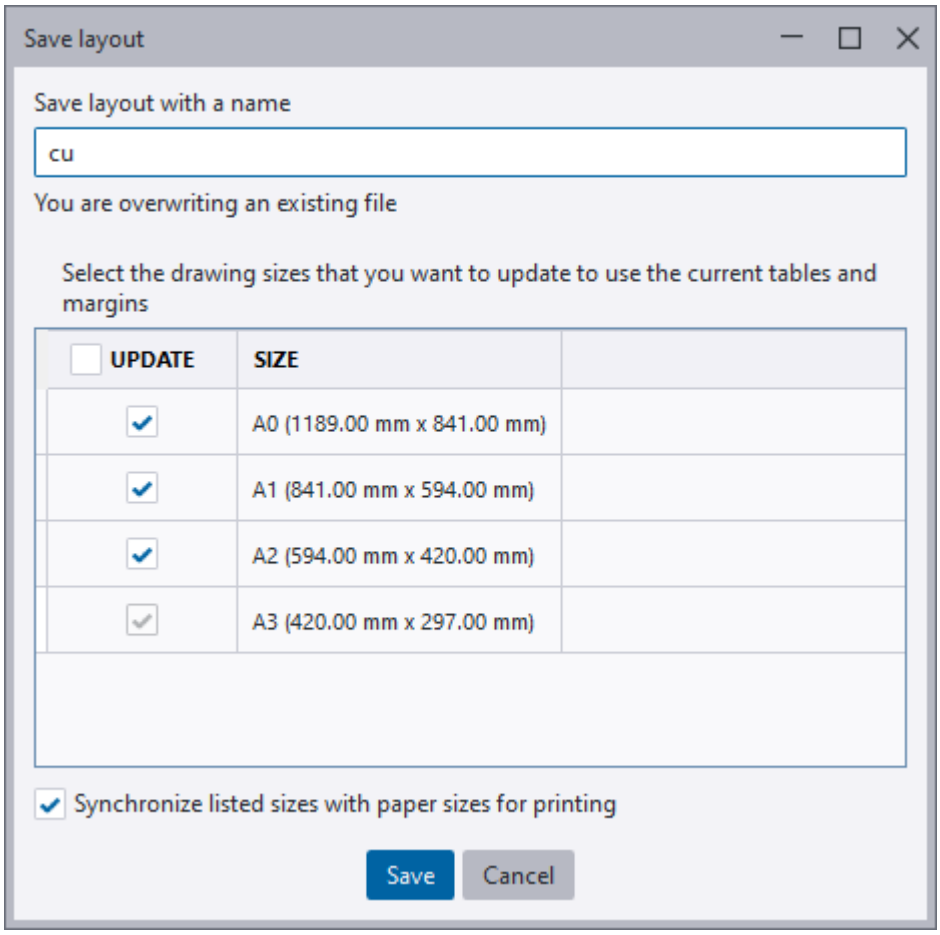
With the new **Layout editor** context menu command **Replace table** you can replace tables in your layout. To replace a table, right-click the table in the layout and select **Replace table**.



Replacing a table preserves all the settings that you have defined for the table that you replace. The new command eliminates the need to first remove a table in the layout, then add a new template, set the anchor point and alignment, and finally connect other tables around the new one.

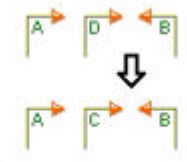
Better usability in the Save layout dialog box

The user interface and the usability of the **Save layout** dialog box in **Layout editor** have been improved.



- The dialog box now has a minimum size, and it cannot be minimized so that the buttons are no longer visible.
- The dialog box now remembers its last location before closing.
- The **Save layout with a name** box is now wider than before.
- The **Update** and **Size** headers now use the same font.

9.7 New macro for relabeling section views



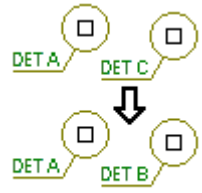
Relabel section views

Relabel section views is a new drawing macro for updating section view labels. When section views have been removed from a drawing, this macro can be used for relabeling all the section views to have continuous numbering again.

This improvement was already introduced in Tekla Structures 2022 SP1.

9.8 New macro for relabeling detail views

Relabel detail views is a new drawing macro for updating detail view labels. When detail views have been removed from a drawing, this macro can be used for relabeling all the detail views to have continuous numbering again.



Relabel detail views

This improvement was already introduced in Tekla Structures 2022 SP1.

9.9 Drawing content manager - Cumulative column sorting

In Drawing content manager, the column sorting is now cumulative. Click a column to sort by that column first and then hold down **Shift** and click another column to secondarily sort by that column.

This improvement was already introduced in Tekla Structures 2022 SP4.

9.10 Drawing bolts perpendicular to parts

Earlier, the advanced option XS_DRAW_BOLTS_PERPENDICULAR_TO_PART_IN_SINGLE_DRAWINGS only worked in single-part drawings. Now it also affects how bolts are shown in single-part drawings included in multi-drawings, and in single-part views in assembly drawings.

This improvement was already introduced in Tekla Structures 2022 SP2.

9.11 Improvements in drawing opening performance

The most time consuming calculations have been identified and improved. Opening drawings containing the following types of objects is now considerably faster:

- Hatches in visible areas
- Large DWG reference files
- Large STP reference files
- Hole or recess symbols
- Complex concrete parts and profiles
- Cut rebar mesh
- Circular spiral rebars using the filled line representation
- Thousands of rebars

9.12 Rendering texts faster in FOG rendering

Text rendering is faster now in drawing FOG rendering.

To use FOG, set the advanced option XS_DRAWING_RENDERING_ENGINE to FOG. The default value is GDI.

9.13 Other drawing improvements

- The **Drawing tools** macro has been removed from the **Applications & components** catalog.
  - The **Create fillet**, **Create round chamfer**, **Create straight chamfer**, and **Copy with offset** commands are all available on the drawing ribbon.

    - The **Create moment connection symbols** macro is now available in the **Applications & components** catalog.
- The mark leader line point tolerance circle has been reduced, making it possible to have smaller line segments in the leader line.

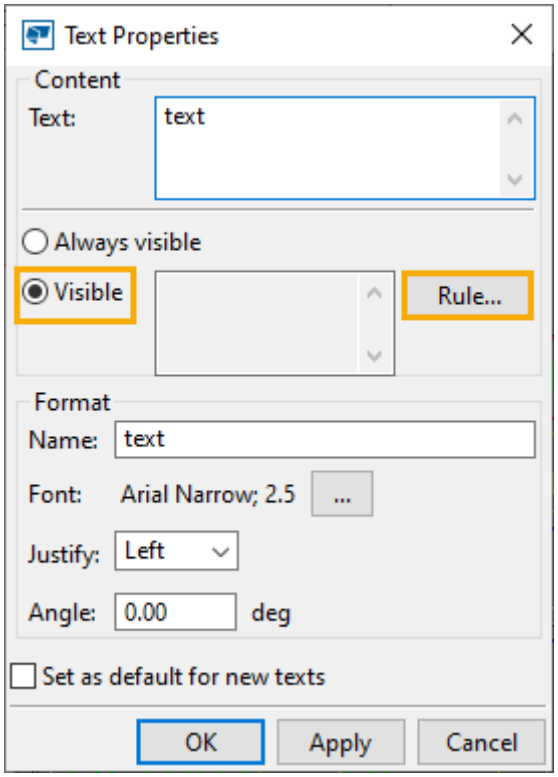
10 Improvements in Template Editor, templates, and reports

There are many important improvements in Template Editor and template creation.

10.1 Template Editor improvements

- Dialog box button keyboard shortcuts **Alt+O** for **OK** and **Alt+C** for **Close** now work.

- You can now define a visibility rule for shape and text objects. The rule result should be either true or false.



- Added two string functions for formulas and rules to combine a list of values to a single string that has list items separated with an optional separator.

  `join(";"A", "", "C", "D")` will give "A;C;D"

  `join2(";"A", "", "C", "D")` will give "A;;C;D"

- When you changed the display scaling factor, the side pane could become too narrow to use. Now when Template Editor starts, it checks the scaling factor and, if required, adjusts the side pane width, and restart automatically.
- The **File** menu has a new command **Save as version**, which allows you to save a template as a previous version template (like 4.0 (Tekla Structures 2020) or 3.6 (Tekla Structures 2019i or older)). Also when a template is in an older version format, and you save the template, Template Editor asks whether to keep the version format or update to a newer version format.
- Previously, if you did not want any page breaks in the template output, you needed to set the page height to a big value. Now you can define in the page properties that the template does not output page breaks.
- You can use the new PAGES attribute to show the total number of pages in the report with the GetValue("PAGES") function.

- The fvf() function can now read from text files that have UTF-8 byte order mark (BOM). The fvf() function also supports empty values with an optional (5th) parameter, when the parameter is TRUE or 1.
- When the CopyField() function did not find the source valuefield, the formula or rule processing was stopped. Now the CopyField() function returns "" if it cannot find the source valuefield, for example, when the source valuefield row is not output at all.
- Copying and pasting a text object that has the '$' character as its only content fails. This issue has now been fixed.

11 Building hierarchy - create and manage levels and spaces

You can use **Building hierarchy** to define a location breakdown structure for one building in your model.

Building hierarchy has a default hierarchy structure, project > site > building > level > space. You can add levels and spaces to the model by either importing them from a reference model, or creating them directly in your model. A level is a horizontal plane at a specified elevation within a building. Spaces are volumes that provide for certain functions, such as rooms, within a building.

Set the `USE_INTEGRATED_BUILDING_HIERARCHIES` advanced option to `TRUE` to use **Building hierarchy**.

You can find to the building hierarchy commands on the **Manage** tab on the ribbon:

- **Building hierarchy**
- **Level**
- **Space**

You can also create views on the levels. To create a view, go to the **View** tab on the ribbon and click **New view** --> **On selected levels**.

The building hierarchy definitions and the object locations in the hierarchy are common for all users of the model. Building hierarchy is shared when using Tekla Model Sharing.

12 Tekla Model Sharing improvements

Tekla Structures 2023 comes with the following enhancements related to Tekla Model Sharing. Some of these improvements were already introduced in Tekla Structures 2022 SP7.

12.1 Improved sharing of drawing versions

Previously, sharing of drawing versions in Tekla Model Sharing did not work as expected and drawing versions got lost when you wrote out. Now, the drawing versions are not deleted when you write out. Additionally, the deletion of unnecessary drawing files can be controlled by using advanced options.

Controlling whether unnecessary drawing files are deleted now works the same way as with multi-user models. Use the advanced options `XS_DELETE_UNNECESSARY_DG_FILES` to define whether unnecessary drawing files are deleted and `XS_DELETE_UNNECESSARY_DG_FILES_SAFETY_PERIOD` to define the time frame after which unnecessary drawing files are deleted.

When you set `XS_DELETE_UNNECESSARY_DG_FILES` to `TRUE`, the `.dg` files older than 7 days, which is the default safety period, will be deleted from your local model and and from other users in the same model. The `XS_DELETE_UNNECESSARY_DG_FILES_SAFETY_PERIOD` advanced option defines how long the drawing files are saved. The default safety period is 7 days.

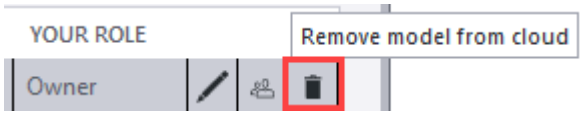
12.2 Deleted drawing files can be restored

Now, in Tekla Model Sharing, drawing files are restored if the `.dg` files have been accidentally deleted. Deleted drawings are copied to the `ModelSharing\BackUpEnv` folder and are checked against to the drawings on the **Drawing**

list. The `.dg` files are read automatically from the `BackUpEnv` folder when another user reads in the packet that has been written out after the drawing deletion.

12.3 New icon and clearer warning message for model deletion

On the **Shared models** dialog box, when you click the **Remove from cloud** button, the button has a new icon.



Additionally, a more descriptive warning message is displayed when you click the button. Now the warning informs that removing the model will delete the model from all users.

12.4 Faster reading in with plugin components

Previously, reading in the sharing changes in Tekla Model Sharing was sometimes extremely slow if the model contained a large number of custom components that had been duplicated from plugin components with an identical name. A warning dialog box was shown, and you had to click the **OK** button multiple times on the dialog box to pass the warnings and being able to continue.

Now, the components are no longer automatically updated when you read in. This results in faster performance and fewer false modification conflicts, and no warnings are shown.

