



# Tekla Structures

## Advanced Modeling Guide



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# 1 Pour management

With the pour management functionality of Tekla Structures, you can view the geometry of cast-in-place concrete structures, show them as parts or as pour objects, plan pours and pour breaks, and report pour information, such as concrete volumes and formwork areas. You can define pours, pour objects, and pour breaks for concrete parts whose cast unit type is **Cast in place**.

In Tekla Structures, a *pour object* is a building object that consists of one or more cast-in-place concrete parts. The cast-in-place concrete parts are merged into one pour object if they have the same material grade and they touch each other. They also need be in the same *pour phase* to be merged. Pour objects are visible in *pour views*.

A *pour* is a group of pour objects that is poured at one go.

With a *pour break* you can split a pour object into smaller pour objects.



The pour management functionality is mainly targeted at contractors for quantity take-off, planning, and on-site activities. By default, the pour management functionality is enabled only in the **Contractor** role. If you are using another role, you must enable the functionality by setting the advanced option `XS_ENABLE_POUR_MANAGEMENT` to `TRUE` in **Tools --> Advanced Options --> Concrete Detailing**.

- See also**
- [Enabling the pour functionality on page 10](#)
  - [Showing concrete structures as continuous on page 11](#)
  - [Defining the pour phase of a part on page 12](#)
  - [Pour objects on page 13](#)
  - [Pour breaks on page 18](#)
  - [Viewing pour errors in a log file on page 25](#)
  - [Troubleshooting pour errors on page 24](#)
  - [Example: Creating concrete geometry and working with pours on page 27](#)

## 1.1 Enabling the pour functionality

By default, the pour functionality is enabled only in the **Contractor** role. If you are using another role, you must enable the functionality in the **Advanced Options** dialog box.

To enable the pour functionality:

1. Click **Tools** --> **Options** --> **Advanced Options...** to open the **Advanced Options** dialog box.
2. Under **Concrete Detailing**, set `XS_ENABLE_POUR_MANAGEMENT` to `TRUE`.
3. Click **OK**.
4. Restart Tekla Structures for the change to take effect.

See also [Disabling the pour functionality in a certain model on page 10](#)

`XS_ENABLE_POUR_MANAGEMENT`

### Disabling the pour functionality in a certain model

You can temporarily disable the pour functionality. This can be useful if you do not need to work with pour objects, create pour breaks, or define pours at this stage. This can be useful also if the pour functionality seems to significantly slow down your model. Note that while the pour functionality is disabled, any information related to pours will be outdated and inaccurate, for example, in reports, and the pour breaks will not be adaptive. They will be updated automatically when you re-enable the pour functionality.

To disable or re-enable the pour functionality:

- Click **Tools** --> **Options** --> **Pours and Pour Breaks**.

A check mark indicates that the pour functionality is active.



If you are working in the multi-user mode, remember to re-enable the pour functionality before you save the model. In this way, information related to pours stays up to date for all users of the model.



If you have problems opening a large model with pour objects that contain many parts, you may need to disable the pour functionality before you open the model. You can do this by modifying the `xs_user.[user name]` file located in the model folder. Set `PAPB` to 0 to disable pours, and then save the file.

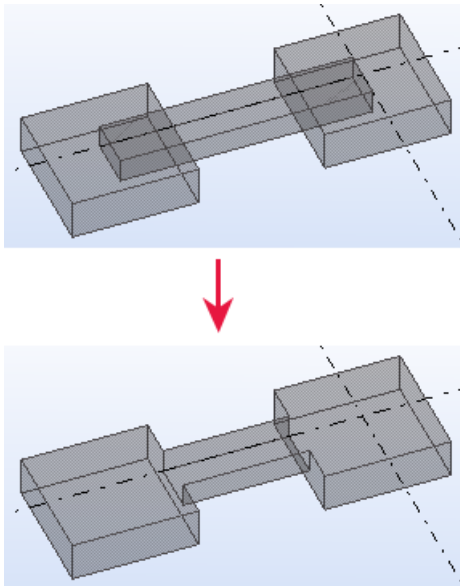
When needed, remember to re-enable the pour functionality.

---

See also [Enabling the pour functionality on page 10](#)

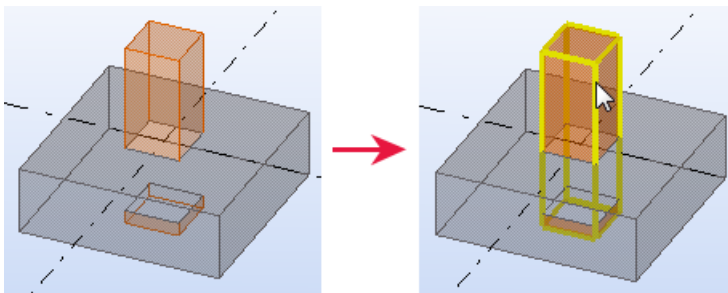
## 1.2 Showing concrete structures as continuous

When the pour functionality is enabled, Tekla Structures shows concrete parts as merged in the model if their cast unit type is **Cast in place**, if they have the same material grade and pour phase number, and if they touch or overlap one another. When these criteria are met, Tekla Structures automatically removes the outlines of the individual parts within each continuous concrete structure.



You can view cast-in-place concrete structures in model views either as parts or as pour objects. You can switch between part viewing and pour viewing by using the **Pour representation** switch on the **Pour Tools** toolbar or the **Cast in place** part representation setting in the **Display** dialog box.

Continuous concrete structures cannot be selected or highlighted in part views. When you hold the mouse pointer over a concrete structure in a part view, Tekla Structures highlights the original parts belonging to it. You can select a part and modify it if needed:



Duplicates and overlapping parts are counted only once in the volume calculations for pour objects. Note that single part and cast-unit volumes are still calculated the same way as

before, which means that the sum of single part and cast-unit volumes may be higher than the volume of pour objects that are defined from exactly the same part geometry.

When you reinforce a concrete structure, you need to reinforce the individual concrete parts within it in part views, or you can reinforce pour objects by using **Reinforcing Bar Shape Catalog** in pour views. The reinforcement geometry follows each part's geometry, not the continuous concrete geometry. Therefore, you can reinforce a part of a continuous concrete structure independently from the whole continuous concrete structure. All reinforcement are visible both in part views and in pour views.

**See also** [Enabling the pour functionality on page 10](#)

[Viewing pour objects on page 14](#)

Reinforcing pour objects using Shape Catalog

## 1.3 Defining the pour phase of a part

Use the pour phase property to separate pour objects from one another. By defining pour phases, you can prevent cast-in-place concrete parts from merging even if they have the same material grade and they touch or overlap one another.



Pay attention to pour phases when you create cast-in-place concrete parts. For example, use pour phase 0 for horizontal structures, like beams and slabs, and pour phase 1 for vertical structures, like columns and walls, to separate them to different pour objects. In this way you can make sure that the number of parts included in each single pour object is reasonable, and that your models do not slow down due to too large pour objects.

To modify the pour phase of a part:

1. Double-click a concrete part to open the part properties dialog box.
2. On the **Cast unit** tab, ensure that the cast unit type is set to **Cast in place**.
3. Enter a pour phase in the **Pour phase** box.

By default, the value is 0. If you are unable to change the value, the cast unit type that you set in step 2 is incorrect.

4. Click **Modify**.



When you define pour phases, make sure that parts in different pour phases do not overlap. As overlapping volumes of different pour phases are not merged, they are counted twice in calculations, and you may end up with incorrect volume, area, or weight information.

**See also** [Showing concrete structures as continuous on page 11](#)

## 1.4 Pour objects

Each concrete part whose cast unit type is **Cast in place** automatically forms a pour object.

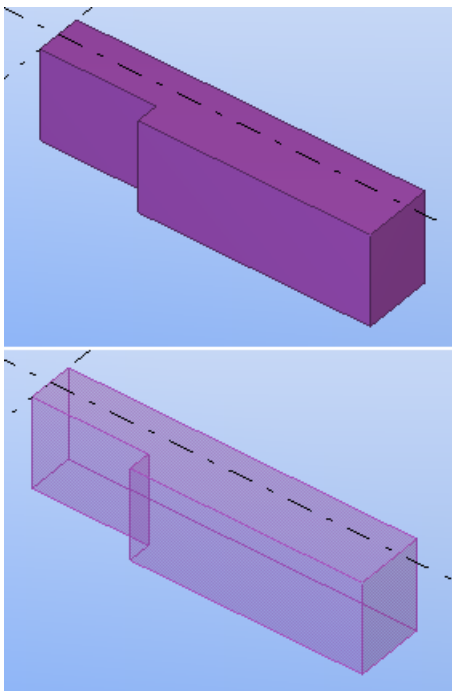
Tekla Structures automatically merges multiple cast-in-place concrete parts to a pour object if they have the same material grade and pour phase number, and if they touch or overlap one another.

By creating pour breaks you can split pour objects into smaller pour objects.



Make sure that the number of parts included in each single pour object is reasonable. Too large number of parts and part surfaces in a pour object slows down the model.

Pour objects are visible in pour views. All pour objects are displayed in the same color, regardless of the individual parts' color within a concrete structure. The default color is pink, but you can change it by using the advanced option `XS_POUR_OBJECT_COLOR` in **Tools --> Options --> Advanced Options... --> Concrete Detailing**.



You can also use different color and transparency settings in **View --> Representation --> Object Representation** to show pour object groups, for example, by pour number.



You can group pour objects using **Organizer** or **Task Manager**.

**Limitations** The following commands are not available for pour objects: **Copy**, **Move**, **Delete**, **Split**, and **Combine**. This is because pour object geometry is defined by parts. If you want to change the geometry of pour objects, you have to modify the parts instead of pour objects, or you can create pour breaks.


- See also** [Viewing pour objects on page 14](#)  
[Changing the color and transparency of pour objects on page 15](#)  
[Modifying the properties of a pour object on page 16](#)  
[About the pour type property on page 16](#)  
Reinforcing pour objects using Shape Catalog  
XS\_POUR\_OBJECT\_COLOR

**Viewing pour objects**

You can view pour objects in model views that are set to show cast-in-place concrete structures as pour objects instead of parts.

Before you start, ensure that the pour management functionality is enabled.

To view pour objects in a model view, do one of the following:

To	Do this
Show the pour objects using the <b>Display</b> dialog box	<div><div>1. Double-click the view to open the <b>View Properties</b> dialog box.</div><div>2. Click <b>Display</b> to open the <b>Display</b> dialog box.</div><div>3. Select <b>Pours</b> from the <b>Cast in place</b> list.</div><div><div>Parts<input checked="" type="checkbox"/></div><div><input checked="" type="checkbox"/> Exact</div><div><b>Cast in place</b> <b>Pours</b></div></div><div>4. Click <b>Modify</b>.</div></div>
Show the pour objects using the <b>Pour representation</b> switch	<div>Click the <b>Pour representation</b> switch  on the <b>Pour Tools</b> toolbar.</div> <div>The switch changes the representation of the active view from <b>Parts</b> to <b>Pours</b>, and the other way round.</div>



You can also create two views, a pour view and a part view, and keep them both open side by side on your screen.

- See also** [Enabling the pour functionality on page 10](#)  
[Pour objects on page 13](#)

[Changing the color and transparency of pour objects on page 15](#)

[Showing concrete structures as continuous on page 11](#)

## Changing the color and transparency of pour objects

By default, all pour objects are displayed in pink in pour views, regardless of the individual parts' color. You can customize the pour object color and transparency by defining object groups and then selecting specific color and transparency settings for each group.



To change the default color of pour objects, use the advanced option `XS_POUR_OBJECT_COLOR` in **Tools --> Options --> Advanced Options... --> Concrete Detailing**.



Customized colors are not preserved when you export pour objects. In the exported model, all pour objects are displayed in pink.

---

To change the color and transparency of pour objects in model views:

1. Click **View --> Representation --> Object Representation...** .  
The **Object Representation** dialog box is displayed.
2. Create a new object group for the pour objects whose color and transparency you wish to change.
  - a. In the **Object Representation** dialog box, click **Object group....**
  - b. In the **Object Group – Representation** dialog box, click **Add row**.
  - c. To direct the settings to pour objects instead of parts, select the following options for the row:
    - **Category = Object**
    - **Property = Object type**
    - **Condition = Equals**
    - **Value = Pour object**
  - d. If needed, add any additional filtering criteria.  
For example, to filter pour objects by a certain user-defined attribute, add a row with **Pour object** as **Category**, and define the **Property**, **Condition**, and **Value** as desired.
  - e. Enter a unique name in the box next to the **Save as** button.
  - f. Click **Save as** to save the object group.
  - g. Click **Close**.
3. Repeat step 2 if you wish to create more object groups.