12.5 Improvements in Management Console for Tekla Model Sharing

The user interface of the Management Console for Tekla Model Sharing has been extensively updated. The look and feel has been updated to be consistent with other Trimble cloud services.

Instead of lists, the user interface is now organized into tables. With any table, you can now:

- Filter all table content
- Select which columns are visible
- Export data as CSV

There is now a separate table where administrators can check which models a user has access to, and remove a user from multiple shared models at the same time.

In the **Models** table, it is now possible to do some tasks for multiple models at the same time. You can now:

- Download the latest baseline for multiple models
- Delete multiple models.

13 IFC improvements

In the IFC4 export, Tekla Structures 2023 introduces new subtypes for IFC entities, a completely new export option for cast-in-place objects, a new option to select the appropriate base point export system, and export hierarchy improvements. Additionally, some new entity types are now available in the property set definition, and the rebar set export has been improved both in the IFC2x3 and the IFC4 export. The IFC object conversion has also some improvements.

13.1 IFC4 export

New setting for cast-in-place objects

The **IFC4 Export** dialog box contains a new **Cast-in-place export** setting, which allows you to select more precisely what to include in the cast-in-place export. The options are **Pour units or pour objects** and **CIP cast units or parts**. This setting replaces the earlier **Pours** check box.

This improvement was already introduced in Tekla Structures 2022 SP2.

IFC4 export hierarchy improvements

Previously, the IFC4 export ignored the IFC export hierarchy in the part UDAs, for example, **IFC building name** and **IFC building storey name**, and the hierarchy was read from the project UDAs. Now the IFC4 export reads the IFC export hierarchy from the part UDAs.

If you do not select **Spatial hierarchy from Organizer**, Tekla Structures first tries to take the export hierarchy from the part UDAs. If the export hierarchy is not defined in the part UDAs, the hierarchy is taken from the project UDAs.

This improvement was already introduced in Tekla Structures 2022 SP6.

New subtypes available

New subtypes have been added for the following IFC entities:

IfcColumn

IfcBuildingElementPart

IfcDiscreteAccessory

IfcMechanicalFastener

IfcMember

IfcPlate

IfcRailing

IfcSlab

IfcStair

IfcWall

Improvement in rebar export

The IFC4 export now works with both of the XS_EXPORT_IFC_REBARSET_INDIVIDUAL_BARS values, `TRUE` and `FALSE`, when you export the selected rebar set, and rebar assembly rebars are no longer exported as a rebar set. When this advanced option is set to `FALSE`, the rebar set groups inside rebar assemblies are exported, and when `TRUE`, the individual bars are exported.

New option to select appropriate base point export system

Now you can select which system to use when you export to IFC4 and the location is based on a base point. When you have defined a base point for **Location by** in the **IFC4 export** dialog box, you can use the new setting, **Base point export**, to ensure that the collaboration works with other parties in the project. The available options are **IfcMapConversion** and **IfcSite coordinate system**.

IfcMapConversion converts model's local coordinate system into the global coordinate system, and it is needed, when the IFC4 format that complies to the IFC4 schema is required.

IfcSite coordinate system converts coordinates in the IFC model for each object separately, and it can be used to produce an IFC4 file that you can view in most IFC viewers, including Trimble Connect. The same conversion method is also used in the IFC2x3 export.

This improvement was already introduced in Tekla Structures 2022 SP7.

13.2 IFC2x3 export

Due to some invalid fittings, the IFC2x3 export behaved incorrectly when trying to apply these fittings in a certain base point use case. Now invalid fittings are ignored in the IFC2x3 export.

13.3 Other IFC2x3 and IFC4 export improvements

- When you exported rebar set groups (`XS_EXPORT_IFC_REBARSET_INDIVIDUAL_BARS` was set to `FALSE`), UDAs were not exported correctly with the exported group. Now the UDAs that are set at different levels for the whole rebar set or for the individual rebars are exported correctly with the rebar set group to IFC4 and IFC2x3.
- Rebar set modifier UDAs are now exported correctly to IFC4 and IFC2x3. This now works correctly both when exporting groups (`XS_EXPORT_IFC_REBARSET_INDIVIDUAL_BARS=FALSE`) and when exporting individual bars (`XS_EXPORT_IFC_REBARSET_INDIVIDUAL_BARS=TRUE)`. Previously, exported rebars would not have any UDA values when the UDA values were exported as a property set.
- IfcStair is now available for parts and IfcDiscreteAccessory for assemblies as an IFC entity. Also selecting IfcRamp for parts, assemblies, pour objects, or pour units now works.
- The following entity types have been added in the **Property set definitions** dialog box for both IFC2x3 and IFC4 export, with the supported Tekla Structures object properties:

  IfcBearing

  IfcBridgePart

  IfcChimney
- The **Property set definitions** dialog box now supports better the creation of the boolean property type. Also, an empty value stays empty when exported, it is no longer forced to TRUE.

13.4 IFC object conversion improvements

The IFC object conversion now swaps handle points (start and end points) for I profiles, and after the IFC object conversion, the start and end point order in the native Tekla Structures objects is similar to the order in the IFC objects.

14 Drawing DWG/DXF export improvements

We have improved the quality and usability of the DWG/DXF export considerably by bringing in some new functionality and changing the existing functionality.

14.1 New option to export views located outside drawing area

Now you can select whether to include in the drawing DWG/DXF export the drawing views that are located outside the drawing area. A new check box, **Include views outside the drawing frame**, has been added in the **Export drawings as DWG/DXF** dialog box for this purpose. If you do not select the check box, the export excludes the drawing views that are outside the drawing area. The views that are partially inside the drawing area are always exported by default. Previously, the views outside the drawing area were always exported, and there was no way to export only the views inside drawing area.

By default, the new check box is not selected.

When the **Include views outside the drawing frame** check box is selected, the export preview is enlarged to show all included views.

14.2 Template names included in export block names

The template names are now visible in the DWG export block names.

New block names look like this:

revision-8916-1611

drawing_title_ga-8916-1610

Previously, the text “Unknown”was used instead of the template name:

Unknown-6004-1611

Unknown-6004-1610

14.3 Improved drawing preview

There are several improvements in the export preview funtionality:

- Now the export preview shows exactly what is going to be exported.
- The preview now shows the drawing also when you start the export from the modeling mode.
- Clicking the preview window now updates the view.

14.4 Other improvements and fixes in drawing export

- Sometimes, due to accuracies, circular bolt hole symbols were exported segmented in the DWG/DXF format. This issue has now been fixed.
- Earlier, if a drawing had invalid symbols, some texts and part marks might not be exported in the DWG/DXF format. This issue has now been fixed.
- The DWG/DXF export did not work properly if imperial scale was used. This issue has now been fixed.

15 Updates in tools for automated precast fabrication

Tekla Structures 2023 offers a host of new and features and important improvements in the Unitechnik and ELiPLAN export tools.

15.1 Export Unitechnik (79)

Main tab

You can now export meshes into individual files with the new setting **Split meshes to individual files**. Each exported file contains one STEELMAT block only.

TS configuration tab

You can now specify whether the double wall shells are swapped by using the new **Allow swapping of shells** setting.

Embeds tab

- You can now select the embeds to export by specifying a filter in **Embed filter**.
- You can use the new **Sorting embeds by** setting to select the export order of the embeds. The options are:

  ID, descending (default)

  ID, ascending

  Distance to zero point

  Name, descending

  Name, ascending

  Class, descending

  Class, ascending

Reinforcement tab

- The **Export meshes as** option **Turned to pallet** has been renamed to **Turned to pallet (longest wire on X axis)**, and a new **Turned to pallet (bent wire on X axis)** option has been added to export meshes rotated to pallet plane with bent wires parallel with the X axis of the pallet.

  This improvement was already introduced in Tekla Structures 2022 SP2.
- There are now separate options **Reinforcing bars diameter** and **Braced girders diameter** for specifying the diameter for reinforcement and braced girders.

Line attributes tab

- You can now split the edge of the exported contour by using the new **Edge chamfer splits line** setting to have more line attributes exported for one edge.

Other Unitechnik improvements

- The export of the reinforcement from rebar assemblies is now supported. Rebar assembly types **Mesh**, **Bent mesh**, and **Roll mat** are collected and exported as mesh. The rebar assembly type is defined in the rebar assembly properties. If the rebar assembly type is undefined or **Cage**, the rebar assemblies are exported as cages. Rebar assemblies of the type **Braced girder** are exported as braced girders, and the assemblies of the type **Embed** are exported as mountparts. As the cage is not supported in Unitechnik versions below 6.1.0., the cage rebars will be exported as loose.
- Information about the export progress is now shown in the export progress window, as well as in the log file.
- Previously, loose reinforcement was exported as mesh. This issue has now been fixed.

15.2 Export ELiPLAN file (68)

Support for rebar assemblies

The export of rebar assemblies is now supported. Rebar assemblies are exported as bounding boxes.

Parameters tab

You can now open the exported file in the associated application after the processing has been completed by using the new **Open exported file after processing** setting on the **Parameters** tab.

Data settings tab

You can now export sub-materials of concrete material by using the new **Include sub-materials** setting. Sub-materials have a new section in the data conversion file called #SUBMATERIAL.

This improvement was already introduced in Tekla Structures 2022 SP2.

Plotter data tab

- The option to export weep holes has been moved from the **Weep holes** tab to the **Plotter data** tab.
- You can now use the new **Plot cutout/embed** option, **Automatically**, for automatic accessory recognition based on shape.

Weep holes tab

- You can now specify the following offsets on the **Weep holes** tab:
  - An offset for weep holes at side pockets with the new **At side recess/ opening** option.
  - An offset for weep holes at recesses or openings with the new **At end zones recess/opening** option.
  - An offset for weep holes at lifting loops with the new **At lifting loops** option.
  - An offset for weep holes at notches with the new **At notches** option.
- Now you can also merge weep holes if they are within the distance specified for the new **Merge weep holes, closer than** option.
- Previously, weep holes could be exported inside recesses and other elements inside cast unit. This issue has now been fixed, and the export of such weep holes is now prevented.

Other ELiPLAN improvements

- Information about the units selected for element dimensions and rebar lengths is now written in the header in version 3.0 of the ELiPLAN export.
- Element corner cuts created by line cuts in the model are now exported with a dedicated type code to the ELiPLAN file.
- Now height is also exported for user-defined profiles.
- Previously, cuts were exported together with filled cores when they were modeled in the same location and with the same size as the filled cores. This issue has now been fixed and cuts are not exported.
- The export of complex walls created by multiple concrete parts has been improved.

16 DSTV NC improvements

Tekla Structures 2023 contains a fully renewed converter for converting DSTV files to DXF drawings and improvements in inner corner radius handling and weld preparations. Tapped holes are now supported in the NC export.

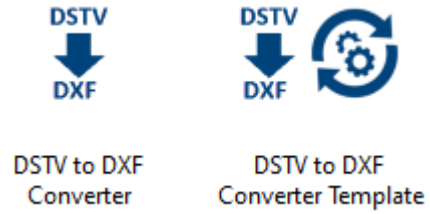
16.1 New DSTV to DXF converter

The fully renewed DSTV to DXF converter makes it easy to convert DSTV NC files into DXF drawings to be used in fabrication production solutions, such as plate nesting or production management. Many production automation solutions, especially some plate nesting solutions, only support the import of DXF files, not DSTV NC files.