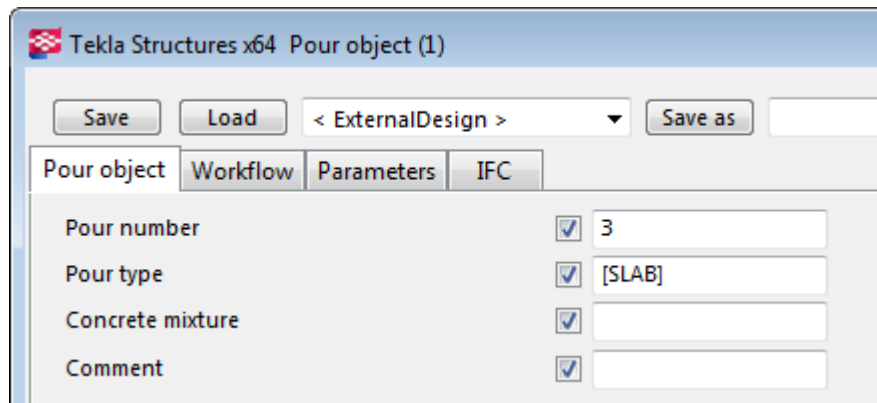
4. In the **Object Representation** dialog box, select an object group from the **Object group** list.
5. In the **Color** list, choose a color for the object group.
6. In the **Transparency** list, set the transparency of the object group.
7. Click **Modify**.

The object group's color and transparency changes in the model.


## Modifying the properties of a pour object

Pour objects have properties (user-defined attributes) which you can view, define, and modify.

For example, you can enter a **Pour number** that groups pour objects to a pour, or a **Pour type** that you can use to describe each pour object.



To modify the properties of a pour object:

1. Ensure that you are using a pour view. If not, click the **Pour representation** switch  to show the pour objects.
- By default, the pour objects are shown in pink.
2. Double-click the pour object whose properties you want to modify.
  3. In the **Pour object** dialog box, enter or modify the pour object properties.
  4. Click **Modify**.

See also [About the pour type property on page 16](#)

[Pour objects on page 13](#)



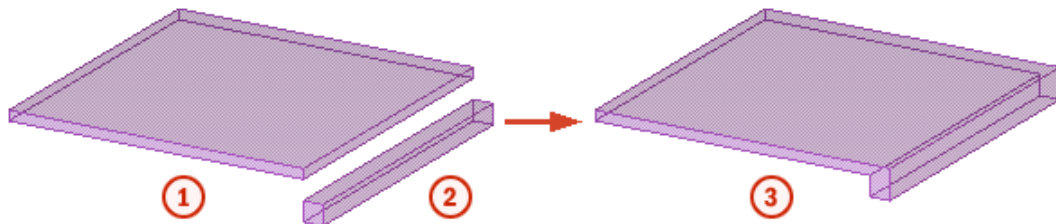
## About the pour type property

You can use the **Pour type** property to describe pour objects.

When you create or copy a cast-in-place concrete part, Tekla Structures automatically creates a pour object of it. By default, Tekla Structures uses the part name as the **Pour type** property of the pour object. The default pour type is enclosed in square brackets [ ] and it will be automatically updated if you change the part name. If you modify the pour type, the brackets are automatically removed, the modified pour type you enter replaces the default value, and the pour type no longer automatically changes by the part name.

### Merging pour objects

When pour objects with default pour types in square brackets [ ] are merged to a larger pour object, the default pour type of the new pour object is the name of the part with the largest volume in the new pour object.

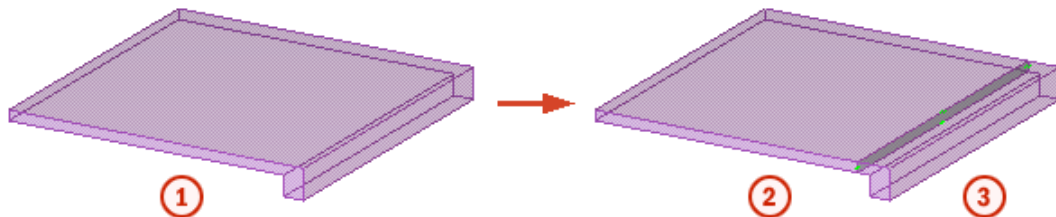


1. **Pour type** = [SLAB]
2. **Pour type** = [BEAM]
3. **Pour type** = [SLAB]

### Splitting pour objects with pour breaks

When you create a pour break and split a pour object into smaller pour objects, the smaller pour objects inherit their properties from the original pour object.

When a pour object with the default pour type in square brackets [ ] is split, each new pour object also receives a default pour type by the part name, that is, the name of the part with the largest volume in the new pour object.



1. **Pour type** = [SLAB]
2. **Pour type** = [SLAB]
3. **Pour type** = [BEAM]

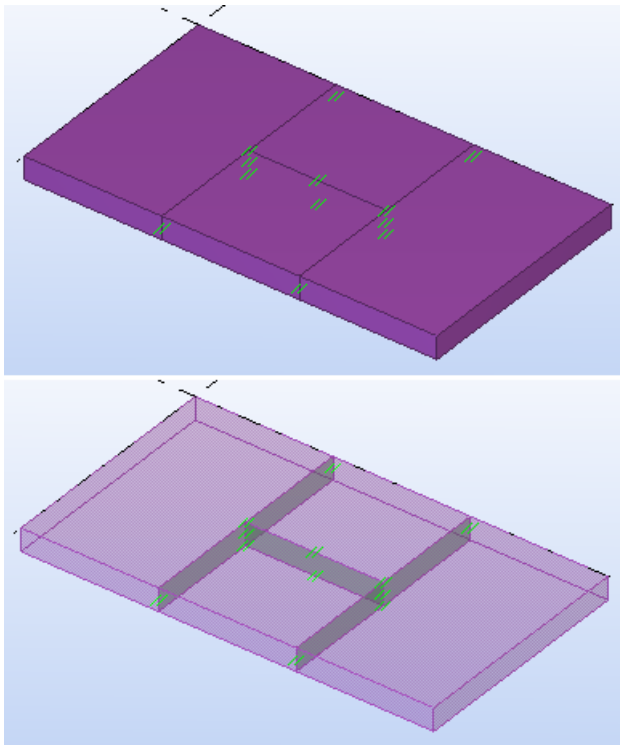
If you have modified the pour type of the original pour object and the pour type is no longer in square brackets [ ], the modified pour type value is used also for the new pour objects.

See also [Modifying the properties of a pour object on page 16](#)  
[Pour objects on page 13](#)

## 1.5 Pour breaks

Use pour breaks to split pour objects into smaller pieces.

Pour breaks are visible and you can work with them both in pour views and in part views. Pour breaks are displayed as a thin plane or line, depending on the part representation setting.



Pour breaks do not follow the part. If you move the part, the pour break remains at the original location.

If a pour break does not split a pour object completely into two, the pour break is displayed in red by default. This means that it is invalid and needs to be remodeled.

**See also** [Pour break adaptivity on page 19](#)  
[Setting the visibility of pour breaks on page 19](#)  
[Creating a pour break on page 20](#)  
[Selecting a pour break on page 21](#)  
[Copying a pour break on page 21](#)  
[Moving a pour break on page 22](#)  
[Modifying a pour break on page 22](#)

## Pour break adaptivity

Pour breaks are adaptive to changes in cast-in-place concrete parts and pour objects. This means that if you change the geometry or location of a cast-in-place concrete part or pour object, its pour breaks change accordingly.

If you delete a cast-in-place concrete part, its pour breaks disappear as well.

If you modify a cast-in-place concrete structure in any of the following ways, its pour breaks adapt:

- Change the profile or dimensions of a part
- Add or remove cuts or fittings
- Change chamfer shape or dimensions
- Add or remove parts of the cast-in-place concrete structure by:
  - Changing the cast unit type of a part from **Precast** to **Cast in place** or vice versa
  - Changing the pour phase of a part
  - Changing the concrete grade of a part
  - Moving, copying, or deleting parts

If you move a cast-in-place concrete part outside its pour breaks, the pour breaks disappear.

If you move a part so that it still hits one or more pour breaks, the pour breaks that are inside the part stay in their original locations and adapt to the part in the new location.

If you copy or move a pour break and it hits a cast-in-place concrete part in the destination location, the pour break adapts to the part.

If a pour break is dependent on another pour break that is split or deleted, the dependent pour break is deleted as well. If a pour break is dependent on another pour break that is moved, the dependent pour break adapts inside the pour object, as long as the pour break plane can touch the moved pour break.

## Setting the visibility of pour breaks

Before you start, ensure that the pour management functionality is enabled.

To set the pour breaks visible in a model view:

1. Double-click the view to open the **View Properties** dialog box.
2. Click **Display...** to open the **Display** dialog box.
3. Select the **Pour break** check box.
4. Click **Modify**.

See also [Enabling the pour functionality on page 10](#)

[Pour breaks on page 18](#)


## Creating a pour break


You can add pour breaks to pour objects or concrete parts whose cast unit type is **Cast in place**.

You can create pour breaks by picking one, two, or more points in the model.




When you create a pour break that traverses more than two points, the pour break will be limited to the pour object it splits and perpendicular to the current work plane. If you need to create an inclined or horizontal pour break using multiple points, shift the work plane first.











Use the **Snap to nearest points** snap switch  to start or end pour breaks on part or pour object edges.

Use the **Snap to any position** snap switch  to pick intermediate points for pour breaks.

To create a pour break, do any of the following:


To	Do this
Create a pour break, perpendicular to a part face, using one point	<ol style="list-style-type: none"><li>1. Click <b>Modeling --&gt; Create Pour Break --&gt; Using One Point</b> or .</li><li>2. Pick the location for the pour break.</li></ol>
Create a pour break that splits all cast-in-place concrete parts and pour objects located between two points	<ol style="list-style-type: none"><li>1. Click <b>Modeling --&gt; Create Pour Break --&gt; Using Two Points</b> or .</li><li>2. Pick two points to define the location of the pour break.</li></ol>
Create a pour break using multiple points	<ol style="list-style-type: none"><li>1. If needed, shift the work plane.</li><li>2. Click <b>Modeling --&gt; Create Pour Break --&gt; Using Multiple Points</b> or .</li><li>3. Pick the points you want the pour break to go through.</li></ol>
Create a pour break defined by the opposite corners of a rectangle	<ol style="list-style-type: none"><li>1. If needed, shift the work plane.</li></ol>

To	Do this
	<ol style="list-style-type: none"> <li>Click <b>Modeling --&gt; Create Pour Break</b>  --&gt; <b>Using Multiple Points</b> or , and then .</li> <li>Pick two opposite corner points of the pour break.</li> </ol>
Create a pour break defined by the center and one corner of a rectangle	<ol style="list-style-type: none"> <li>If needed, shift the work plane.</li> <li>Click  and then .</li> <li>Pick the center point of the pour break.</li> <li>Pick one corner point of the pour break.</li> </ol>
Create a pour break defined by three corners of a rectangle	<ol style="list-style-type: none"> <li>If needed, shift the work plane.</li> <li>Click  and then .</li> <li>Pick three corner points of the pour break.</li> </ol>
Create a pour break defined by one side midpoint and two corners of a rectangle	<ol style="list-style-type: none"> <li>If needed, shift the work plane.</li> <li>Click  and then .</li> <li>Pick one side midpoint of the pour break.</li> <li>Pick two corner points of the pour break.</li> </ol>

See also [Selecting a pour break on page 21](#)  
[Copying a pour break on page 21](#)  
[Moving a pour break on page 22](#)  
[Modifying a pour break on page 22](#)

## Selecting a pour break


To select a pour break:

- Ensure that the **Select pour breaks** selection switch  is active.
- Select the pour break.

See also [Pour breaks on page 18](#)

## Copying a pour break

To copy a pour break:


1. Ensure that the **Select pour breaks** selection switch  is active.
2. Select the pour break.
3. Copy the pour break like any other object in Tekla Structures.  
For example, right-click and select **Copy**.

See also [Pour breaks on page 18](#)

## Moving a pour break

You can move existing pour breaks. This may be needed, for example, if you have moved the part, because the pour break does not follow the part.

To move a pour break:



1. Ensure that the **Select pour breaks** selection switch  is active.
2. Select the pour break.
3. Move the pour break like any other object in Tekla Structures.  
For example, right-click and select **Move**.

See also [Pour breaks on page 18](#)  
[Modifying a pour break on page 22](#)

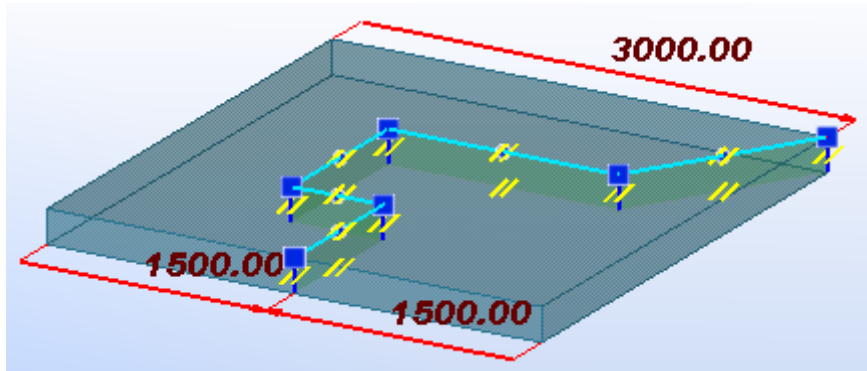
## Modifying a pour break

You can modify existing pour breaks.

Before you start:


- Ensure that the **Direct modification** switch  is active.
- Ensure that the **Select pour breaks** selection switch  is active.
- Select the pour break.

Tekla Structures displays the handles and dimensions that you can use to modify the pour break.



When you drag a handle, hold down the **Shift** key to use the snap switches. By default, the snap switches are off to make it easier to drag the handle to any location.


To modify a pour break:

To	Do this
Change the shape or location of the pour break	Drag a corner point or an end point to a new location.
Change a location dimension	<p>Drag a dimension arrowhead to a new location, or:</p> <ol style="list-style-type: none"> <li>1. Select the dimension arrowhead which you want to move.</li> <li>2. Using the keyboard, enter the value with which you want the dimension to change.  To start with the negative sign (-), use the numeric keypad.  To enter an absolute value for the dimension, first enter \$, then the value.</li> <li>3. Press <b>Enter</b>, or click <b>OK</b> in the <b>Enter a Numeric Location</b> dialog box.</li> </ol>
Add an intermediate point to the pour break	Drag a midpoint handle  to a new location.
Remove an intermediate point from the pour break	<ol style="list-style-type: none"> <li>1. Select an intermediate corner point.</li> <li>2. Press <b>Delete</b>.</li> </ol>

See also [Pour breaks on page 18](#)

## Removing a pour break

To remove a pour break:

1. Ensure that the **Select pour breaks** selection switch  is active.
2. Select the pour break.
3. Press **Delete**.

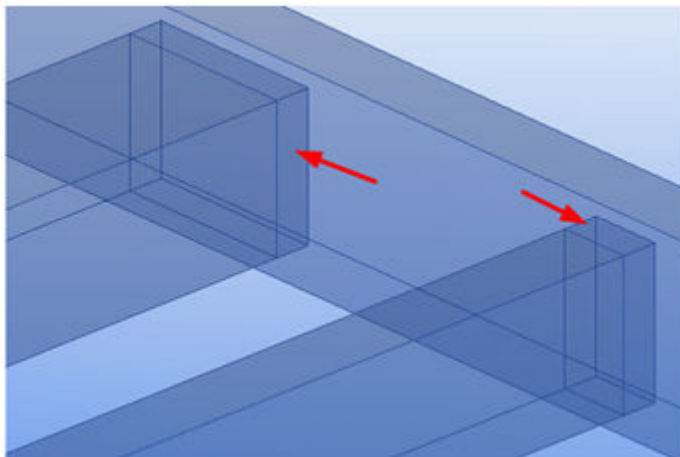
See also [Pour breaks on page 18](#)

## 1.6 Troubleshooting pour errors

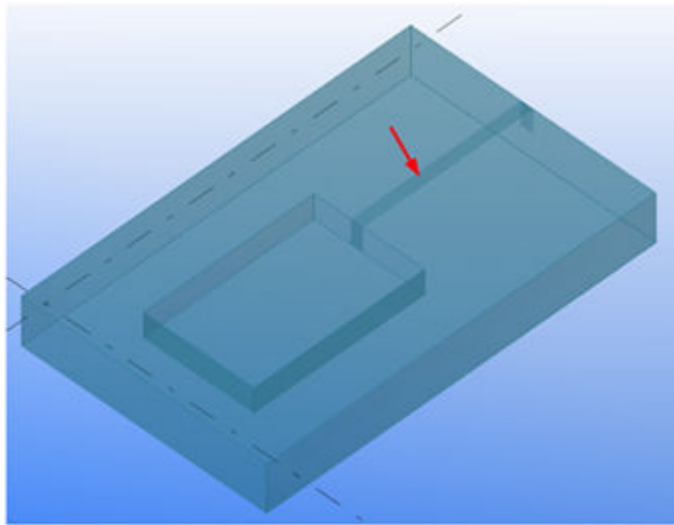
When you work with cast-in-place concrete parts, it is important that you regularly check the resulting pour objects, and try to get rid of the errors related to them, before you start detailing, or creating drawings and reports. The errors in solid pour objects may lead to inaccuracies in volume and other quantity calculations, and to incorrect representation in drawings.

While you model, use the following methods to check the model for pour-related errors:

- Check if there are `Solid error` rows in the session history log file.
- Ensure that the cast-in-place concrete parts and pour objects look continuous in model views. They should not have part outlines or shadow lines inside them, like in the following images:







If you notice errors or overlapping volumes or faces, try remodeling some of the parts.

You can also try out the following tips to avoid pour-related errors:

- Make sure that the number of parts included in a single pour object is reasonable.
- Sometimes modeling the parts in a different order may fix errors in pour objects.
- To control which lines are visible in drawings, use the advanced options `XS_DRAW_CAST_PHASE_INTERNAL_LINES` and `XS_DRAW_CAST_UNIT_INTERNAL_LINES`.

This may help because the cast-in-place concrete parts that have errors are treated in the same way in drawings as the precast concrete parts.

If remodeling the parts does not fix errors in solid pour objects, then overlap the parts as little as possible to ensure that the volume and quantity calculations are close to the correct values.

**See also** [Viewing pour errors in a log file on page 25](#)

[Example: Identifying and fixing a pour error on page 26](#)

[Pour management on page 9](#)

## Viewing pour errors in a log file

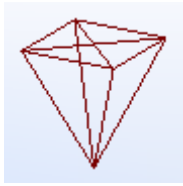
You can view pour-related errors in a log file. This may be needed, for example, if overlapping volumes and faces occur for parts and pour objects, and you need to analyze the error.

To view pour errors:

1. Click **Tools --> Display Log File --> Session History**.
2. Look for rows that start with the phrase `Solid error`.

3. Click the corresponding `Solid failure position` row to show the solid object error.

A diamond-shaped position locator is displayed in the model to point you to the error.



When you click a `Solid error` row in the log file, hold down the `z` key to center the view to the error location.

4. Redraw the view to hide the position locator.

**See also** [Troubleshooting pour errors on page 24](#)

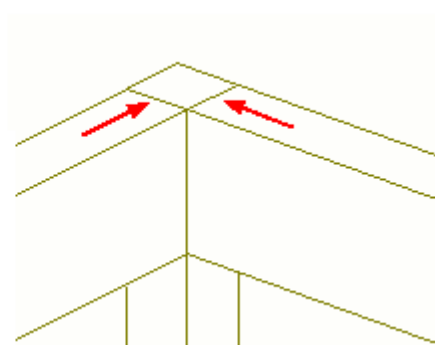
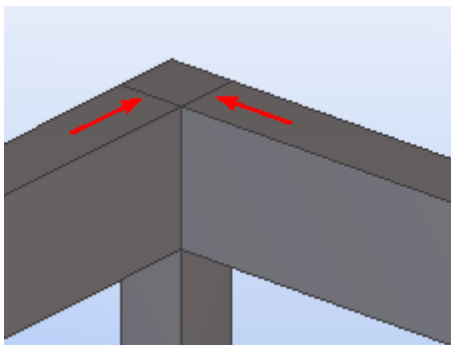
[Example: Identifying and fixing a pour error on page 26](#)

Useful shortcuts in viewing logs and reports

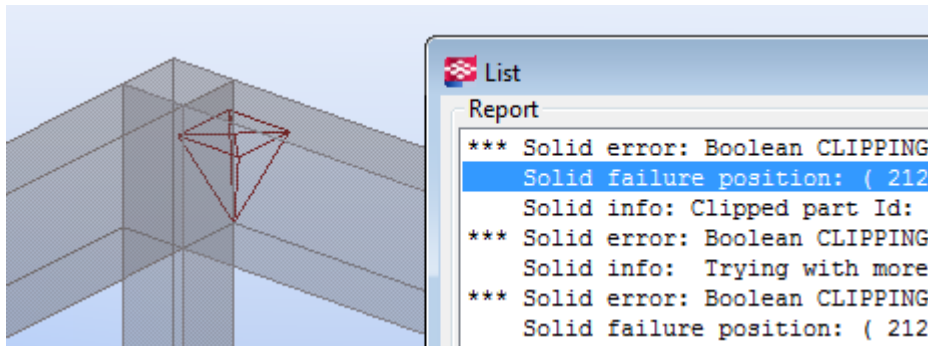
[Pour management on page 9](#)

### Example: Identifying and fixing a pour error

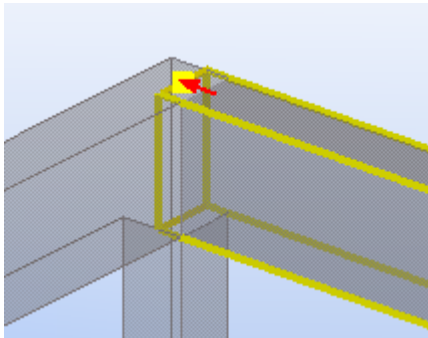
This is how an error related to a solid pour object can be indicated in a model view and in a drawing. The pour object is not shown as continuous, and there are extra lines between the parts in the pour object:



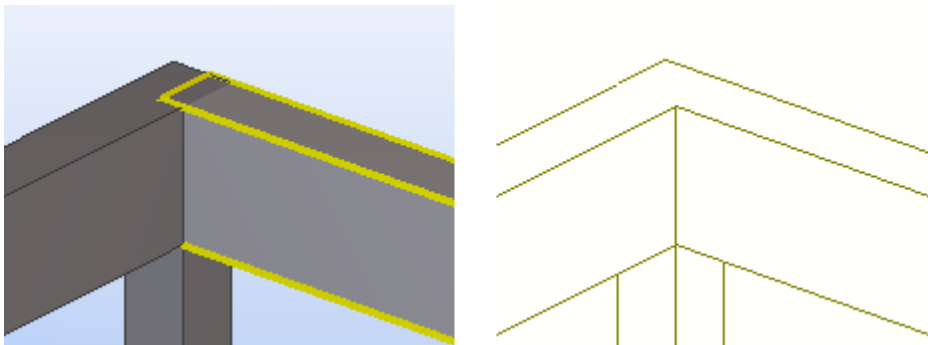
Checking the session history log file and clicking a `Solid failure position` row helps you to locate the error in the model (press **Ctrl+2** to see through the parts):



Try moving a beam end so that it is no longer on the same surface as the column side:



This is how the model and the drawing look like after you have fixed the model:



Also the volume of the pour object is now correct, for example, in reports. The overlapping volume of the beam and the column is only counted once.

See also [Troubleshooting pour errors on page 24](#)  
[Viewing pour errors in a log file on page 25](#)

## 1.7 Example: Creating concrete geometry and working with pours

The guidelines in this example help you to efficiently model cast-in-place concrete geometries, and to define, visualize, sequence, and report pours and pour breaks.

Before you start, ensure that you have the pour management functionality enabled. See [Enabling the pour functionality on page 10](#).

To create concrete geometry and work with pours:

1. If possible, use an existing engineering or architectural model or drawing as a basis when you create concrete structures in Tekla Structures.