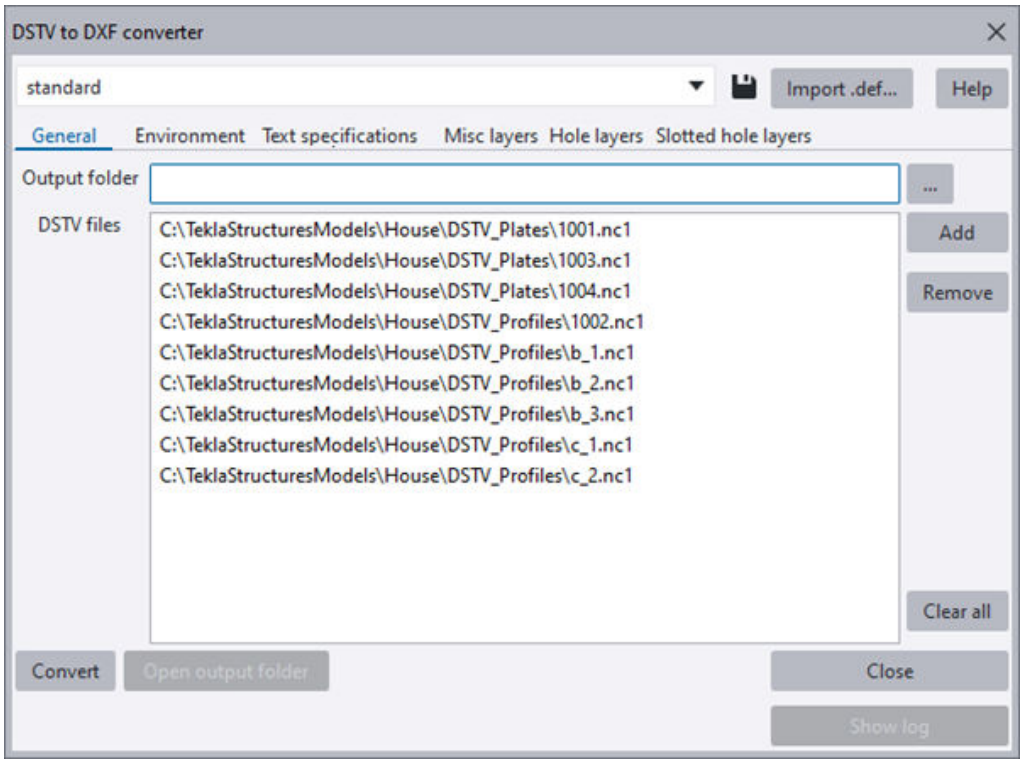
The new DSTV to DXF converter is considerably easier to set up and use than the old command line based converter. The new converter has an easy-to-use interface for the detailer or production manager to set up and manage the conversion of DSTV NC files into DXF for use in their production workflow. It provides key layer and quantity information in the format expected by the production solutions. The new converter also supports the automation of the conversion processes through an improved command line interface (CLI) and macro templates, which make it easy for you to set up and customize your automation routines.

You no longer need to go to the Tekla Warehouse to get the converter, it is readily available in the **Applications & components** catalog. The converter extension is also available in Tekla Warehouse for older Tekla Structures versions.

1. To open the **DSTV to DXF Converter**, in the side pane, click the  **Applications & components** button, search for the **DSTV to DXF Converter**, and double-click the **DSTV to DXF Converter** button.



The **DSTV to DXF Converter** dialog box is displayed.



2. Set the desired properties.

   General tab: Define the output folder. By default, the output folder is `\NC_dxf` under the model folder. Add the `.nc` files.

   Environment tab: Define the environment-specific settings.

   Text specifications tab: Define the text properties and select information to include in the converted file.

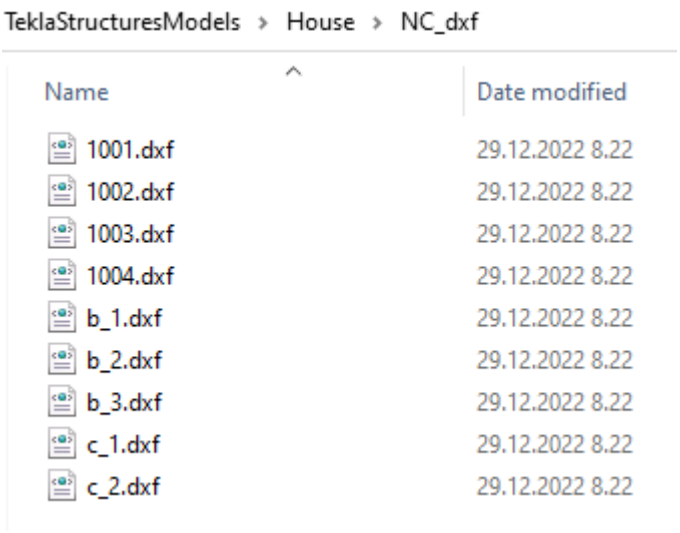
   Misc layers tab: Define miscellaneous layers.

   Hole layers tab: Define layers fro holes.

   Slotted hole layers tab: Define layers for slotted holes.

3. Click the **Convert** button.

The DXF files are created:



Convert using the converter template

Tekla Structures 2023 also provides a converter template that you can use to automate the conversion process. All you need to do is to fill in the necessary information in the template file in a text editor. Once you have it set up, you do not need open and load the settings in the **DSTV to DXF Converter** dialog box, you can do the conversion just by double-clicking one button.

1. In **Applications & components**, right-click the **DSTV to DXF Converter Template** button, click **Edit**, and select a suitable text editor.

   This opens the `DSTVtoDXFConverterTemplate.cs` template located in the ..\TeklaStructures\<version>\bin\<Env>\Common\macros\modeling folder.

2. Scroll down to modify the strings to suit local environment and user preferences:

   ```
   /**** Modify these strings to suit local environment and
   user preferences. ****/

   private static string attributeFile = @"standard";

   private static string inputFolder = @"./DSTV_Profiles";

   private static string outputFolder = @"./NC_dxf";

   private static string files = @"PL*.nc1, BPL*.nc1,
   FLT*.nc1";

   private static bool overwrite = true;
   ```

   - `standard`: attribute file name you want to use for conversion
   - `./DSTV_Profiles`: input folder in which single and batch files are searched for
   - `./NC_dxf`: output folder where to create the *.dxf files

- `PL*.nc1, BPL*.nc1, FLT*.nc1`: list of file names each enclosed in quotes or wild card
- `true`: option to overwrite or not the existing *.dxf files.

3. Save the template file.
4. To run the conversion using the template, in **Applications & components**, double-click the **DSTV to DXF Converter Template** button.

   After the process ends, a message will give you information about the conversion.

Old DSTV to DXF converter available as TSEP package

The old DSTV to DXF converter tool is now available as a separate extension and can be installed as a TSEP package from Tekla Warehouse.

16.2 Inner corner radius handling improvement

Now if the inner corner radius is set to be too large on the **Holes and cuts** tab in the **NC file settings**, an NC file is not created to avoid manufacturing errors. The `dstv_nc.log` file in the model folder shows the error messages, and indicates the parts that have failed and the maximum allowed inner corner radius. This helps you to ensure that you transfer your model data error free for manufacturing.

For the radius to be valid, the hole (including angles) must be equal to or greater than radius x 2. For example, a hole with angles needs to be even smaller than radius x 2, so that it would not hit the weld preparation area.

16.3 Weld preparation improvements

In certain situations, weld preparations on a beam flange caused incorrect NC output. These issues have now been fixed.

- Earlier, Tekla Structures produced defective NC files for I beams that had weld preparations on the flange that reach the exact middle of the flange thickness. The weld preparations were either missing completely or had an incorrect shape. Now the weld preparations work correctly in this case.
- Earlier, certain weld preparations were not created correctly for I beam flanges when the flange had cuts that made the ends non-rectangular. Now the weld preparations are created correctly in this case.

16.4 Tapped holes support

Tapped holes are now supported in the NC export, including countersunk holes. Now the advanced option XS_CNC_HOLE_DIAMETER_ROUNDING also affects tapped holes in NC files.

17 Other interoperability improvements

Tekla Structures 2023 introduces several improvements in handling reference models: refreshing the selected reference models, hiding all reference models at one go, saving empty reference model groups, and transparent rollover highlight. Additionally, the point cloud clash check has been improved, and now you can also add multiple point clouds at one go. **Layout manager** now supports the new `.tflx` file format for Trimble FieldLink. Welds are now supported when uploading `.tekla` models to Trimble Connect. There are also new ways available to collaborate with Trimble Connect.

17.1 Reference models

Refresh selected reference models

You can now refresh the reference models that you have selected in the reference model list by using the refresh button  .

Previously, you could only refresh all reference models.

This improvement was already introduced in Tekla Structures 2022 SP2.

Save empty reference model groups

The reference model list now supports saving of empty reference model groups. Previously, when you created a reference model group but did not add any reference models in the group, the group disappeared when you reopened the model.

This improvement was already introduced in Tekla Structures 2022 SP2.

Rollover highlight for reference models is now transparent

Previously, with rollover highlight, reference model objects were highlighted with solid rendering.

Now, the rollover highlight color of reference model objects is transparent, and the objects behind reference model objects can be seen and selected.

This improvement was already introduced in Tekla Structures 2022 SP4.

Other reference model improvements

- The reference model import now supports files created in the IFC4.3 format.
- Missing reference models are now listed when you refresh  the reference models and some models are missing.

17.2 Point clouds

Point cloud clash check

- Clash check between point clouds and pour objects is now supported.

  This improvement was already introduced in Tekla Structures 2022 SP1.
- Point cloud clash check now also checks parts that are inside components.

Attach multiple point clouds

You can now insert multiple point clouds at one go by dragging point cloud files from Windows Explorer.

This improvement was already introduced in Tekla Structures 2022 SP2.

17.3 Trimble Connector

Weld support in .tekla models

Welds are now supported when uploading `.tekla` models to Trimble Connect.

The default properties in the Default Environment:

```
"weld": ["WELD_SIZE1", "WELD_SIZE2", "WELD_TYPE1", "WELD_TYPE2",
"LENGTH", "WELD_ASSEMBLYTYPE", "WELD_EDGE_AROUND",
"WELD_INTERMITTENT_TYPE"]
```

New in Trimble Connect collaboration

Perform model review using Trimble Connect

The Trimble Connect model reviewer extension allows you to collaborate between Tekla Structures and Trimble Connect using property sets. Project participants can add property sets to model objects in Trimble Connect which can then be viewed and colorized in Tekla Structures. This supports more

efficient model review and approval workflows, as well as erection, fabrication and on-site workflows where the data is tracked in Trimble Connect.

Compare 3D models in Trimble Connect

You can now share Tekla Structures models (`.IFC` or `.tekla`) with any Trimble Connect for Windows user, and allow the users to compare and view the differences between model versions. See Trimble Connect help for more information.

17.4 New file format in Layout manager

Layout manager now supports the new `.tflx` file format for Trimble FieldLink version 6.3 and onward. You can use this new file format for both importing and exporting layout data.

This improvement ensures smooth interoperability between the latest versions of Trimble products, and supports a full Trimble workflow between Trimble FieldLink and Tekla Structures.

This improvement was already introduced in Tekla Structures 2022 SP6.

18 Improvements in components

There are several improvements in concrete components and steel components in Tekla Structures 2023.

Tekla Structures 2022 service packs also introduce improvements to components, see:

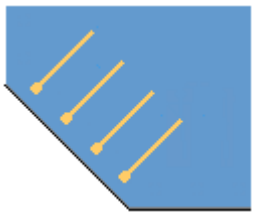
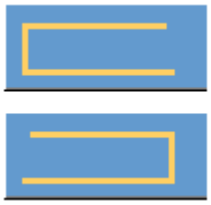
- 2022 SP1: New features and improvements
- 2022 SP2: New features and improvements
- 2022 SP4: New features, improvements, and important fixes
- 2022 SP5: Important improvements and fixes
- 2022 SP6: Important improvements and fixes
- 2022 SP7: Important improvements and fixes

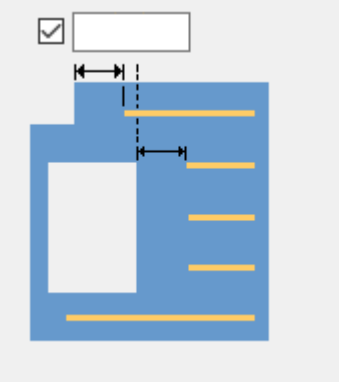
18.1 Improvements in component update performance

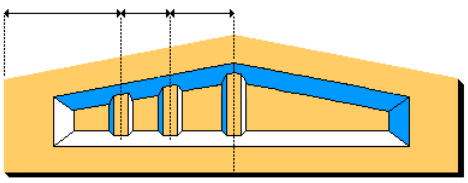
Component update performance has now been improved in hierarchical cases, where the objects created by a component are used as input objects for other components. For example, the **Wall layout** component creates wall panels, which are then used as input objects for reinforcing or other detailing components. Previously, the update of the main component could trigger multiple updates of each detailing component, which caused slowness in the operation. This has now been improved by removing the unnecessary update calls.

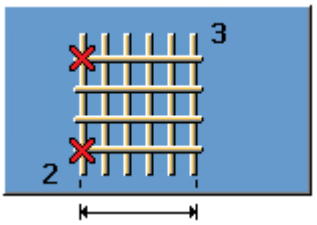
18.2 Concrete components

Component	Description

Border rebar for single edge (93)	**Border rebar for single edge (93)** has many improvements in Tekla Structures 2023:
	• You can now create edge bars in addition to pin bars (U bars). You can define the edge bars on the new **Edge bars** tab.
	• The handle points of the rebars are now placed on the edges of the concrete part. Previously, the handles were inside the concrete.
	• On the **Pins** tab, you can now select the direction of the pin bars for bevel edges.
	 