Import the existing model or drawing as a reference model to your Tekla Structures model.

See [Inserting a reference model and Reference models](#).

2. If you are using an IFC model as a reference model:

- a. Convert the concrete structures you need from the IFC model to native Tekla Structures objects.

See [Converting IFC objects into native Tekla Structures objects](#), [Example: Converting IFC objects into Tekla Structures objects](#), and [IFC object converter](#).

- b. Check the conversion results.
- c. If needed, modify the converted objects.

For example, you may need to change the profile, material, or cast unit type of the converted objects.



Use **Organizer** for checking and selecting objects.

---

3. If you are using a different reference model type, or if there are structures that cannot be converted from an IFC model, model the needed concrete structures as cast-in-place concrete parts in Tekla Structures.

You can model by tracing over the reference model.

See [Creating concrete parts](#).

4. For each cast-in-place concrete part, define a pour phase number to divide your Tekla Structures model into pour objects.

For example, use the default pour phase 0 for horizontal structures, like beams and slabs, and the default pour phase 1 for vertical structures, like columns and walls, to separate them to different pour objects.

See [Defining the pour phase of a part on page 12](#).



Use selection filters or **Organizer** to efficiently select multiple parts and to modify them all at the same time.

---

5. View and check the pour objects in a pour view.

See [Viewing pour objects on page 14](#) and [Pour objects on page 13](#).

6. If needed, modify the pour phases or create pour breaks to fine-tune the pour objects.

For example, create pour breaks to split large slabs into smaller pour objects.

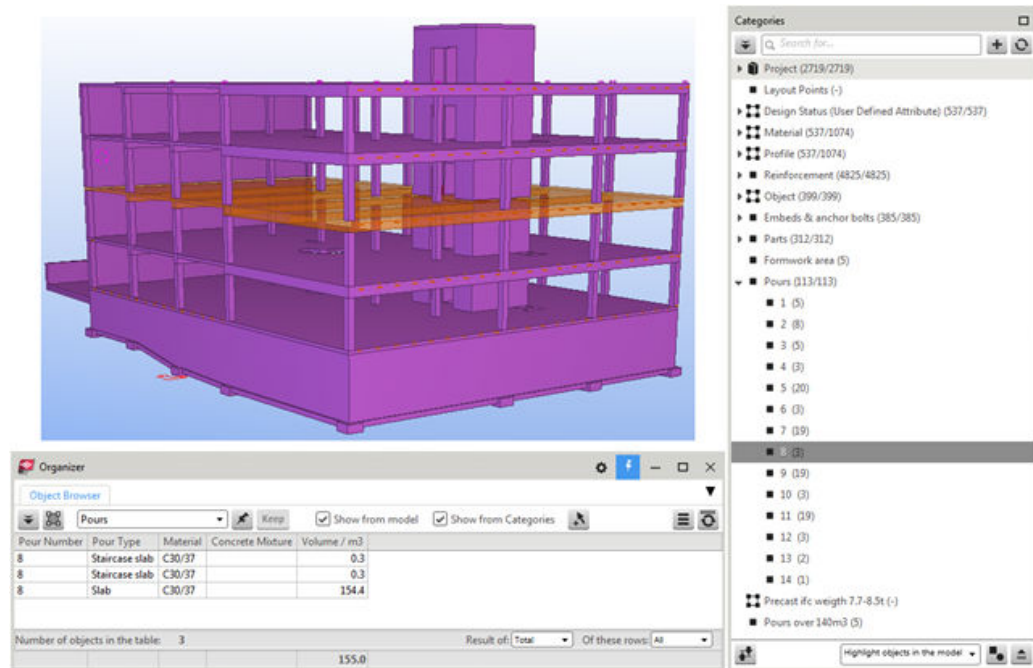
See [Creating a pour break on page 20](#) and [Pour breaks on page 18](#).

7. Once you are ready with the concrete geometry and pour objects, you can define pour sequences by entering pour numbers for pour objects, or by using the **Organizer** categories.

You can also define other properties for pour objects, for example, concrete mixtures, or dates or status of workflow.

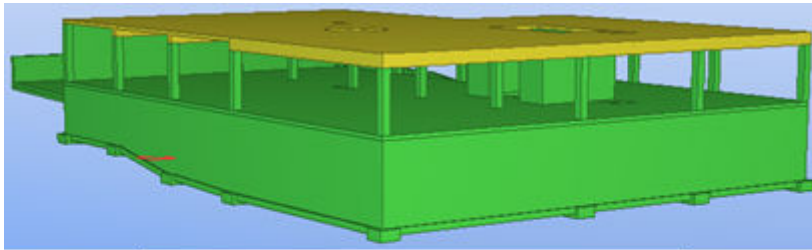
See [Modifying the properties of a pour object on page 16](#) and [Categories in Organizer on page 48](#).

8. Use **Organizer** to categorize pours. Then you can select them by their sequence and report pour-specific information, such as pour volumes and formwork areas.



See [Viewing object properties in Organizer on page 32](#) and [Creating a concrete quantity take-off using Organizer on page 81](#).

9. If you wish, use **Task Manager** to include pour objects in tasks and to schedule pours. You can then visualize pour status information based on planned and actual dates by using **Project Status Visualization**.



**Project Status Visualization**

Save Load standard Save as standard

Review  
Review date: 05.01.2015

Step backward or forward:  
 << >> 1 day(s)

Or select date on the time scale:  
 \_\_\_\_\_

Scale start: 05.01.2015 Scale end: 07.07.2015

Object representation: 4D Pour In Progress Edit...

☐ Refresh view automatically

Reporting  
☐ Create report

Report  
☒ Latest time step  
☐ Project status on review date

Report template: C ----- CIP REPORTS

Refresh Close

See [Creating a task on page 115](#), [Adding objects to a task on page 128](#), and [Project Status Visualization on page 156](#).

# 2 Organizer

**Organizer** is a daily tool for managing model information, object property queries, and object classification. Using **Organizer**, you can access all model information, including IFC information, in one place, and manage your model information effectively. **Organizer** is an efficient tool at any stage in the construction and design process for designers, detailers, managers, estimators, contractors, or anybody using the model information.

For example, construction managers can view and report on key properties of parts and groups of parts of the Tekla Structures model, such as the quantities of purchasing packages. Designers can instantly check object, assembly, or cast unit properties during design to ensure that the properties are as they are intended to be. By creating categories it is easy to automatically track, for example, precast or steel elements that are too heavy, reinforcing bars that are too long, and status info.

Organizer is always up-to-date as you can synchronize it with model. You can get instant feedback on what is happening in the model and create reports on demand.

**Organizer** consists of two tools:

- Use **Object Browser** to instantly view and create reports on model information based on the selections you make.
- Use **Categories** to define building locations to automatically arrange model objects and visualize the locations in the model. You can also define specific categories based on different properties. You can use filters to automatically update the category content whenever there are changes in the model. You can also manually change the content of categories.

**See also** [Viewing object properties in Organizer on page 32](#)

[Exporting object property values from Organizer on page 40](#)

[Creating a property template in Organizer on page 41](#)

[Modifying a property template in Organizer on page 44](#)

[Importing a property template to Organizer on page 47](#)

[Exporting a property template from Organizer on page 48](#)

[Categories in Organizer on page 48](#)

[Synchronizing Organizer with the model on page 64](#)

[Using Organizer location categories in reports on page 66](#)

[Exporting a category from Organizer on page 67](#)

[Importing a category to Organizer on page 69](#)

[Organizer in the multi-user mode on page 71](#)

[Example: Organizing the model into location and custom categories, and viewing quantities on page 71](#)

[Example: Tracking property based issues using Organizer on page 87](#)

[Example: Creating a custom category for structural design status in Organizer on page 97](#)

[Example: Creating a custom category for architectural design status in Organizer on page 98](#)



[Example: Organizer for steel - managing bolts on page 101](#)

[Example: Organizer for steel - managing assemblies on page 105](#)


[Example: Organizer for precast on page 107](#)

## 2.1 Viewing object properties in Organizer

You can view the properties of selected model objects in **Object Browser**. **Object Browser** lists the objects that you have selected in the model or the objects of the categories you have selected. The object properties are shown in columns. You can change the order and sorting direction of the columns, and group the properties to view the object data in a structured way.

Click **Tools --> Organizer** to open **Organizer**, and reload  **Object Browser** to show the latest object property values. If you are making changes in a large model, reloading **Object Browser** or synchronizing an individual category is faster than synchronizing **Organizer**. If you synchronize an individual category, you need to reload  **Object Browser**.







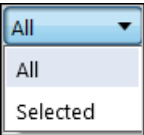





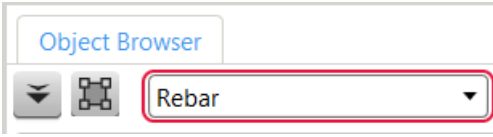

Synchronizing **Organizer**  updates all object properties in the **Organizer** database. When you have synchronized **Organizer**, the object properties are up-to-date until you make changes in the model. You do not need to reload **Object Browser** if you change the selection in the model, select another category, or another property template.



You can use Tekla Structures selection switches to select the needed objects in the model, assemblies, for example.

To view object properties in **Object Browser**, select model objects in the model or a category in **Categories**, and do any of the following:



To	Do this
Change the order of columns	Select a property column heading and drag it on the column heading row to the desired location.
Change the sorting direction	<ol style="list-style-type: none"> <li>Click a column heading to show the sorting direction. The default direction is ascending. You can change the default direction in <b>Settings</b> .</li> <li>Click the column heading again to change the sorting direction.</li> </ol>
Show assembly content	<ol style="list-style-type: none"> <li>Click  to show the objects belonging to the assemblies and cast units that are currently listed in <b>Object Browser</b>.</li> <li>Click  to hide the assembly content.</li> </ol>
Group object properties	<ol style="list-style-type: none"> <li>Click  and select <b>Grouping</b>.</li> <li>Select a property column heading and drag the column to the grouping row.</li> </ol>
Combine identical rows	<p>You can combine the rows that have the same property values to one row. When you combine rows, <b>Object Browser</b> displays a <b>Count</b> column that shows how many rows have been combined.</p> <p>You can also select whether to show a single property value or the sum of the values in a column. The sum of the values is the single value multiplied by the number of combined rows.</p> <ol style="list-style-type: none"> <li>Click  and select <b>Combining identical rows</b>. Combined rows are shown even if you select another category in <b>Categories</b>.</li> <li>If needed, click <b>Keep</b> to include the combined rows in the property template.</li> <li>To show the sum of the values in a column, go to <b>Settings</b> , find the property under <b>Columns</b> and select <b>Show result in combined rows</b>.</li> </ol>
Show calculated results of object property values in the sum row	<ol style="list-style-type: none"> <li>Select whether <b>Object Browser</b> calculates the results from all or selected rows.   </li> </ol>

To	Do this
	<p>2. Select whether <b>Object Browser</b> shows the calculated total, average, minimum or maximum values.</p> 
List the categories of objects in <b>Object Browser</b>	<p>1. Select one or more rows in <b>Object Browser</b>.</p> <p>2. Right-click and select <b>List categories</b>.</p> <p>The category list shows all the categories that contain at least one of the selected objects.</p> <p>3. Click a category in the category list to highlight the category in <b>Categories</b>.</p>
Hold the current view in <b>Object Browser</b>	<p>1. Click  to hold the current view in <b>Object Browser</b>.</p> <p>Your new selections in the model or in the categories are added to the <b>Object Browser</b> view.</p> <p>2. To remove an object from the view, right-click a row and select <b>Remove from the view</b>.</p> <p>3. Click  to release the view.</p>
View another property template	<p>Select another template from the template list to view the same object selection with a different template.</p> 
Set the default template	<p>1. Click <b>Settings</b> .</p> <p>2. Select a template from the template list and click <b>Set as default</b>.</p> <p>3. Click <b>Keep</b> to save your selection.</p> <p>The <b>Set as default</b> button is hidden when you have the default template open. When you select another template, the button is shown again.</p>
Pin the current template in <b>Object Browser</b>	<p>Pinning a template holds the selected template visible in <b>Object Browser</b>.</p> <p>When you pin a template and select different categories to view the model objects in <b>Object Browser</b>, the pinned template is shown even if the selected category has another</p>

To	Do this
	<p>template defined for it. This is useful if you want to compare different categories using a certain template.</p> <ol style="list-style-type: none"> <li>1. Click  to pin the current template in <b>Object Browser</b>. You can still select another template from the template list. Pinning always keeps the latest selected template visible.</li> <li>2. Click  to release the template.</li> </ol>

See also [Grouping object properties in Organizer on page 35](#)

[Viewing calculated property values in Organizer on page 37](#)

[Removing an object or a category from Object Browser in Organizer on page 39](#)


[Setting units in Organizer on page 39](#)

[Categories in Organizer on page 48](#)

## Grouping object properties in Organizer

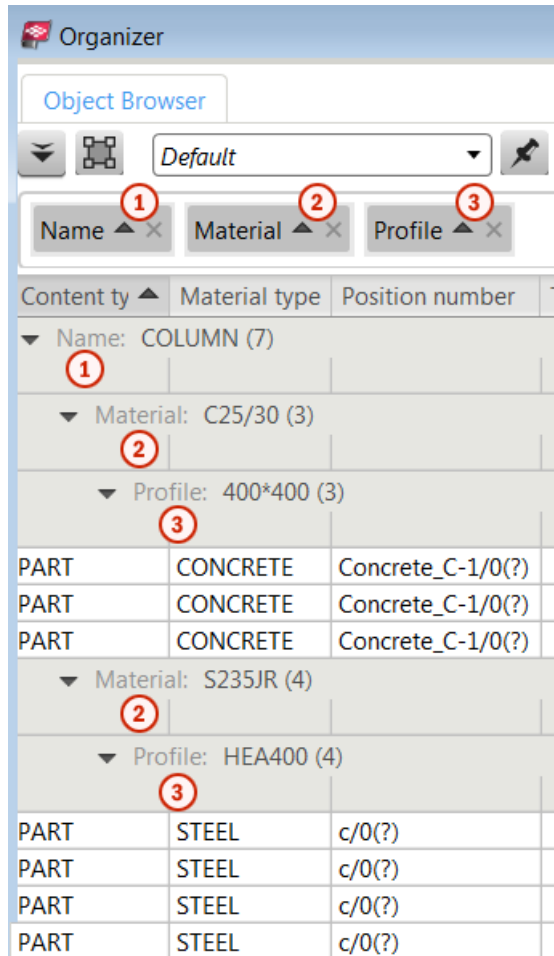
You can sort the objects shown in **Object Browser** by grouping the objects based on their properties. You can group object properties both in **Object Browser** and in **Settings**. The grouping you define in **Settings** is used in a property template when you save the template.


To group object properties in **Object Browser**:

1. Click **Tools** --> **Organizer**.
2. Select objects in the model or select a category to view the objects in **Object Browser**.
3. Click  and select **Grouping**.
4. Drag one or more property columns to the grouping row.


The objects are grouped according to the order of properties in the grouping row, from left to right.

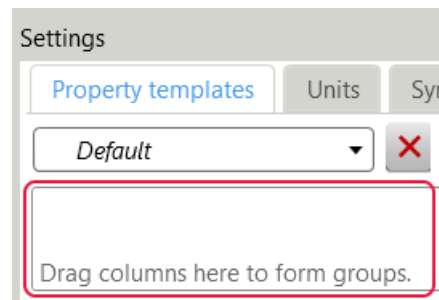
In the example below, the first grouping level is **Name** 1, the second level is **Material** 2, and the third level is **Profile** 3.



5. Do any of the following:
  - a. Drag the object properties in the grouping row to change the grouping order.
  - b. Click an object property in the grouping row to change the sorting direction.
  - c. Click  to remove an object property from the grouping row.  
You can also drag the object property back to the column headings row. When you drag the property, it is placed to the location where you drag it to.
6. Click **Keep** to include the grouping to the template.
7. To permanently save the grouping to the template, save the Tekla Structures model.



In **Settings**  the grouping row is always available.





When you group object properties in **Settings**, the grouping is simultaneously shown in the **Object Browser** if the grouping row is visible.


See also [Creating a property template in Organizer on page 41](#)  
[Viewing object properties in Organizer on page 32](#)

## Viewing calculated property values in Organizer

**Object Browser** shows the calculated total, average, minimum or maximum object property values in a sum row. You can select which values are shown, and whether the values are calculated from all the rows or from the rows you have selected in **Object Browser**.

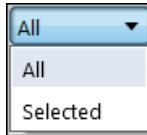
Before you start, reload **Object Browser**  to show the latest object property values. If you are making changes in a large model, reloading **Object Browser** or synchronizing an individual category is faster than synchronizing **Organizer**. If you synchronize an individual category, you need to reload **Object Browser** .



Synchronizing **Organizer**  updates all object properties in the **Organizer** database. When you have synchronized **Organizer**, the object properties are up-to-date until you make changes in the model. You do not need to reload **Object Browser** if you change the selection in the model, select another category, or another property template.

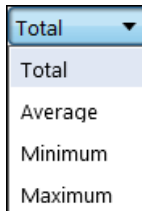
To view the calculated values of object properties:

1. Click **Tools --> Organizer**.
2. Select objects in the model or select a category to view the objects in **Object Browser**.
3. Select whether **Object Browser** calculates the results from all or selected rows.




**All** is the default.

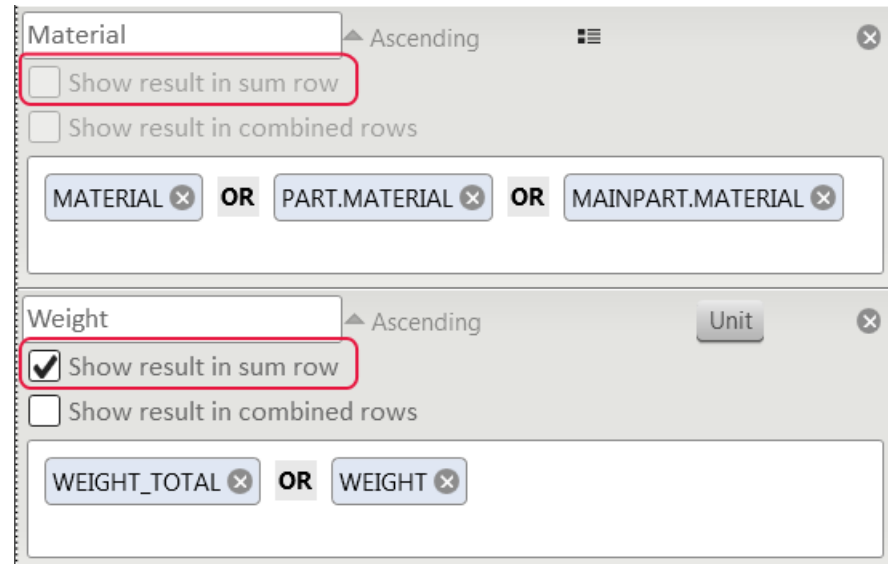
4. If you select **Selected**, select the rows in **Object Browser**.
5. Select a value option from the list:



The values are shown at the bottom in the sum row. The value is the rounded result of the precise object property values.

By default, **Object Browser** shows the calculated values of properties for which it is sensible to calculate results. If you do not want to show the calculated value of such a




property, go to **Settings**  and clear the **Show result in sum row** check box. The option is dimmed for properties whose values cannot be calculated and for properties whose values have different unit types.



See also [Viewing object properties in Organizer on page 32](#)  
[Setting units in Organizer on page 39](#)

## Removing an object or a category from Object Browser in Organizer

Click **Tools --> Organizer** to open **Organizer**. To remove an object or a category from **Object Browser**, do one of the following:


To	Do this
Remove an individual object from <b>Object Browser</b>	<ol style="list-style-type: none"><li>1. Select an object in the model or select a category.</li><li>2. Click  to hold the view.</li><li>3. Select the object to be removed in <b>Object Browser</b>.</li><li>4. Right-click and select <b>Remove from the view</b>.</li></ol>
Remove a whole category from <b>Object Browser</b>	<ol style="list-style-type: none"><li>1. Select a category.</li><li>2. Click  to hold the view.</li><li>3. Click  to show categories in <b>Object Browser</b>.</li><li>4. Select the category row in <b>Object Browser</b>.</li><li>5. Right-click and select <b>Remove from the view</b>.</li></ol>

See also [Viewing object properties in Organizer on page 32](#)  
[Viewing a category in Organizer on page 60](#)

## Setting units in Organizer

The default units in Tekla Structures depend on the settings in **Tools --> Options --> Options --> Units and decimals**. You can change these default settings in **Organizer** to view a different unit system, unit type, and precision in **Object Browser** and in **Categories**.



To set the units:

1. Click **Tools --> Organizer**.
2. Click **Settings** .
3. Go to the **Units** tab.
4. Select a unit system from the list.
5. Select a unit from the list.

6. Select a precision from the list.

Use the precision option for **Others** if you want to define the precision for quantities other than distance, area, volume, or weight.



You can set the unit of an individual property column in **Settings**  by clicking **Unit**  in the column. These individual settings override the **Units** tab settings. Individual settings are useful if you want to show the length in imperial and metric units in one template, for example.

---


See also [Viewing object properties in Organizer on page 32](#)  
[Viewing calculated property values in Organizer on page 37](#)

## 2.2 Exporting object property values from Organizer

You can export object property values from **Object Browser** to Microsoft Excel for further processing. The property columns in **Object Browser** are exported exactly as they are shown.

Ensure that you have Microsoft Excel installed on your computer before you start to export.

To export object property values from **Object Browser**:

1. Click **Tools** --> **Organizer** .
2. Click  and select **Export**.
3. Click **Browse** to select an Excel template.

**Object Browser** lists all the Excel templates that are available for the export in the following folders:

- Current model folder
- Project folder (XS\_PROJECT)
- Firm folder (XS\_FIRM)
- System folder (XS\_SYSTEM)

If you do not select a template, a default Excel template is used in the export.

4. Select whether the latest object properties from the model are updated to **Object Browser** for the export.
5. Click **Export**.

Microsoft Excel opens automatically. Grouping, combined rows, and calculated values (total, average, minimum and maximum) are also exported.



See also [Exporting a property template from Organizer on page 48](#)



## 2.3 Creating a property template in Organizer

You can create property templates in **Organizer** for different purposes. For example, you can create templates for different object types and object groups, and include the needed object properties in the template. You can group and sort the properties in the template.


To create a property template:

1. Click **Tools** --> **Organizer** .
2. Click **Settings**  .
3. If you want to create the new property template based on a current template, select the template from the list of templates.
4. Click  **Template** .
5. Enter a unique name for the property template.  
**Create** is dimmed if you enter the name of an existing template.
6. Select whether the template is created based on the current template or as a blank template.
7. Click **Create**.

Property templates are saved to the ProjOrg database in the \ProjectOrganizer folder in the model folder. Saved property templates are shown in the property template list.

**See also** [Object properties available in Organizer on page 41](#)  
[Creating a custom property in Organizer on page 42](#)  
[Creating a custom formula in Organizer on page 43](#)

### Object properties available in Organizer

The object properties available in **Organizer** are listed in **Settings**  . You can include object properties to a property template.

The properties are read from the .lst template attribute files defined in the contentattributes.lst file. This is a container file listing all the files that contain the actual attribute definitions. By default, contentattributes.lst is located in . . \Program Files\Tekla Structures\<version>\nt\TplEd\settings, but the location may be different in your environment. User-defined attributes are read from

the `objects.inp` files. Ensure that there are no space characters before or after the name of a user-defined attribute name.



Generally, there is no need to modify `contentattributes.lst`. Do not modify the file if you are not an administrator of Tekla Structures in your company.

To use properties that are not available in the property list, you can create custom properties in **Settings**. Such properties are reference model object properties, for example.

See also [Creating a custom property in Organizer on page 42](#)

## Creating a custom property in Organizer

Some object properties, for example, the properties of reference model objects are not automatically available in **Organizer**. To use these properties, you can create them as custom properties in **Settings**. You can use custom properties in the property columns in the same way as any other properties.

To create a custom property:

1. Click **Tools** --> **Organizer** .

2. Click **Settings** .

3. Click **Custom**.

4. Select **Property**.

5. Enter a name for the property in the **Name** box.

This name is shown in the property list. Ensure that there are no space characters before or after the name.

6. Enter the exact name of the property in the **Property** box.

**Organizer** uses this name to search for the property value. Ensure that there are no space characters before or after the name.