	• On the **Pins** tab, you can now select the pin bar direction.
	 
	• On the **Pin spacing** tab, you can now select in **Creation method** what kind of spacing is used for the pin bars:
	  • **By exact spacings** creates fixed spacing between the pin bars.
	  • **By exact spacing value with flexible first and last space** creates regular spaces between the bars with adjusted first and

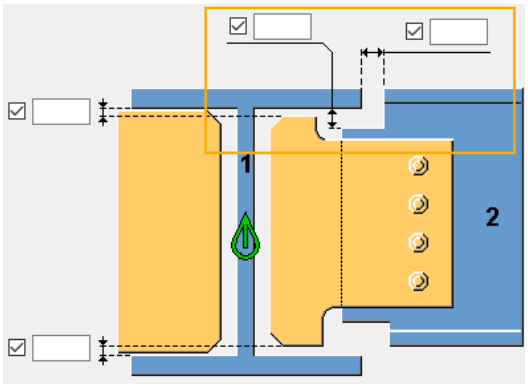
Component	Description
	last spaces to even out bar distribution. • On the **Pin spacing** tab, you can now define the minimum cover thickness for holes and notches.  • It is now possible to attach the rebars to the neighbor part.
Floor layout, **Wall layout**	• On the new **Property** tab, you can now define IFC4 entities on the part and cast unit level, and the concrete cover for rebar sets on the part level. You can define the properties separately for each layer. The IFC entities on the cast unit level are taken from the main part of the cast unit to which the layer belongs. • In **Floor layout**, on the **CIP filler part** tab, you can now select whether the filler parts are created using the same material as the layer.
Geometry detailing strip	The new **Extend detailing strip** option allows detailing strips to be extended over the whole part face when the geometry detailing strip is created as a single line. Setting the **Extend detailing strip** option to **Yes** will extend and fit the detail in both directions of the input line to the edge of the applied face. This

Component	Description
	provides more flexibility for the use of the tool. Detailing strips created within the wall layout are automatically extended. Previously, not all detailing types were extended in the wall layout connector. Now this issue has been fixed, which means that inner corners created with **Wall layout** work correctly for all detailing types from the geometry detailing strip.
Slab bars (18)	In Tekla Structures2023, the **Slab bars (18)** component is no longer available in the **Applications & components** catalog. You can use the **Mesh bars** and **Mesh bars by area** components to create reinforcement to concrete slabs or walls.
Lifting anchor (80)	**Lifting anchor (80)** now supports rebar assemblies as input objects. This allows you to create lifting anchors directly on rebar assemblies. For example, meshes or cages can now easily get anchors based on their center of gravity. Note that the distribution of the anchors is based on the main bars in the rebar assembly.
Tapered I beam (81)	• You can now use the component to create tapered concrete columns. • On the **Stiffeners** tab, there is now a new option for creating asymmetrical stiffeners. 
Rectangular area reinforcement (94)	• You can now specify a negative value for the concrete cover thickness.

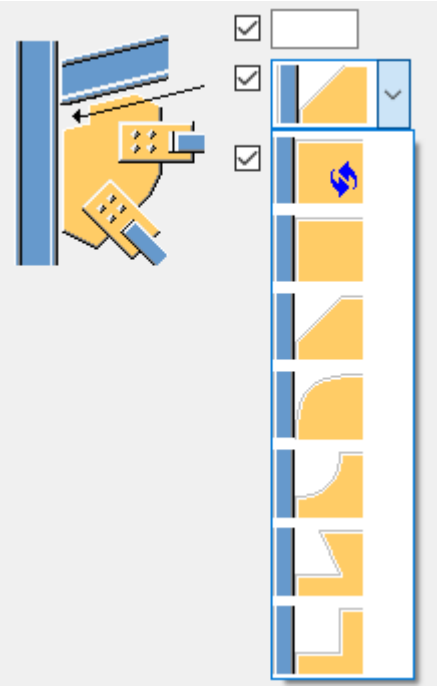
Component	Description
	• On the **Picture** tab, there is a new option for calculating area reinforcement using input points that define the direction for the creation plane. You can define the width for the area orthogonally on the line. 
Sandwich wall window	In **Sandwich wall window** creation, the handling of input points has been improved. The window is now created in the correct location regardless of the order in which the input points are picked. The options for setting window dimensions have been renamed as follows: • **Bottom and top corner points** (previously **2 points**) • **Bottom corner point, and width and height** (previously **Point 1 B H**) • **Top corner point, and width and height** (previously **Point 2 B H**) • **Bottom and top corner points, and height** (previously **2 points H**) The **Sandwich wall window** component instances created with previous Tekla Structures versions work as before.
Wall to wall connection	On the **Edge shape** tab, two new uneven wall edge shapes are now available.
Start number for reinforcement in system components	Previously, when you defined a negative start number for reinforcement in system components, the prefix was removed and the start number was set to 1. This issue has

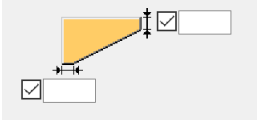
Component	Description
	now been fixed. It is possible to use a negative start number for reinforcement in system components.

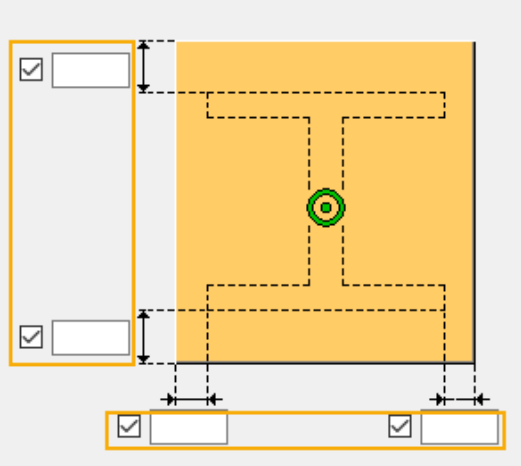
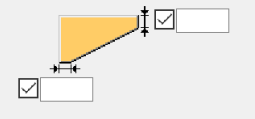
18.3 Steel components

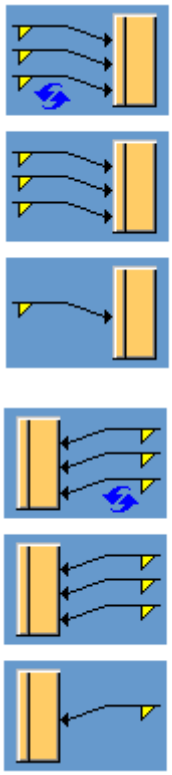
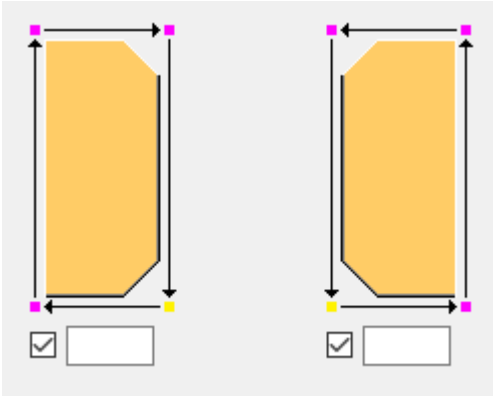
Component	Description
Turnbuckle bracing (S7)	On the **Connection** tab, you can now select to use the **Tensioner (7)** component as the connection type.
Bracing cross (19)	You can now define the bolting direction on the **Bolts** tab.
Tube gusset (20)	You can now define the bolting direction on the **Gusset conn**, **Brace bolts 1-3**, and **Cross plates** tabs.
Pipe column and beam panel zone (21)	On the **Panel parts** tab, you can now use **Taper profile orientation** to change the preferred direction of plates if the tapering type of the short column is **Buildup**.
Tube crossing (22)	You can now define the middle end plate properties on the **Brace conn** tab.
Shear plate full depth special (39)	You can now define the cope cut depth and length separately on the **Picture** tab. You can also select whether cope cut sizes are checked using the **Allow partial cut in fillet radius** option. 
Stiffened shear plate (17), **Haunch (40)**, **Corner bolted gusset (57)**,	You can now specify the **Finish** property for parts.

Component	Description
Wraparound gusset (58), **Hollow brace wraparound gusset (59)**, **Wraparound gusset cross (60)**, **Windbrace connection (110)**, **Bent plate (190)**, **Base plate (1004)**, **Stiffened base plate (1014)**, **Web stiffened base plate (1016)**, **Base plate (1042)**, **U.S. Base plate (1047)**, **Circular base plate (1052)**, **Cage ladder (S60)**	
Diagonal splice (53)	• You can now define the bolting direction on the **Bolts** tab. • On the **Bolts** tab, you can now select whether bolts are created parallel to the main part or the secondary part. 

Component	Description
Corner tube gusset (56), **Corner bolted gusset (57)**, **Corner gusset (63)**	On the **Gusset** tab, you can now define a chamfer in the inner corner of the gusset plate. 
Splice type 1 (56)	You can now define the bolt properties, slotted holes, bolt assembly, and bolt length increase separately for the main part and secondary part bolts.
Cage ladder (S60)	• On the **Parameters** tab, you can now use the **Stringer cuts** and **Stringer max. length** options to split the side rails by the defined length. • On the **Bolts** tab, you can now define the cut length, bolt assembly, bolt length increase, and slotted holes.
Tube column splice (65)	On the **Parameters** tab, you can now control the shear tab side for each face.
HSS Brace Special (66), **HSS Brace Special (67)**	• You can now use 3 separate welds instead of just 1 as previously. • The component is now created correctly when **Up direction** is set to **auto** on the **General** tab.

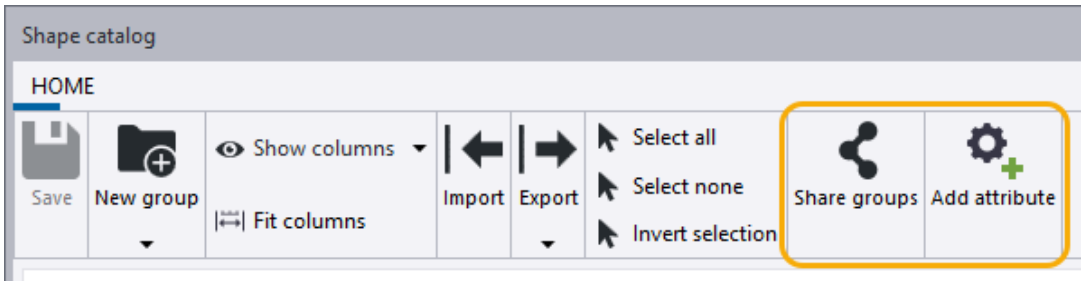
Component	Description
Stairs (S71), **Wooden steps pan (S72)**, **Polybeam pan (S73)**, **Z pan (S74)**	On the **Picture** tab, you can now define the vertical offset for the left and right horizontal landing at the top and bottom of the stringers.
Railings (S77)	On the **Bends** tab, you can now define the cut distance along the rails separately for the right and left rail end.
Two sided end plate (142)	You can now define the bolting direction on the **Bolts** tab.
Clip angle (141), **Two sided clip angle (143)**, **Shear plate simple (146)**, **Angle profile box (1040)**	On the **Angle box** tab, you can now define the bevel cut offset from the start or end for triangular angle box stiffeners. For **Angle profile box (1040)**, you can define the offset on the **Parameters** tab. 
End plate (144), **Shear plate simple (146)**	On the **Notch** tab, you can now select that the notch size is measured from the edge of the main beam flange and from the outer edge of the top flange of the main beam. 
Joist to column, type 1 (161), **2-Sided joist to column (162)**	On the **Plate** or **Cap plate** tab, you can now specify the width and length

Component	Description
	of the cap plate by defining the offsets from the main part edge. 
Joist to column, type 2 (163)	• On the **Seat** tab, you can now specify the assembly position prefix and start number for the seat profile. • On the **Angle seat stiffeners** tab, you can now define the bevel cut offset from the start or end for triangular angle seat stiffeners. 
Central gusset (169)	You can now define the bolting direction on the **Brace bolts 1 - 4** tabs.
Full depth S (185)	On the **Plates** tab, you can now define a gap between the secondary part web and shear tab for connections that have only one shear tab.
Bent plate (190)	On the **Bolts** tab, you can now define the number of welds created between

Component	Description
	the bent plate and secondary part, and the bent plate and main part. 
Base plate (1004)	You can now define a bolt comment on the **Bolts** tab.
Multiple stiffeners (1064)	It is now possible to rotate the stiffener polygons on the **Parameters** tab.  The value you enter determines the number of points by which the start point of the polygon is moved in the direction shown by the arrows.