For reference model object properties you must add `EXTERNAL.` at the beginning of the property name, for example, `EXTERNAL.Tekla Reinforcement.Rebar Mark`. You can copy the exact name of the property from the **Inquire object** dialog box, for example.

7. Select a unit type for the property.

**Organizer** automatically selects the default **Data type** value of the unit type. You can change the data type.

8. Select a data type for the property.

9. Select a property type for the property.

Use the **Template** option for property names that are longer than 20 characters.

10. Click **OK**.

The property is shown in the **Object type** list under **Custom** properties. You can modify and delete custom properties by right-clicking the property.

See also [Creating a property template in Organizer on page 41](#)

## Creating a custom formula in Organizer

You can create simple mathematical formulas using the object properties that are available in **Organizer**. You can, for example, calculate areas of specific object types. You can add formulas to property columns in the same way as object properties.

To create a custom formula:

1. Click **Tools** --> **Organizer**.

2. Click **Settings** .

3. Click **Custom**.

4. Select **Formula**.

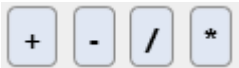
5. Enter a name for the formula.

Ensure that there are no space characters before or after the name.


6. Select an object type in the **Object type** list to narrow the selection or use the search box to find a property.

Object type **All** lists all the object properties in the model.

7. Drag the needed properties to the formula box in the **Create Formula** dialog box.
8. Drag the needed mathematical operators to the formula box and place them between the properties.

-  to add the main mathematical operation signs.

-  to add parentheses.

-  to add a box where you can enter a number, for example, 2.

The screenshot shows a 'Create Formula' dialog box. At the top, there's a close button (X). Below it, a 'Name:' label is followed by a text box containing 'AREA\_1'. Underneath is a row of operator buttons: '+', '-', '/', '\*', '(', ')', and '#'. The '#' button is highlighted with a red square. Below this is a larger formula bar containing 'AREA ×', a '\*' button, and a '2' button, which is also highlighted with a red square. To the right of the formula bar, there's a placeholder text: 'formula items here to complete formula.'. Below the formula bar is a 'Unit type' label followed by a dropdown menu currently showing 'No unit'. At the bottom right, there are 'Create' and 'Cancel' buttons.

9. If needed, drag the properties and operators inside the formula box to modify the formula.

**Organizer** automatically checks whether the formula is mathematically correct. If the formula is not correct, **Create** is dimmed and the incorrect parts are shown in red.

10. Select a unit type that is suitable for the properties used in the formula.



11. Click **Create**.

The formula is shown in the **Object type** list under **Custom** properties. You can modify and delete custom formulas by right-clicking a formula.

**See also** [Creating a property template in Organizer on page 41](#)

## Deleting a property template in Organizer

To delete a property template in **Organizer**:


1. Click **Tools** --> **Organizer** .
2. Click **Settings**  .
3. Select a property template from the list of templates.
4. Click  to delete the selected property template.




**See also** [Creating a property template in Organizer on page 41](#)

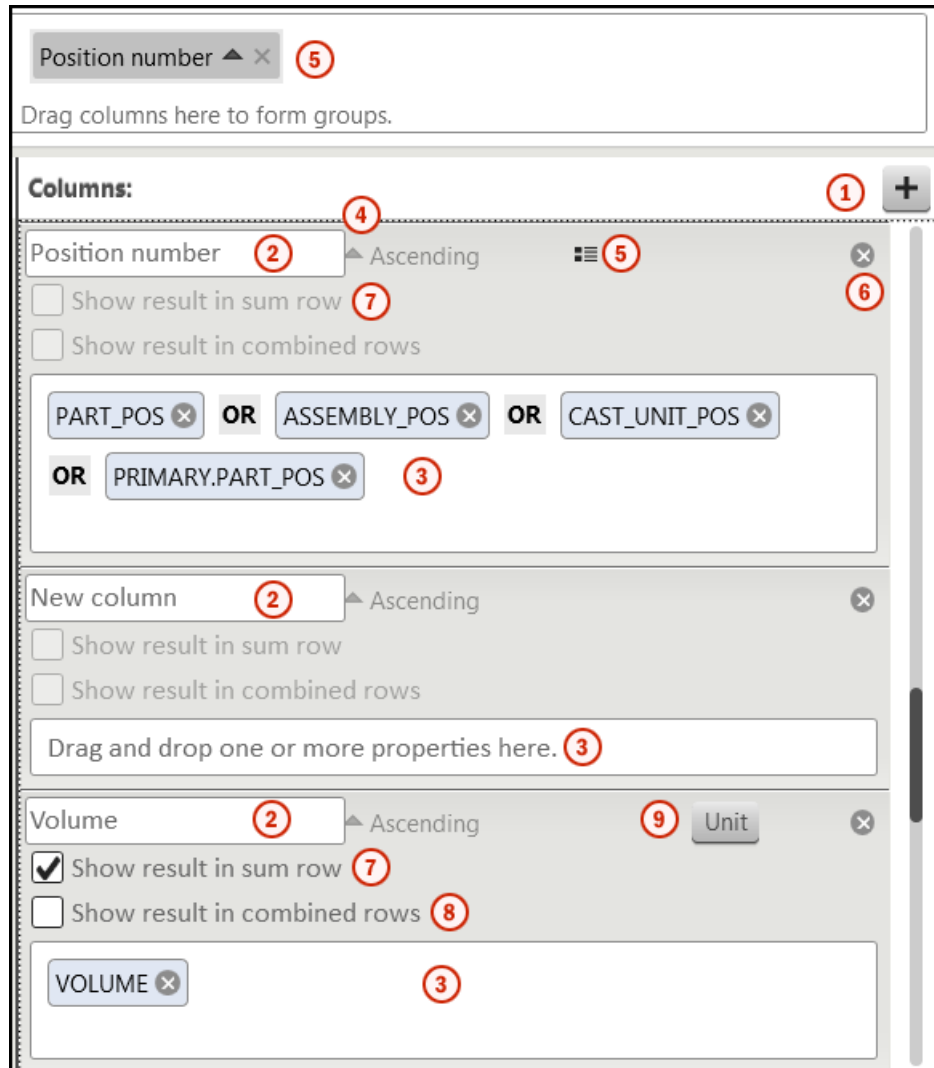
## 2.4 Modifying a property template in Organizer

You can modify the property templates that are used to view the properties of selected model objects in **Object Browser**.

To modify a property template:

1. Click **Tools** --> **Organizer**.
2. Click **Settings** .
3. Select the template you want to modify from the list of templates.
4. Do any of the following:

	Description
①	Create a new empty property column.
②	Rename a property column.
③	Drag one or more object properties from the list of object properties to a property column. You can use the <b>Search</b> box to easily find the relevant properties.
④	Click the sorting arrow  to change the sorting order in a property column.
⑤	Drag a property column to the grouping row. The grouping icon  is shown in the property column.
⑥	Delete a property column.
⑦	Clear the <b>Show result in sum row</b> check box if you do not want to show the calculated property values in <b>Object Browser</b> . The option is dimmed if the property values cannot be calculated or if the property values have different unit types.
⑧	Select the <b>Show result in combined rows</b> check box to show the sum of property values in the combined rows in <b>Object Browser</b> .
⑨	Click <b>Unit</b>  to set the unit and the precision of the unit for a property column.



5. Click **Keep** to modify the template.
6. To permanently save the changes to the template, save the Tekla Structures model.

### Example of using multiple object properties

It can be useful to have multiple object properties in one column. This way you can ensure that the relevant property value is found for different object types.

For example, you can include different name properties in the **Name** column. **Object Browser** shows **NAME** for parts, **ASSEMBLY\_NAME** for assemblies, **CAST\_UNIT\_NAME** for cast units, and so on.


When searching for the properties, **Object Browser** uses the order, from left to right, in which the properties are shown in the column. Once a value is found, the rest of the properties in the column are ignored.

See also [Object properties available in Organizer on page 41](#)

## 2.5 Importing a property template to Organizer

You can import to **Organizer** property templates that have been exported from the current model or other Tekla Structures models. The property templates are in the .xml format. You can import one or multiple templates at a time. You can save the property templates to the `..\Environments\environment\system\ProjectOrganizerData` folder to make them automatically available in all models.

To import a property template:

1. Click **Tools** --> **Organizer** .
2. Click **Settings** .
3. Click **Import**.
4. Select the .xml file you want to import.
5. Click **Open**.

The file is imported and shown in the property template list in **Organizer**. If an existing template has the same name as the imported file, **Organizer** adds a running number to the name of the imported file.

**Organizer** displays an error message if the selected .xml file is not a valid property template file and does not import the file.


If the imported template contains properties that are not in the object property list in **Organizer**, these properties are added as custom properties.

See also [Exporting a property template from Organizer on page 48](#)

## 2.6 Exporting a property template from Organizer

You can export property templates from **Organizer** to .xml files and use the exported templates in other models. You can export one or multiple templates at a time. Exporting the templates also ensures that you have back-up copies of the templates you have created.

To export a property template:

1. Click **Tools** --> **Organizer**.
2. Click **Settings** .
3. If you want to export a specific property template, select the template from the list of templates.
4. Click **Export**.
5. Select whether to export the current property template or all property templates.
6. Click **Browse** to select the destination folder.

By default, the templates are exported to the \ProjectOrganizer folder in the current model folder.

7. Click **Export**.

Each exported template creates a separate .xml file.

See also [Exporting object property values from Organizer on page 40](#)  
[Importing a property template to Organizer on page 47](#)

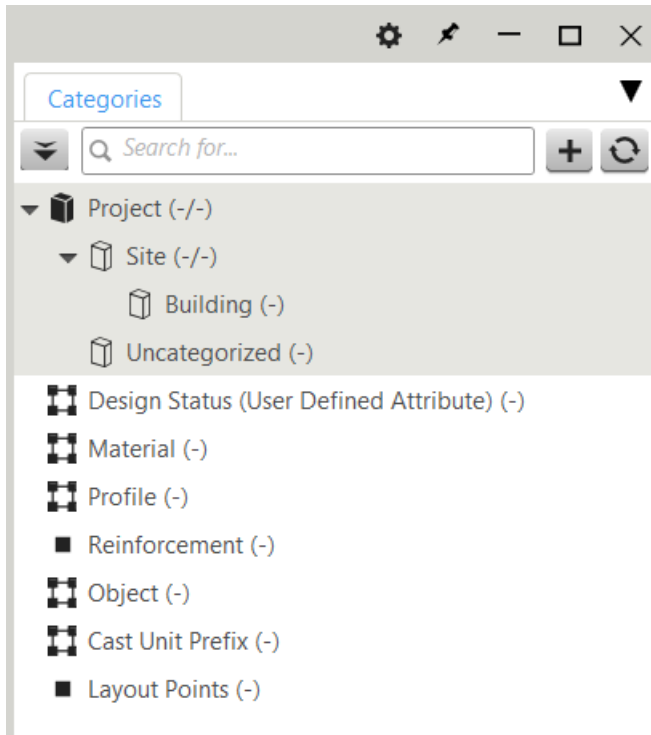
## 2.7 Categories in Organizer

You can categorize your model in location categories and other type of categories that you can create based on your needs, for example, based on object properties.

- Using location categories, you can create a location breakdown structure and divide the model into projects, sites, buildings, sections and floors. A project contains all objects in the model. Within a project, a model object can belong to only one lowest level location category at a time.  
**Organizer** always creates an uncategorized category in a project for objects that cannot be included in any other category based on the location definitions you have made. You can modify the definitions to include the objects to location categories.
- Other type of categories are custom categories that are created based on the rules that you define. Objects are added to the categories based on these rules. You can also create categories manually without rules.

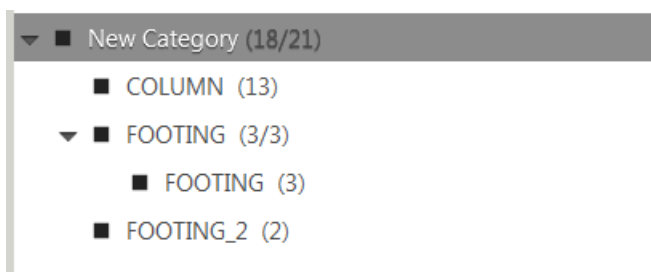
An example of a default category set in **Organizer**:





When you have included objects in the categories:

- On the lowest category level, the number of objects in the category is shown.
- On higher category level, both the number objects in the category and the total number of objects in the subcategories is shown.



**See also** [Creating location categories in Organizer on page 50](#)

[Creating location categories manually in Organizer on page 52](#)

[Creating a custom category in Organizer on page 53](#)

[Creating automatic subcategories for a category using properties in Organizer on page 55](#)

[Modifying a category in Organizer on page 57](#)

[Viewing a category in Organizer on page 60](#)

[Deleting a category in Organizer on page 61](#)

[Customized default setup for Organizer on page 62](#)

[Excluding object types from Organizer on page 64](#)



## Creating location categories in Organizer


You can create location categories by defining boundary boxes for the categories. This functionality allows you to organize model objects to sections and floors. The objects are automatically updated to categories based on their locations and the defined boundaries. If an object is not inside or within the limits of a boundary box, it will be placed in an uncategorized category that is automatically created.

To create location categories:

1. Click **Tools** --> **Organizer**.
2. Select **Building** in the category tree.
3. Right-click and select **Define boundary boxes for locations**.
4. On the **Building** tab, define the boundary box for the building.
  - a. If there are several grids in the model, select a grid for this building.

The grid selection is available only if there are several grids.

The grid selection shows the global x, y and z coordinates of the grid origins and the rotation of grids compared to the model origin coordinates.
  - b. If needed, change the default name of the building.
  - c. Define the x, y and z coordinates for the building boundary box by selecting the boundary coordinates from the list, or by entering suitable coordinates in the boundary coordinate boxes.
  - d. Click the  icon in front of the building to view the boundary box in the model.
  - e. Right-click in the model and select **Redraw View** to remove the boundary box from the model view.
5. On the **Sections** tab, define the boundary boxes for sections.
  - a. Click  **Section** to create one or more sections.
  - b. If needed, change the default names of the sections.
  - c. Define the x, y and z coordinates for the section boundary box by selecting the boundary coordinates from the list, or by entering suitable coordinates in the boundary coordinate boxes.

Ensure that the sections do not overlap and that they are inside the building boundary box. A red exclamation mark is shown in front of the coordinates if the boundary boxes overlap. You can save when the definitions are not overlapping.
  - d. Click the  icon in front of the section to view the boundary box in the model.
  - e. Right-click in the model and select **Redraw View** to remove the boundary box from the model view.

6. On the **Floors** tab, define the boundary boxes for floors.


The **Floors** tab is building-specific. The sections that you can apply in a floor structure are shown in a box at the top right. If you have not defined sections, the building is shown in the box.

- a. Click the **Add a new floor structure** button.

You can add as many floor structures as you need.

- b. If needed, enter a name for the floor structure.

- c. Do one of the following:

- Click  **Floor** to add floors to the floor structure.
- Click **Create floors based on grid** to create floors automatically based on the grid levels.


- d. If needed, change the default names of the floors.

- e. Define the z coordinates for the floors by selecting the boundary coordinates from the list, or by entering suitable coordinates in the boundary coordinate boxes.

- f. Drag a building or a section to the **Floor structure applied in** box to use the created floors in the building or section.

The **Floor structure applied in** box shows where the floor structure is used. Floor structures can be used in several buildings and sections. If the floor structure is used in some other building and you want to remove the floor structure from that other building, you need to open the boundary box definitions of that other building and make the modifications there.

- g. Modify the floor structure as needed by dragging or removing the sections from the **Floor structure applied in** box.

- h. Click the  icon in front of the floor to view the boundary box in the model.

- i. Right-click in the model and select **Redraw View** to remove the boundary box from the model view.

7. On the **Settings** tab, define how objects are placed in the categories.


**Organizer** checks the selected options in the order in which they are shown on the **Settings** tab, from top to bottom.

The objects that cannot be included in categories based on the default and the selected optional settings are placed in an **Uncategorized** category that is created automatically on the relevant level. You can either modify the boundary coordinates or manually move the objects to the correct location.

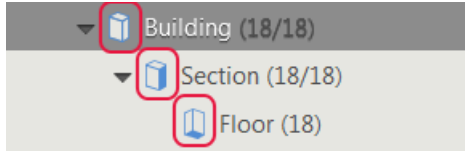
Note that if you have more than one project, you cannot move objects from one project to another.

8. **Save and Close.**

9. Right-click any category in the project and select **Synchronize the category** to refresh the category content from the model.

You can also click  to synchronize **Organizer**.

When you have created the categories, the icons in front of the categories are shown as blue in the category tree.



If you create more than one project, each project in the category tree contains all assemblies, cast units, pour objects, reference assemblies, or reference objects in the model. If there are reference assemblies in a reference model, the assemblies are included in the location categories. If there are no assemblies in a reference model, then the reference objects are included in the project categories. You need to use the automatic subdividing for the reference model to include the objects correctly.

See also [Categories in Organizer on page 48](#)  
[Modifying a category in Organizer on page 57](#)  
[Viewing a category in Organizer on page 60](#)  
[Deleting a category in Organizer on page 61](#)

## Creating location categories manually in Organizer

To create location categories manually:

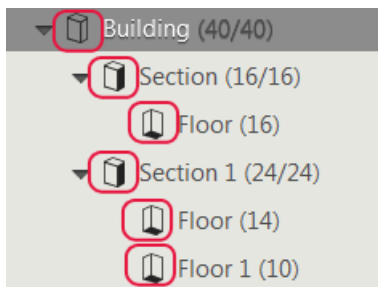
1. Click **Tools** --> **Organizer**.
2. Right-click a **Project** and select **New site**.  
You can also select **New project** to have **Organizer** automatically create **Site** and **Building** under the project.
3. Right-click the **Site** you created and select **New building**.
4. Right-click the **Building** you created and select **New section** or **New floor**.
5. Right-click the **Section** you created and select **New floor**.  
You can create as many projects, sites, buildings, sections, and floors as you need.
6. Add objects to the categories. Do one of the following:
  - Select a category in the project to show the model objects in **Object Browser** and select the objects that you want to move to the new category. Then drag the objects to the new category.

- In the model, select the objects that you want to move, right-click the new category and select **Move the selected objects**.



You cannot move objects from one project to another. Within a project, you can move model objects between the lowest level categories. One object can belong to only one lowest level location category at a time.

When you have created the categories manually, the icons in front of the categories are shown as black in the category tree.




**See also** [Categories in Organizer on page 48](#)  
[Modifying a category in Organizer on page 57](#)  
[Viewing a category in Organizer on page 60](#)  
[Deleting a category in Organizer on page 61](#)

## Creating a custom category in Organizer

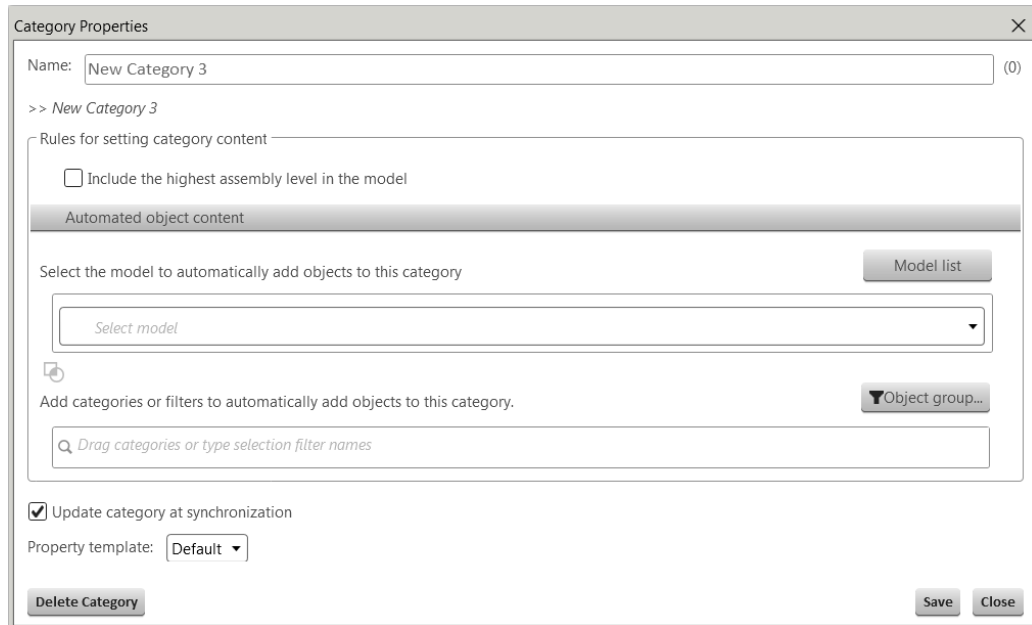
You can create custom categories to group model objects, for example, based on object properties.

To create a custom category:

1. Click **Tools --> Organizer**.
2. Click  to create a new category.

If you have a category selected, the new category is created on the same level as the selected category. If you have several categories selected or do not have any category selected, the new category is created at the root category level. You can add as many categories as you need.

3. Right-click the new category and select **Properties**.
4. Enter a name for the category.
5. Define the rules for setting the category content:



- a. Select the **Include the highest assembly level in the model** option if you want to ensure that you have only assembly level objects in the category.  
When you select this option and add a model object to the category, the assembly to which the object belongs will be added to the category.
- b. Click **Automated object content** to select the models, filters and categories that are used to automatically add objects to the category.
- c. Click the **Select model** list and select a model to add its objects to the category.
- d. Add other categories or filters to the rule box. Do one of the following:
  - Drag categories from the category tree.
  - Click or type in the box and select a filter from the list.
  - Click **Object group** to define a filter for **Organizer**.

The **Object Group – Organizer** dialog box opens in the Tekla Structures main view. When you have saved the filter, click or type in the rule box again and select the filter.


**Organizer** filters are saved in the `\attributes` folder of the model folder with the `.OrgObjGrp` file extension. You can use these filters only in **Organizer**.

You can add as many filters and categories as you want in the same rule box. To include all model objects in the category, select the `standard` filter.

If you add more than one category or filter to the same rule box, the category content is a union of the all objects in them.

If you add categories or filters to separate rule boxes, the category content is an intersection of the content of the boxes.



You can also separately create filters for **Organizer** before creating any categories. These filters are created in the same way as Tekla Structures selection and view filters, and you can use them in category rules. When creating the filters, click  in the filter settings and set **Organizer** as the filter type. Then define the settings needed in the filter.

---

6. Clear the **Update category at synchronization** check box if you do not want to update the category when you synchronize **Organizer** with the model.
7. Select a default property template for the category from the **Property template** list.  
This is the property template that is shown in the **Object Browser** property table.
8. Click **Save**.

**See also** [Customized default setup for Organizer on page 62](#)

[Categories in Organizer on page 48](#)

[Modifying a category in Organizer on page 57](#)

[Viewing a category in Organizer on page 60](#)

[Deleting a category in Organizer on page 61](#)

## Creating automatic subcategories for a category using properties in Organizer

You can create an automatic subcategory tree structure for one or several custom categories at a time. The categories for which you create the automatic subcategories cannot already have subcategories. If you use an empty category, only the category rules are saved.

To create automatic subcategories for a category using object properties:

1. Click **Tools --> Organizer**.
2. Right-click a custom category and select **Create a tree by property**.
3. Click the search box to open the list of the properties available in **Object Browser**.

## Create a category tree by property values

Grouping in Object Browser

ACN

ACN\_STATUS

ACTUAL\_END\_D

ACTUAL\_END\_E

ACTUAL\_END\_F

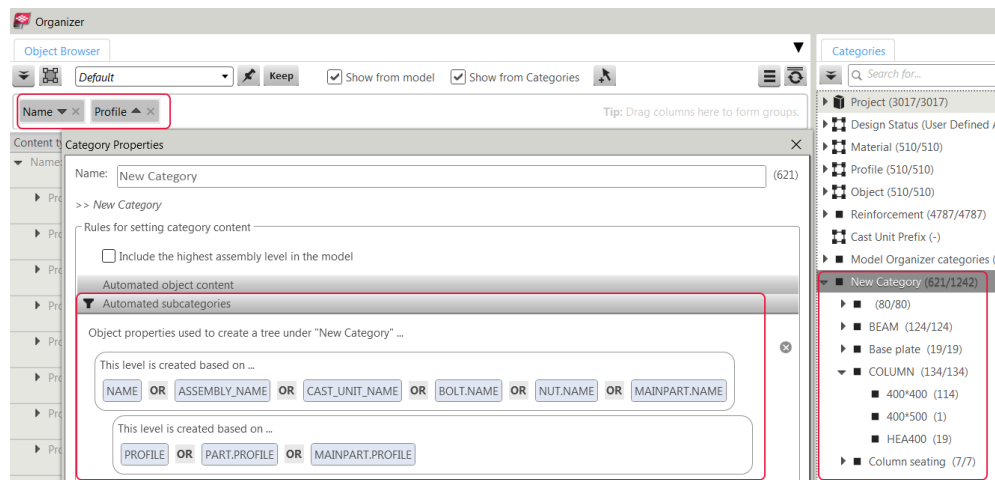
4. Select one of the following:

- A property

You can type the name of the property in the search box, for example, PROFILE.