19 Improvements in the shape catalog and Shape cleaner

Tekla Structures 2023 introduces two new ribbon buttons in the **Shape catalog** dialog box: **Share groups** and **Add attribute**.



The **Shape cleaner** application also has new useful settings for showing or hiding edges in shapes.

19.1 Share your groups of shapes with other users

If you are a Tekla Structures administrator or main user, you might have organized shapes into groups in a project. Now in Tekla Structures 2023, you can easily share the group structure so that your user-defined groups become system groups and are available to all users in the shared model.

Click  **Share groups** on the shape catalog ribbon to share your group structure with all users in the currently open Tekla Model Sharing model.

The other users in the shared model will see the shared groups when the users read in changes the next time.

19.2 Add new user-defined attributes to shapes

In addition to the shape properties that are shown by default in the shape catalog, you can now add user-defined attributes to the selected shapes.

Click  **Add attribute** on the shape catalog ribbon to define a new attribute for one or more selected shapes.

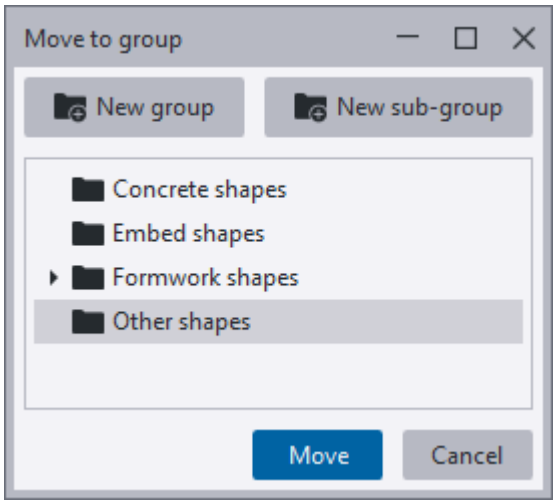
The user-defined attributes of a selected shape are shown at the end of the property list in the **Shape catalog** dialog box and in the **Select shape** dialog box, before the tags.

If you later need to modify or delete a user-defined attribute, select the attribute in the property list, and click  or  next to the name of the attribute.

Limitation: User-defined attributes of shapes cannot be shown in reports.

19.3 Move and copy shapes between groups

When you move or copy shapes to another group, in addition to dragging the selected shapes to a destination group, you now have the option to use a new dialog box to select the group for the shapes. In the **Move to group** and **Copy to group** dialog boxes, you can also click a button to create a new group or sub-group for the shapes, if needed.



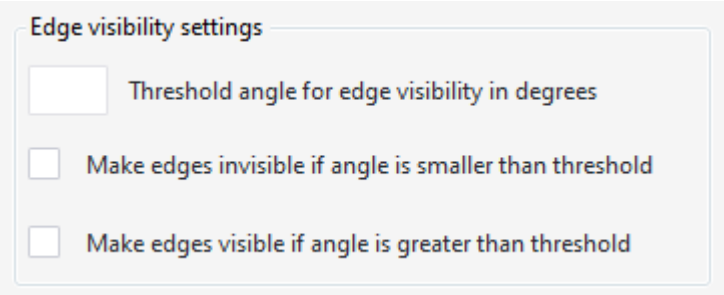
19.4 Units shown for shape properties

The property list on the right side of the **Shape catalog** and **Select shape** dialog boxes now shows units next to the shape property values and user-

defined attribute values. Units are shown for area, length, volume, and weight according to the **Units and decimals** settings in the **Options** dialog box.

19.5 Shape cleaner improvements

Using the **Shape cleaner** application, you can now adjust the visibility of edges in a shape by defining a threshold angle between neighboring faces. You can make edges either visible or invisible.



The edge visibility adjustments of each shape are stored in the shape geometry file (`.tez`), along with the other results of the shape cleaning.

Shapes with too many visible or invisible edges are not only a cosmetic issue, but 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 had too many edges visible.

20 Changes in advanced options

In Tekla Structures version 2023, there are some new advanced options, and some of the advanced options have been deprecated. Also, the functionality of some of the advanced options has been changed.

You can use advanced options for configuring Tekla Structures to suit the way you work, or to comply with specific project requirements or industry standards. You can change advanced options values in the **Advanced options** dialog box, or in the initialization files.

20.1 New advanced options

XS_DEFAULT_UNICODE_FONT_DRAWING_PRINTING

This new advanced option defines the default font that is used when the selected font for drawings and printing does not contain all of the characters used in the text. When a default font is defined, the characters are shown correctly even without embedding fonts. By default, the font is set to Arial Unicode MS.

XS_DIAGNOZE_AND_REPAIR_WRONG_UDA_TYPE

You can now enable the detecting and fixing of the incorrect user-defined attribute (UDA) value type in **Diagnose & repair** --> **Diagnose and change attribute definitions**.

If you edit the `object.inp` file by changing the UDA value type after the values are set, the UDA values of the incorrect type are not reported correctly, and you cannot change them.

When `XS_DIAGNOZE_AND_REPAIR_WRONG_UDA_TYPE` is set to `TRUE`, use 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.

XS_SUPPORT_TOOL_EXCLUDE_ALL_FILES

You can now prevent the support tool from preselecting all files for sending in your support request with the new advanced option `XS_SUPPORT_TOOL_EXCLUDE_ALL_FILES`. Previously, all files were selected by default, which could cause problems with large models. This advanced option must be set in the `user.ini` or `teklastructures.ini` file. Note that this advanced option does not work if you define it in the `options.ini` file.

New advanced options for special hole marks

Use the following new advanced options to define the contents of the **Size** element in marks for tapped and oversized bolt holes. Separate advanced options are available for workshop and site holes, and for fabrication drawings and general arrangement drawings.

- XS_SHOP_TAPPEDHOLE_MARK_STRING_FOR_SIZE
- XS_SHOP_TAPPEDHOLE_MARK_STRING_FOR_SIZE_IN_GA
- XS_SITE_TAPPEDHOLE_MARK_STRING_FOR_SIZE
- XS_SITE_TAPPEDHOLE_MARK_STRING_FOR_SIZE_IN_GA
- XS_SHOP_OVERSIZEDHOLE_MARK_STRING_FOR_SIZE
- XS_SHOP_OVERSIZEDHOLE_MARK_STRING_FOR_SIZE_IN_GA
- XS_SITE_OVERSIZEDHOLE_MARK_STRING_FOR_SIZE
- XS_SITE_OVERSIZEDHOLE_MARK_STRING_FOR_SIZE_IN_GA

New advanced options in rebar shape recognition

The following new advanced options define the default values for the tolerance settings that are used in rebar shape recognition:

- XS_REBAR_RECOGNITION_CURVE_TOLERANCE sets the default value for **Curve tolerance**
- XS_REBAR_RECOGNITION_EXTRA_POINT_SHORTENING sets the default value for **Extra point shortening**
- XS_REBAR_RECOGNITION_MAXCURVE sets the default value for **Max curve radius requiring bending**

If needed, these default values can be overridden by modifying rebar definitions in the rebar catalog (`rebar_database.inp`) or by using the **Shape recognition** user-defined attributes of individual reinforcement objects.

XS_REBARSET_MINIMUM_BENDING_ANGLE

This advanced option controls how small an angle is allowable between adjacent legs in a rebar set bar.

20.2 Changed advanced options

XS_CNC_HOLE_DIAMETER_ROUNDING

Now the advanced option XS_CNC_HOLE_DIAMETER_ROUNDING also affects tapped holes in NC files.

XS_..._LONGHOLE_MARK_STRING_FOR_SIZE

The default values of `XS_SHOP_LONGHOLE_MARK_STRING_FOR_SIZE`, `XS_SITE_LONGHOLE_MARK_STRING_FOR_SIZE`, and `XS_LONGHOLE_MARK_STRING_FOR_SIZE` have been changed to use `LONGHOLE_MIN` and `LONGHOLE_MAX` instead of `LONG_HOLE_X` and `LONG_HOLE_Y`.

With this change, the shorter of the slotted hole dimensions is shown first in marks for slotted holes, and then the longer dimension.

XS_MACRO_DIRECTORY

Previously, it was only possible to specify a global folder and one local folder using the XS_MACRO_DIRECTORY advanced option. It is now possible to specify several local folders.

20.3 Removed advanced options

XS_CLASH_CHECK_BETWEEN_REFERENCES, XS_CLASH_CHECK_INSIDE_REFERENCE_MODELS, XS_CLASH_CHECK_BETWEEN_PARTS

The advanced options that controlled clash check content have been removed in Tekla Structures 2023. You now control the clash check content in the **Clash check manager** dialog box using the existing settings **Between parts**, **Between reference models**, and **Objects in reference models**.

When you open **Clash check manager** for the first time after starting Tekla Structures, or after you have opened a new model, the **Between parts** setting is now by default set to selected, and the **Between reference models** and **Objects in reference models** settings are set to not selected.

XS_REBAR_COMBINE_BENDINGS_IN_EVALUATOR, XS_REBAR_USE_POLYCURVES_IN_EVALUATOR

After the improvements in rebar shape recognition (page 45), these advanced option are no longer needed and they have been removed. Tekla Structures 2023 works the same way as the previous versions with these advanced options set to the default value `TRUE`.

21 Changes in template attributes

Tekla Structures 2023 introduces some new template attributes.

You can use template attributes in filtering and in drawing and report templates. When you open a drawing or create a report, Tekla Structures uses the attributes and formulas to calculate and display information from the model database. The template attributes that are available in a template row definition depend on the content type of the row.

21.1 New template attributes

- HOLE_TYPE
- HOLE_1_TYPE ... HOLE_5_TYPE
- PLAIN_HOLE_TYPE
- SPECIAL_HOLE_1_X ... SPECIAL_HOLE_5_X, SPECIAL_HOLE_1_Y ... SPECIAL_HOLE_5_Y
- PAGES

22 Tekla Structures 2023 fixlist

Tekla Structures 2023 includes all fixes released in Tekla Structures 2022 service packs up to SP7. These fixes are not included in Tekla Structures 2023 fixlist.

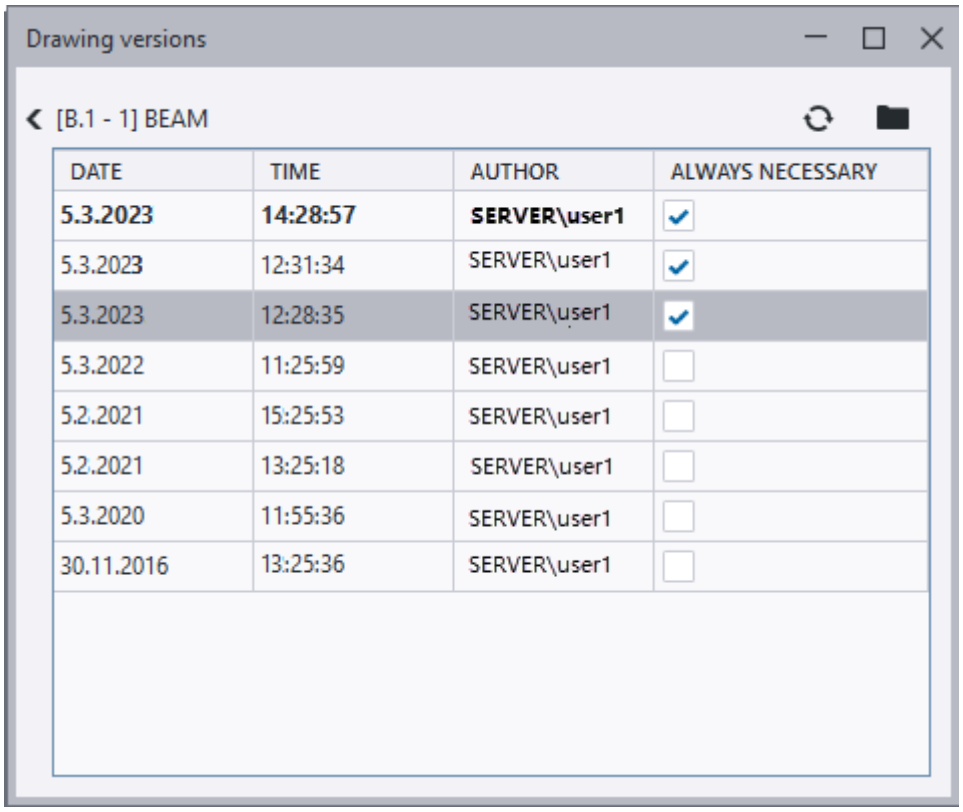
23 2023 SP1: Important improvements and fixes

The latest service pack and updated environment installers are available in Tekla Downloads.

23.1 Keep drawing versions

The **Drawing versions** feature now introduces an option to mark versions as **Always necessary**, which means that the version you select will be protected from the automatic removal of the old drawing versions. You can set the

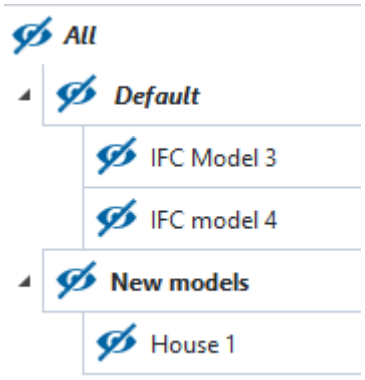
Always necessary option individually for each drawing version by selecting the corresponding check box in the **Drawing versions** dialog box.



TTSD-49247

23.2 Hide or show all reference models at one go

You can now hide or show all reference models in the Tekla Structures model at one go with the new **All** button.



TTSD-52486

23.3 Change in controlling pour unit visibility in Organizer

Tekla Structures 2022 introduced the **Pour units enabled** setting in **Organizer**, enabling you to control whether pour units or cast-in-place cast units are used as the highest cast-in-place hierarchy level in **Organizer**. The **Pour units enabled** setting is located on the **Synchronization** tab in **Organizer Settings**.

In Tekla Structures 2023 SP1, to use the **Pour units enabled** setting, you need to set the `XS_ENABLE_POUR_MANAGEMENT` advanced option to `TRUE`. Note that if the `XS_ENABLE_POUR_MANAGEMENT` advanced option is set to `FALSE`, the **Pour units enabled** setting is not shown in **Organizer**, and you cannot use pour units as the highest cast-in-place hierarchy level in **Organizer**.

Previously, the **Pour units enabled** setting was always available in **Organizer Settings**, regardless of the advanced option value.

TTSD-56158

23.4 Weld reference text can be used in custom components

You can now use weld reference text in custom components. Note that the weld reference text can be represented as a single line only.

TTSD-33758, TTSD-56526, TTSD-28282, TTSD-45866, TTSD-38478

23.5 New bar geometry options in reinforcement numbering

Tekla Structures 2023 SP1 comes with a new model-specific advanced option, `XS_REBAR_GEOMETRY_TYPE_IN_NUMBERING`, under **Numbering** in the **Advanced options** dialog box.

With this advanced option you can specify how the geometry of reinforcing bars is taken into account in numbering and which type of bar geometry is used when bars are compared with each other.

The options are:

- `POLYLINE`: The modeled, polyline geometry of bars is used in numbering. This is the default value.

  Using this option means that the numbering of bars is unchanged from previous Tekla Structures versions.

- `RATIONALIZED`: With the rationalized geometry, segmented arcs in bars are converted to true arcs in rebar shape recognition, and the true arcs are then used in numbering.
- `FABRICATION`: With the fabrication geometry, arcs in bars might be recognized as straight legs in rebar shape recognition. Bars that have the **Recognize as straight bar** UDA set to **Yes** are also recognized as straight.

With the `RATIONALIZED` or `FABRICATION` option, the simplified bar geometry is also used in cast unit numbering.

TTSD-55974, TTSD-50862, TTSD-56109

23.6 Layout manager now supports layout arcs

You can now import and export layout arcs in `.tflx` files in **Layout manager**. Imported arcs are shown in the model by using the **Layout arc** tool that is available in the **Applications & components** catalog.

TSAC-7047

24 Tekla Structures 2023 administrator's release notes

Upgrade guide from Tekla Structures 2022 to Tekla Structures 2023

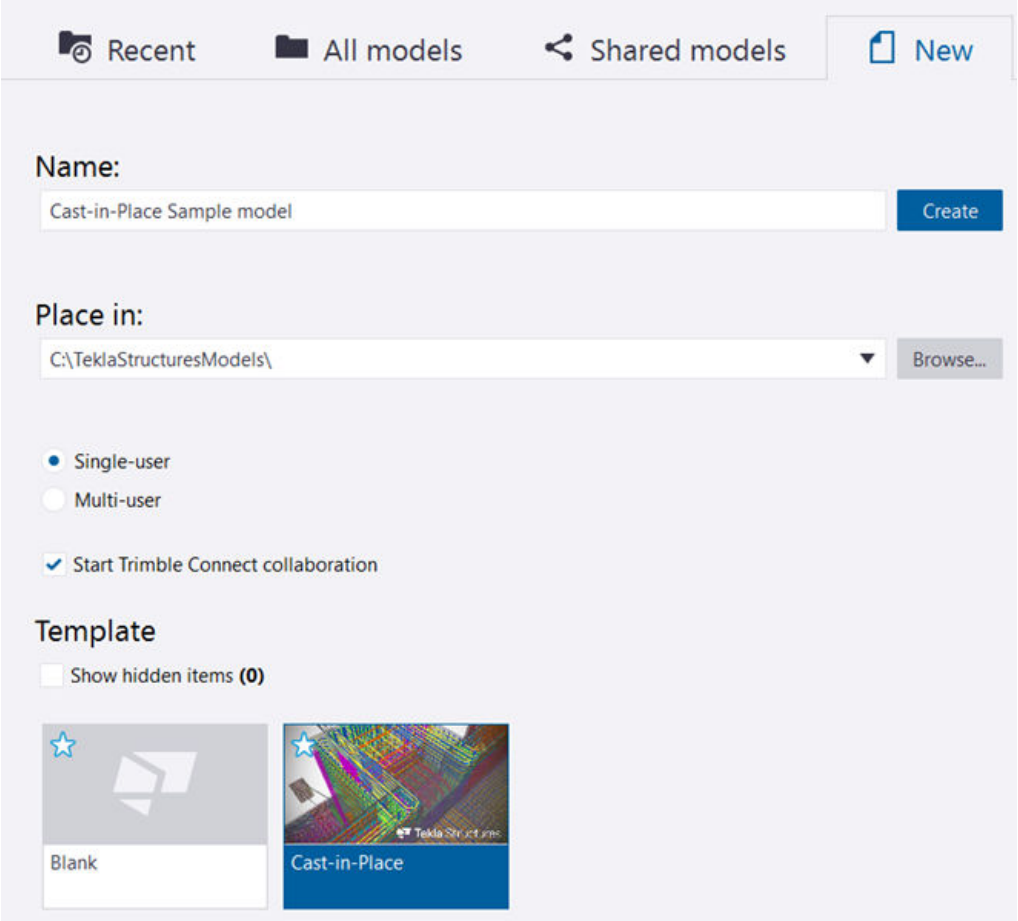
Administrator's release notes are intended to provide advanced users with instructions on how to apply the additional customizations available in a new Tekla Structures version.

24.1 Administrator's release notes: Model templates in version update

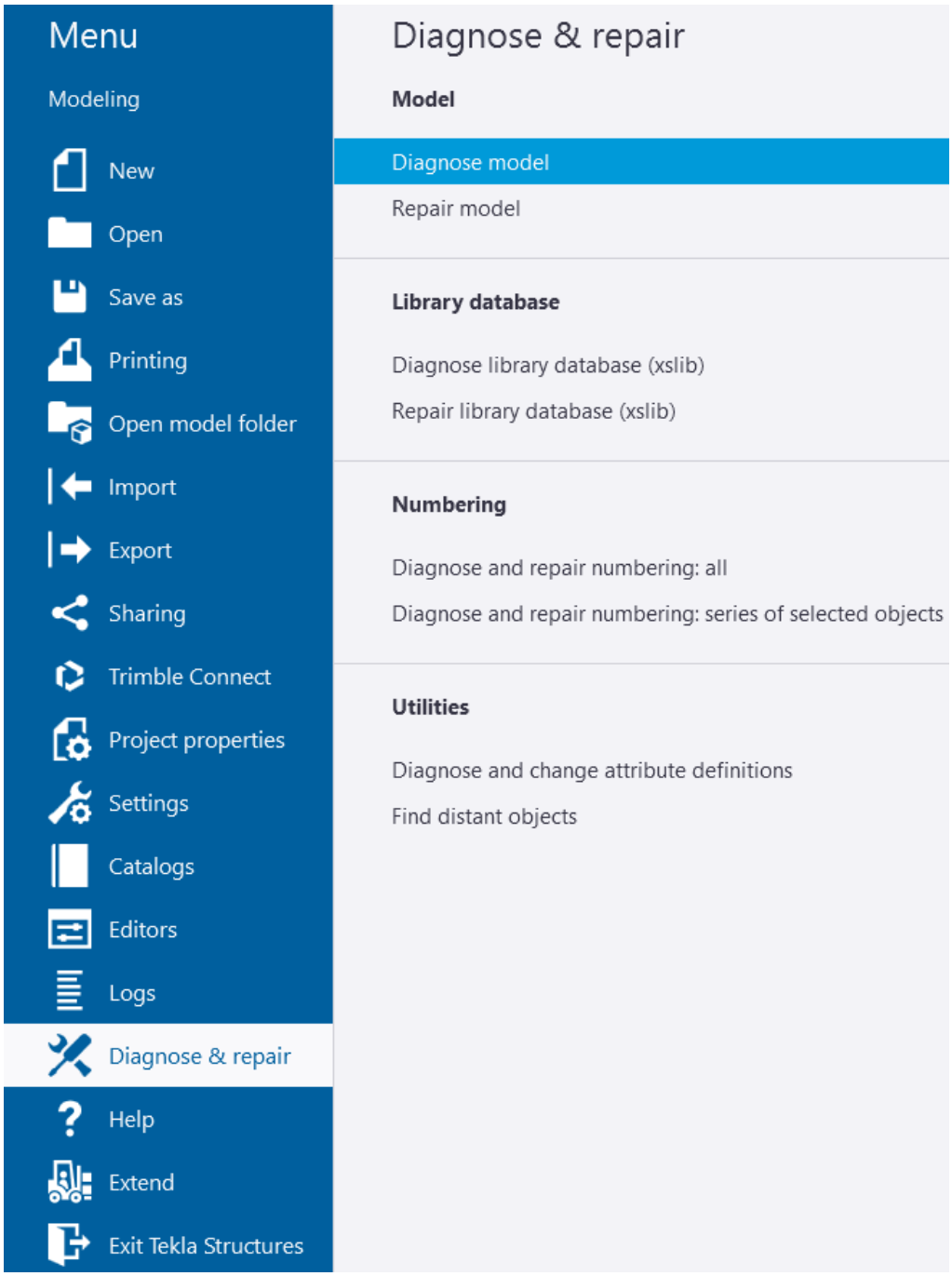
NOTE If you have model templates in Tekla Warehouse, remember to update them as well.

Update model templates

1. Open Tekla Structures 2023.
2. Create a new model using an existing model template.
3. Give the model the same name as in the previous Tekla Structures version.

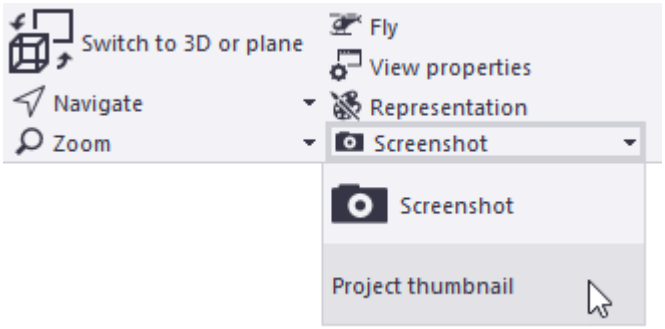


4. Open a 3D view.
5. Diagnose and repair the model.



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

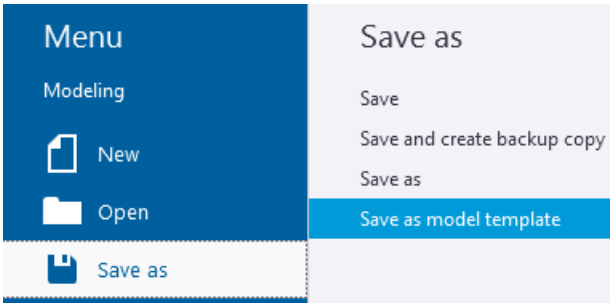
   The preferred size of the image is `120 x 74` pixels.



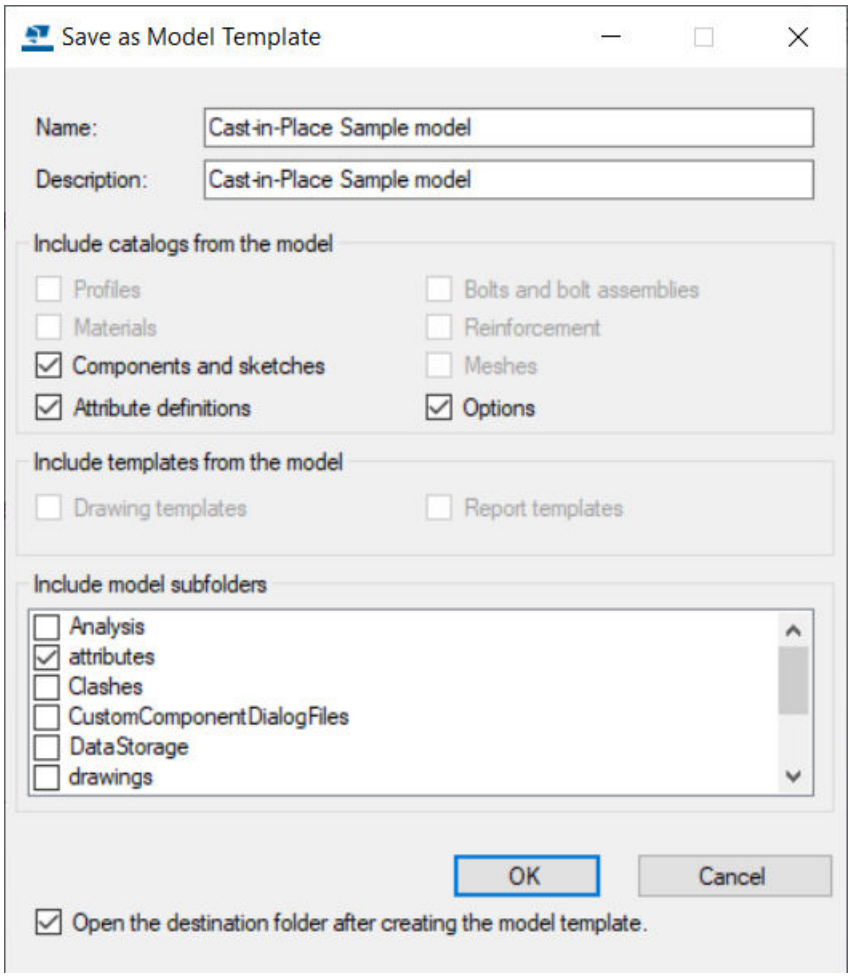
7. Save the model.

   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**.



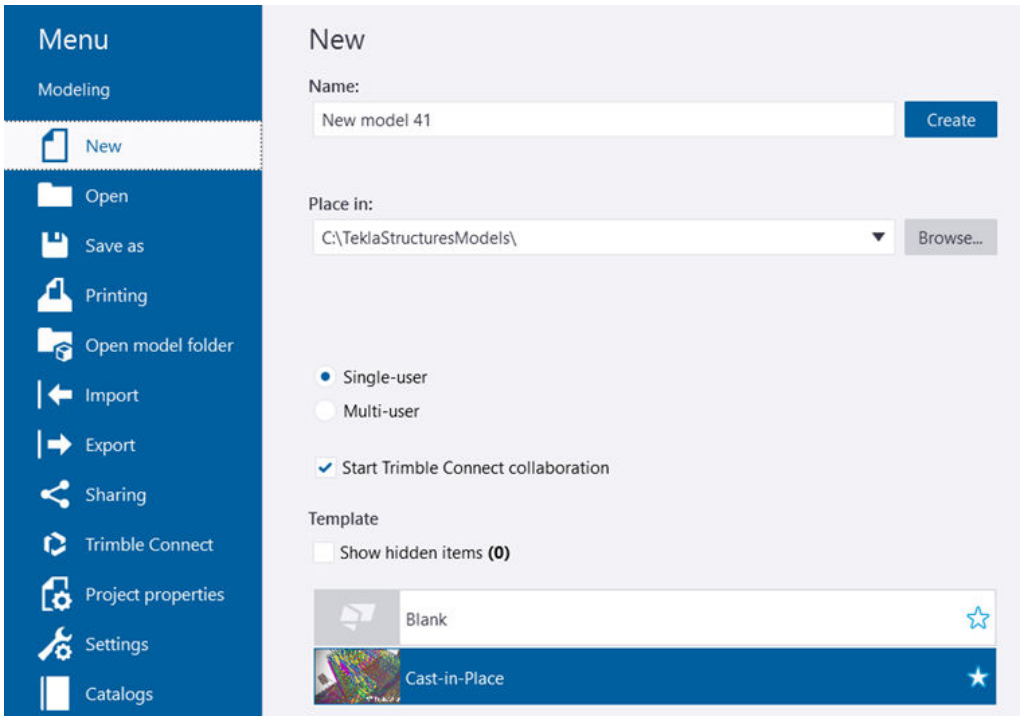
10. Manually remove all `*.db` files (environment database, options databases) from the model folder.

    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.



24.2 Administrator's release notes: Applications & components catalog maintenance

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

Set `XS_COMPONENT_CATALOG_ALLOW_SYSTEM_EDIT` to `TRUE` to be able to edit the **Applications & components** catalog definition files that are located in the `XS_SYSTEM` folders.

Check and fix the following:

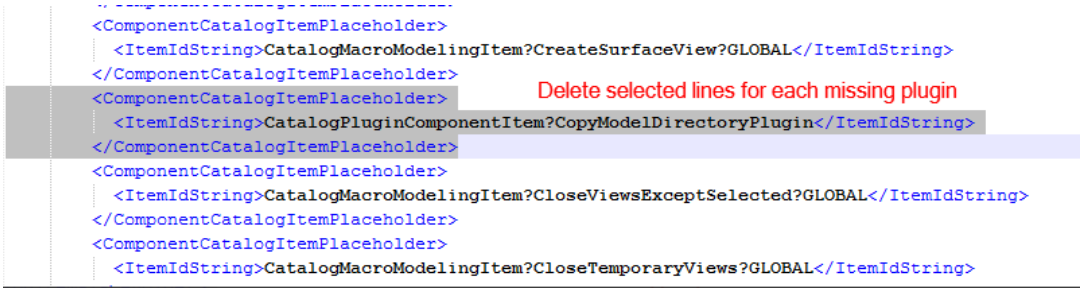
1. Add items to groups

Check the **Ungrouped items** group and add the items to the appropriate group.

2. 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.

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



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.

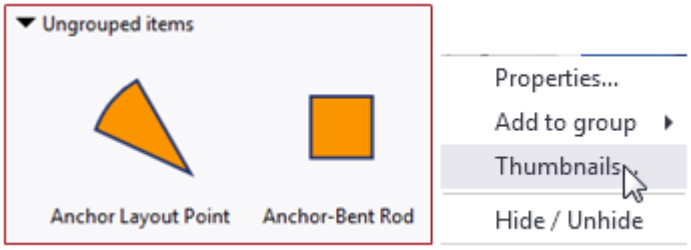
As in the example above, there might be errors for:

- `CatalogPluginComponentItem?CopyModelDirectoryPlugin`
- `CatalogPluginComponentItem?SaveAsModelTemplatePlugin`

3. Hide all non-related applications and components from roles

1. In the **Ungrouped items** catalog, select **Show hidden items** at the bottom.
2. Right-click an application or a component and select **Hide / Unhide**.

4. Create custom thumbnails



Publish a component 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.

24.3 Administrator's release notes: Property pane updates

In the new Tekla Structures version, there can be new object types or properties, changed object types or properties, or removed properties.

For more information about changes in the property pane, see Property pane improvements (page 30).

NOTE Previously, it was possible to customize the property pane in the common environment. In Tekla Structures version 2023, customizations in the common environment have been removed.

Automatic upgrade of property templates

Your own property pane settings in `PropertyTemplates.xml` are now automatically merged with the default set of properties offered by Tekla Structures.

When you upgrade to a new Tekla Structures version, the property pane automatically merges the latest changes in the default set of properties from the Tekla Structures database with your custom `PropertyTemplates.xml` files from the previous version in the environment, company, or project folder.

When the property pane settings are merged, settings that are loaded later override the previously loaded settings. The overriding is done separately for each object type. The loading order is:

1. Default property pane settings from the Tekla Structures database
2. Property pane settings in environment folders, based on the XS_SYSTEM path
3. Property pane settings in the company folder, defined in XS_FIRM
4. Property pane settings in the project folder, defined in XS_PROJECT
5. Your customized property pane settings under `%localappdata%`.

After you open the **Property pane editor** and save the customized layout in Tekla Structures version 2023, it is no longer necessary to manually update your own `PropertyTemplates.xml` files when you upgrade to later versions.

1. Open the **Property pane editor**.

   For detailed instructions, see Customize the property pane layout.
2. (Optional) Add your most important UDAs directly to the property pane so that you do not need to open separate UDA dialog boxes.
3. Click the **Save all** button.

   The customizations are saved in the `\<user>\AppData\Local\Trimble\TeklaStructures\<version>\UI\PropertyTemplates` folder.
4. Copy the `PropertyTemplates.xml` file from the `\<user>\AppData\Local\Trimble\TeklaStructures\<version>\UI`

`\PropertyTemplates` folder to the environment, company, or project folder.

For example: `..\ProgramData\Tekla Structures\<version>\Environments\<environment>\system\PropertyRepository\Templates\PropertyTemplates.xml`

Show or hide properties in the property pane

You can now customize the property pane to show only properties that you mark as frequently used.

By default, all properties are marked as frequently used and are always shown in the property pane. If you want to hide the properties that you do not use frequently, Customize the property pane layout, and mark each property as frequently or infrequently used.

For more information, see Show only frequently used properties in the property pane (page 30) in the Tekla Structures 2023 release notes.

Start using the new property pane for drawings

A new property pane in drawings makes drawing object properties accessible in a side pane window.

For more information about the improvement, see New property pane in drawings (page 9).

1. Ensure that the drawing property pane for each object type has at least one standard file.

   We recommend that you check the standard files for all roles. If there are any missing files, create the files and save them in the correct folders under the environment folder.

   For more information, see Standard property files.

2. Check the dimension attribute files for missing related exclude tag filters.

   If the dimension attribute file does not need an exclude tag filter, select **None** from the **Filter** list under **Excluded tags**, then save the attribute file.

   The file is saved in the `<model>\attributes` folder. Copy the file to correct folder.

   For more information about excluding tags, see Filter out dimension tag content.

3. (Optional) Customize the property pane layout, and mark each property as frequently or infrequently used.

If you have customized the ribbon, add changes to your customized ribbon. See Administrator's release notes: Ribbon updates (page 116).

24.4 Administrator's release notes: Ribbon updates

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.

Check the changes

Compare the original ribbon with the changes that you have made.

You can check the changes to see what has been added and removed, and what has been moved to different tabs.

Add changes to your customized ribbon

If you have customized the ribbon, update the ribbon to include the changes made in the new Tekla Structures version.

1. On the **Drawing** tab, remove all menu items except **View** and **Drawing** from the **Properties** menu.

24.5 Administrator's release notes: Changes in advanced options

In Tekla Structures version 2023, new advanced options have been added, and some existing advanced options have been changed or removed.

For more information about these changes, see Changes in advanced options (page 98) in the Tekla Structures 2023 release notes.

New advanced options for system internal

These new advanced options define folders for files that are used internally by Tekla Structures. Using these separate folders for the internal system and message files prevents the customized files in your environments from accidentally overriding the internal files.

- XS_MESSAGES_PATH_INTERNAL defines the location of the folder than contains `.ail` translation files that are used internally by Tekla Structures.
- XS_SYSTEM_INTERNAL defines the location of the read-only Tekla Structures system folder that contains standard, data (.dat), and property files that are used internally by Tekla Structures.

WARNING	Do not change the values of these advanced options.

24.6 Administrator's release notes: Special bolt holes

The ability to create slotted holes with an offset and tapped holes has been added, and other bolt hole improvements have been made in this version of the software.

For more information about these improvements, see Slotted holes with offsets, tapped holes, and other bolt hole improvements (page 36) in the Tekla Structures 2023 release notes.

Update your standard files if you want to use the new options and features.

Update reports and templates for new special hole attributes

It is now possible to use new properties for bolts or holes in reports and templates.

These new properties are available:

- SPECIAL_HOLE_1_X
- SPECIAL_HOLE_2_X
- SPECIAL_HOLE_3_X
- SPECIAL_HOLE_4_X
- SPECIAL_HOLE_5_X
- SPECIAL_HOLE_1_Y
- SPECIAL_HOLE_2_Y
- SPECIAL_HOLE_3_Y
- SPECIAL_HOLE_4_Y
- SPECIAL_HOLE_5_Y

If you want to use these new properties in reports, update your reports with the new properties.

24.7 Administrator's release notes: Reinforcement improvements

The new simplified bar geometry definition allows you to report, number and export rebars that are modeled with complex geometry in a simplified

manufacturable format. There are also changes related to leg surfaces and changes in the attachment of rebar set bars.

For more information about these improvements and changes, see Reinforcement improvements (page 45) in the Tekla Structures 2023 release notes.

Update the rebar catalog for changes in the Rebar shape manager

1. Open the `rebar_database.inp` file in a standard text editor.
2. Add the **Extra point shortening**, **Curve tolerance**, and **Max curve radius requiring bending** fields.
3. Save the `rebar_database.inp` file and copy it to the `profil` or `catalogs` folder for your environment.
4. If your model templates include the rebar catalog, update your model templates.

Add new shapes to the Rebar shape manager

If you do not use the default environment, add new shapes to the `RebarShapeRules.xml` file in your environment.

1. On the **File** menu, click **Editors** --> **Rebar shape manager**.
2. On the **Shape catalog** tab, add the shape for polycurve arc bar.
3. Add new shapes for any other polycurve shapes that have not been previously supported.

Add new options to the Rebar shape manager

In the **Rebar shape manager**, you can now use the template attributes `USAGE` and `USAGE_VALUE` as custom properties in bending shape rules.

- Add these options to the `RebarShapeManager.CustomProperties.dat` file or merge the file from the common environment with your customized `RebarShapeManager.CustomProperties.dat` file:

```
USAGE            String        TextValue
USAGE_VALUE      Integer       NumericValue
```

Update the `objects.inp` file for changes in shape recognition

If your environment does not use the `objects.inp` file in the `common/inp` folder, you must update your `objects.inp` file to make the new **Shape recognition** tab in UDAs for rebar visible.

1. In the environment folder, open the `objects.inp` file in a standard text editor.
2. Add the following lines to the "Reinforcing bar attributes" section:

```
tab_page("","albl_Shape_recognition",6)
  {
    attribute("RSR_EXT_POINT_SHORT", "albl_Extra_point_shortening",
float, "%d", no, none, "0.0", "0.0")
    {
        value("", 0)
    }
    attribute("RSR_CURVE_TOLERANCE", "j_d_j_tol_curve", float, "%d", no,
none, "0.0", "0.0")
    {
        value("", 0)
    }
    attribute("RSR_MAXCURVE", "albl_MAXCURVE", float, "%d", no, none,
"0.0", "0.0")
    {
        value("", 0)
    }
    attribute("RSR_FORCE_STRAIGHT", "albl_Force_straight", option, "%s",
no, none, "0.0", "0.0")
    {
        value("", 2)
        value("j_No", 0)
        value("j_Yes", 0)
    }
  }
```

3. Save the file.

Update advanced options for changes in shape recognition

If you do not want to use the default values for the new advanced options, update them in the `environment.ini` or `role.ini` file.

The default values are:

- XS_REBAR_RECOGNITION_EXTRA_POINT_SHORTENING: 0.3
- XS_REBAR_RECOGNITION_MAXCURVE: 304800
- XS_REBAR_RECOGNITION_CURVE_TOLERANCE: 12.7

1. Open the `environment.ini` or `role.ini` file in a standard text editor.
2. Change the values of the new advanced options.
3. Save the file.

Update your customized files for changes due to short leg and long leg suffixes for rebar sets

1. Copy the `objects_couplers.inp` from the common environment or merge the file from the common environment with your customized `objects_couplers.inp` file.
2. If your environment does not use the `common\inp` folder, add the `objects_couplersSL.inp` file to the folder defined by the XS_INP advanced option.
3. Modify the `RebarShapeManager.CustomProperties.dat` file to support both the existing start and end prefixes, and the new short leg and long leg prefixes, or merge the file from the common environment with your customized `RebarShapeManager.CustomProperties.dat`.

   Example contents of the modified file:

```
PREFIX              String      TextValue

ENDPREP_START       Integer     NumericValue
THREAD_TYPE_START   String      TextValue

ENDPREP_START       Integer     NumericValue
THREAD_TYPE_START   String      TextValue

//
// Short leg OR long leg specific custom properties
//
METHOD_S            Integer     NumericValue
TYPE_S              Integer     NumericValue
PRODUCT_S           String      TextValue
CODE_S              String      TextValue
ENDPREP_S           Integer     NumericValue
THREAD_TYPE_S       String      TextValue
THREAD_LENGTH_S     Double      DistanceValue
EXTRA_LENGTH_S      Double      DistanceValue
FREE_1_S            Double      DistanceValue
FREE_2_S            String      TextValue
//
METHOD_L            Integer     NumericValue
TYPE_L              Integer     NumericValue
PRODUCT_L           String      TextValue
CODE_L              String      TextValue
ENDPREP_L           Integer     NumericValue
THREAD_TYPE_L       String      TextValue
THREAD_LENGTH_L     Double      DistanceValue
EXTRA_LENGTH_L      Double      DistanceValue
FREE_1_L            Double      DistanceValue
FREE_2_L            String      TextValue
```

4. Modify the `RebarCoupler.Udas.dat` file to add **End preparations** to the **Coupler** and **End anchor** plug-in dialog boxes.
   a. Open the `RebarCoupler.Udas.dat` file in a standard text editor.
   b. Add the following line to the file:

```
REBAR   option      EndPrepLeft     EndPrepRight
ENDPREP_START           ENDPREP_END         j_d_j_End_preparation
```

c. Save the file.

5. If you do not use the standard files from the common environment, update these standard files:

   - `standard.RebarCoupler.CouplerForm.xml` standard file for the Rebar coupler tool
   - `standard.RebarCoupler.EndAnchorForm.xml` standard file for the Rebar end anchor tool.

   Add default values for **End preparation** on the **Rebar attributes** tab.

24.8 Administrator's release notes: NC DSTV improvements

The fully renewed DSTV to DXF converter makes it easy to convert DSTV NC files into DXF drawings to be used in fabrication production solutions, such as plate nesting or production management.

For more information about these improvements and changes, see NC DSTV improvements (page 76) in the Tekla Structures 2023 release notes.

Prepare your environment for the new DSTV to DXF converter

1. Create standard files and save them in the correct folders in your environment.
2. Check and update the groups in the **Applications & components** catalog.
3. (Optional) Copy the template from `common\macros\modeling` and modify it to meet your needs.
4. Set up and customize automation routines.

24.9 Administrator's release notes: Improved naming conventions and properties for objects imported from Tekla Structural Designer

You can now use a mapping file to define how object properties are mapped when you import objects from Tekla Structural Designer into Tekla Structures. You can also use the mapping file to translate the names of objects imported from Tekla Structural Designer from English into your local language.

You can use the mapping file to define how these properties are mapped when you import objects from Tekla Structural Designer:

- Name
- Part Number Prefix
- Part Number Start Number
- Assembly Number Prefix
- Assembly Number Start Number
- Part Group

These properties are only set for newly created objects. When previously created objects are updated, existing properties are not updated.

Create a mapping file for imports from Tekla Structural Designer

Using this improvement is optional, but if you import objects from Tekla Structural Designer, consider creating a mapping file to improve the import process.

1. Copy the example `TSDPropertyFileMapping.cnv` from the `..\environments\common\system` folder to your environment.
2. Open the `TSDPropertyFileMapping.cnv` in a standard text editor.
3. Customize the mapping file for your environment.

   Enter each mapping in this format:

```
TSD_Type, Material_Type, Fabrication = Property_File in Tekla Structures
```

   Example of a customized `TSDPropertyFileMapping.cnv` file:

```
! Structural Designer Property File Mapping. TSD -> Tekla Structures !
! TSD_Type, Material_Type, Fabrication = Property_File in Tekla Structures
# Concrete members
GENERAL_COLUMN, 3, 0 = Precast.ccl
GENERAL_COLUMN, 3, 1 = standard.ccl
GENERAL_BEAM, 3, 0 = Precast.cbm
GENERAl_BEAM, 3, 1 = beam.cbm
GROUNDBEAM, 3, 1 = Groundbeam.cbm
PILE, 3, = pile.ccl
# Steel members
GENERAL_COLUMN, 1, = Steel_Column.clm
GENERAL_BEAM, 1, = Steel_Beam.prt
BRACE, 1 = Steel_Brace.prt
# Slabs
RC_SLAB, 3, 1 = standard.csl
# Footings
STRIP_BASE, 3, = standard.csf
PADBASE, 3, = standard.cpf
PILE_CAP, 3, = Pile Cap.cpf
# Walls
MESHED, 3, 0 = Wall.cpn
```

```
MESHED, 3, 1 = Wall.cpn
BEARING_WALL, 3, 0 = standard.cpn
```

4. Save the file.

24.10 Administrator's release notes: Drawing DWG/DXF export improvements

The quality and usability of the existing DWG/DXF export has been improved and some new functionality has been added.

For more information about these improvements, see Drawing DWG/DXF export improvements (page 71) in the Tekla Structures 2023 release notes.

We recommend that you enable the new DWG/DXF export for drawings by default. Update your standard files to set the value of XS_USE_OLD_DRAWING_EXPORT to false:

```
XS_USE_OLD_DRAWING_EXPORT=FALSE
```

24.11 Administrator's release notes: IFC improvements

For more information about these improvements, see IFC improvements (page 68) in the Tekla Structures 2023 release notes.

Update your environment for new entity types

These new entity types have been added to the **Property Set Definitions** dialog box for IFC2x3 and IFC4 export: IFCBearing, IFCBridgePart, and IFCChimney.

If you are not using the `IfcPropertySetConfigurations.xsd` file from the common environment, add definitions for IFCBearing, IFCBridgePart, and IFCChimney to your custom `IfcPropertySetConfigurations.xsd` file.

Update your environment for the new option for base point export

The new **Base point export** setting allows you to select which system to use when you export to IFC4 and the location is based on a base point.

Update your standard files if you want to use the new setting.

24.12 Administrator's release notes: Miscellaneous general improvements

Report attribute to show the total number of pages

You can now use the formula GetValue("PAGES") in reports to show the total number of pages in the report.

No customization is necessary, but you might want to consider using the new PAGES attribute in report templates to show the total number of pages in the report.

Support for welds when uploading to Trimble Connect

Welds are now supported when uploading to Trimble Connect.

To start using this improvement, add this line to the `part.epr` file in your environment:

```
"weld": ["WELD_SIZE1", "WELD_SIZE2", "WELD_TYPE1", "WELD_TYPE2",
"LENGTH", "WELD_ASSEMBLYTYPE", "WELD_EDGE_AROUND",
"WELD_INTERMITTENT_TYPE"]
```

24.13 Administrator's release notes: Steel settings

The following customization settings only apply to the steel user group.

Administrator's release notes: Steel components

There are several improvements in steel components in Tekla Structures 2023.

Update your standard files if you want to use the new options and features.

For more information about these improvements, see Improvements in components (page 84) in the Tekla Structures 2023 release notes.

24.14 Administrator's release notes: Concrete settings

The following customization settings only apply to the concrete user group.

Administrator's release notes: Concrete components

There are several improvements in concrete components in Tekla Structures 2023.

Update your standard files if you want to use the new options and features.

For more information about these improvements, see Improvements in components (page 84) in the Tekla Structures 2023 release notes.

25 Localization release notes

Environment-specific Tekla Structures localization release notes introduce new and changed features in the new Tekla Structures version from the localization point of view. It lists the features that have been localized in your environment and also helps you in your own customization tasks. The localization release notes are supplied by the localization teams at your local area and reseller offices.

26 Disclaimer

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