- **Grouping in Object Browser**

To use this option, drag one or more property columns to the grouping row in **Object Browser**. **Organizer** uses the properties included in the column in the grouping row when creating the subcategories, for example, as shown in the image below.



5. Click **Create**.

**See also** [Categories in Organizer on page 48](#)

[Creating a custom category in Organizer on page 53](#)

[Modifying a category in Organizer on page 57](#)




[Viewing a category in Organizer on page 60](#)

[Deleting a category in Organizer on page 61](#)



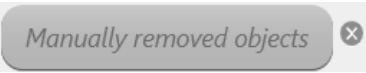



## Modifying a category in Organizer

Click **Tools --> Organizer** to open **Organizer**. To modify categories, do any of the following:

To	Do this
Rename a category	Right-click a category and select <b>Rename</b> .
Add objects to a category	<ol style="list-style-type: none"> <li>1. Select objects in the model or select a category.</li> <li>2. Select objects in <b>Object Browser</b> by selecting rows.</li> <li>3. Drag the selected objects to a category.</li> </ol> <p>If you want to add all the objects that you have selected in the model, you can also right-click the category and select <b>Add the selected objects</b>.</p> <p>Click the  button to hold the view in <b>Object Browser</b>. When you hold the view, you can make selections in the model or in the categories without changing the contents shown in <b>Object Browser</b>.</p> <p>Click the  button to show the categories in <b>Object Browser</b>.</p> <p>In location categories, when you select objects in one category and add them to another category, the objects are moved to the other category. An object can be in only one lowest level location category within a project.</p>
Remove objects from a category	<ol style="list-style-type: none"> <li>1. Select a category.</li> <li>2. Select the objects in <b>Object Browser</b>.</li> <li>3. Right-click and select <b>Remove the selected objects from the selected categories</b>.</li> </ol>
Modify category rules	<ol style="list-style-type: none"> <li>1. Right-click a category and select <b>Properties</b>.</li> <li>2. Click <b>Automated object content</b>. <p>The  icon shows that the category has automated object content rules defined.</p> <p>.</p> </li> <li>3. To modify the rules, do any of the following: <ul style="list-style-type: none"> <li>• Select a model from the list of models.</li> </ul> <p>You can click <b>Model list</b> to see which models are already used in the rules.</p> <ul style="list-style-type: none"> <li>• Drag a category from the category tree to the rule box.</li> <li>• Click or type in the rule box and select a filter from the list.</li> </ul> </li> </ol>

To	Do this
	<ul style="list-style-type: none"> <li>Click <b>Object Group</b> to define a filter for <b>Organizer</b>. When you have saved the filter, click or type in the box again, and select the filter.</li> </ul> <p>You can add more than one category and filter, and create unions and intersections of them.</p> <p>4. Click <b>Save</b>.</p>
Change the default property template of a category	<ol style="list-style-type: none"> <li>Right-click a category and select <b>Properties</b>.</li> <li>Select another property template from the <b>Property template</b> list.</li> <li>Click <b>Save</b>.</li> </ol>
Change the category content to include the highest assembly level	<ol style="list-style-type: none"> <li>Right-click a category and select <b>Properties</b>.</li> <li>Select the <b>Include the highest assembly level in the model</b> check box.</li> <li>Click <b>Save</b>.</li> </ol> <p>If you add parts to a category that includes only assemblies, the assembly information is shown in the category.</p>
Modify the boundary boxes of a building, section or floor category	<ol style="list-style-type: none"> <li>Right-click a category that you have created using boundary boxes.</li> <li>Select <b>Define boundary boxes for locations</b>.</li> <li>Modify the boundary box definitions.</li> </ol> <p>The categories you have created using boundary boxes have a blue icon in the category tree.</p>
Copy or move a category	<p>You can copy or move one category and its subcategories at a time.</p> <ol style="list-style-type: none"> <li>Select a category and drag it to a suitable location in the category tree, either on top of a category or between two categories.</li> <li>Select a suitable option from the list: <ul style="list-style-type: none"> <li><b>Copy</b> copies the category properties and the objects in the categories to the target category.</li> <li><b>Copy only the tree structure</b> copies the tree structure without the objects and their properties.</li> <li><b>Move</b> moves the category with the objects and their properties to the new location.</li> </ul> </li> </ol>
Remove all manual changes from a category	<p>You can remove manual changes from a category.</p> <ol style="list-style-type: none"> <li>Right-click a category and select <b>Properties</b>.</li> <li>Click <b>Automated object content</b>.</li> </ol>

To	Do this
	<p>The  icon shows that the category has automated object content rules defined.</p> <p>There is a <b>Manually added objects</b> and/or <b>Manually removed objects</b> button in the <b>Properties</b> dialog box if you have manually added and/or removed content.</p> <div>   </div> <p>You can visualize the objects in the model by clicking the button and checking the selection in <b>Object Browser</b>. Ensure that you have the <b>Show from model</b> check box selected in <b>Object Browser</b>.</p> <ol style="list-style-type: none"> <li>Click the  button on the right side of the <b>Manually added objects</b> or <b>Manually removed objects</b> button to remove the manual changes from the category.</li> </ol> <p>When you synchronize the category, the manual changes you removed are not taken into account anymore.</p>
Remove selected objects from manually added category content	<p>You can remove selected manually added objects from a category.</p> <ol style="list-style-type: none"> <li>Clear the <b>Show from Categories</b> check box and select the <b>Show from model</b> check box in <b>Object Browser</b>.</li> <li>Select the category, right-click and select <b>Properties</b>.</li> <li>Click <b>Automated object content</b>.</li> <li>Click the <b>Manually added objects</b> button to select the manually added objects in the model and to list them in <b>Object Browser</b>.</li> <li>In <b>Object Browser</b>, select the objects that you want to remove from the manually added category content.</li> <li>Right-click and select <b>Remove the selected objects from the selected categories</b>.</li> </ol> <p>When you synchronize the category the next time, the removed objects will be included in the category again only if they belong to the category based on the rules in the category properties dialog box.</p>
Remove selected objects from manually removed category content	<p>You can remove selected manually removed objects from a category.</p> <ol style="list-style-type: none"> <li>Clear the <b>Show from Categories</b> check box and select the <b>Show from model</b> check box in <b>Object Browser</b>.</li> <li>Select the category, right-click and select <b>Properties</b>.</li> <li>Click <b>Automated object content</b>.</li> <li>Click the <b>Manually removed objects</b> button to select the manually removed objects in the model and to list them in <b>Object Browser</b>.</li> </ol>

To	Do this
	<ol style="list-style-type: none"> <li>5. In <b>Object Browser</b>, select the objects that you want to remove from the manually removed category content.</li> <li>6. Right-click and select <b>Add the selected objects to the selected categories</b>.</li> </ol> <p>When you synchronize the category the next time, the objects you removed from the removed content will be included in the category only if they belong to the category based on the rules defined in the category properties dialog box.</p>




See also [Synchronizing Organizer with the model on page 64](#)



[Categories in Organizer on page 48](#)

[Viewing a category in Organizer on page 60](#)

## Viewing a category in Organizer

Click **Tools** --> **Organizer** to open **Organizer**. To view categories, do any of the following:

To	Do this
View the objects of a category in the model	<ol style="list-style-type: none"> <li>1. Select a category. The objects of the category are by default highlighted in the model.</li> <li>2. If you want to select the objects, select <b>Select objects in the model</b> from the list at the bottom of the categories. If you do not want to highlight or select the objects, select <b>No highlight or selection in the model</b> from the list.</li> </ol>
View the objects of a category in <b>Object Browser</b>	Select a category. The objects are shown in <b>Object Browser</b> when the <b>Show from Categories</b> option is selected.
View the objects per category in <b>Object Browser</b>	<p>Select one or more categories and click  to show the categories and the objects included in them.</p> <p>This is useful if you need to maintain the category structure in <b>Object Browser</b>.</p>
To view unions and intersections of categories in <b>Object Browser</b>	<ol style="list-style-type: none"> <li>1. Select categories in the category tree.</li> <li>2. Ensure that the <b>Show categories in Object Browser</b>  button is not active.</li> <li>3. Click  to show the selection pane.</li> </ol>

To	Do this
	<p>The selection pane shows either a union or an intersection of the selected categories, depending on what you have selected.</p> <p>Two categories in the same category root by default form a union. Two categories in different category roots by default form an intersection.</p> <p>4. Do any of the following:</p> <ul style="list-style-type: none"> <li>Click  to show the intersection of all selected categories.</li> <li>Click  to show the union of all selected categories.</li> <li>Drag categories between the boxes to modify the unions and intersections.</li> </ul>

**See also** [Categories in Organizer on page 48](#)  
[Modifying a category in Organizer on page 57](#)  
[Viewing object properties in Organizer on page 32](#)

## Deleting a category in Organizer

To delete a category:

1. Click **Tools** --> **Organizer** .
2. Select a category.

You can select more than one category.

3. Right-click and select **Delete**.

If you have used the selected category in the property rules of other categories, **Organizer** shows a dialog box where these categories are listed.

4. Click **Yes** to delete.



There must be at least one location category and one custom category in the **Organizer** category tree. You cannot delete the last categories.

---



To permanently delete a subcategory from a category created with the **Create a tree by property** command, you must remove the subcategory objects from the main category. If you do not remove the objects from the main category, the subcategory will be created again based on the main category rules when you synchronize **Organizer**.

---

See also [Categories in Organizer on page 48](#)

## Customized default setup for Organizer

You can customize **Organizer** by creating a setup that opens the same templates and categories in all new models. A customized setup is useful if you have templates and categories you want to use in all models. Then you do not need to create or import the templates and categories for each model separately. The customized setup is used when you open **Organizer** in a model for the first time.

To make the customized property templates and categories available in all models, store the templates in the `\ProjectOrganizerData\PropertyTemplates` folder and the categories in the `\ProjectOrganizerData\DefaultCategoryTrees` folder. The templates and categories are stored as `.xml` files.

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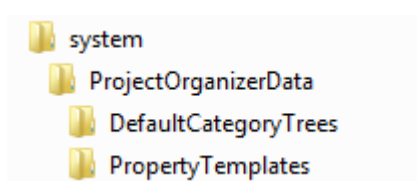
The defined location categories are automatically imported but they behave like manually created categories. Automatic categories need to be defined in each model separately.

---

You can have the folders under any or all of the following folders:

- Current model folder
- Project folder, defined in the `XS_PROJECT` advanced option
- Firm folder, defined in the `XS_FIRM` advanced option
- System folder, defined in the `XS_SYSTEM` advanced option

Example of the `\system` folder:



All templates and categories in these folders are loaded to **Organizer** when you open it for the first time in a model. If there are many files with the same file name in several different folders, the first file found is loaded and the other files with the same file name are ignored. The search order is always: model, project, firm, system. The `roles.ini` does not affect this order.

For example, if you have `rebar.xml`, `category.xml` and `material.xml` in the `..\system\ProjectOrganizerData\DefaultCategoryTrees` folder, these files will all be loaded automatically to the categories. If you also have a `rebar.xml` file in the `..\PROJECT\ProjectOrganizerData\DefaultCategoryTrees` folder and in the `..\model\ProjectOrganizerData\DefaultCategoryTrees` folder, only the first `rebar.xml` file found is used. In this case, the file under the model folder would be the first one found.

---



You can use the `roles.ini` files to control multiple setups. For example, create a `..\Concrete\ProjectOrganizerData` folder and a `..\Steel\ProjectOrganizerData` folder under the firm folder. Then define in the `roles.ini` file which of these folders is read and/or in which order the folders are read. This way you can read only the `\Concrete` folder `.xml` files, or read the `\Concrete` folder first. In this case, the `.xml` files with the same name in the steel folder are ignored.

---

The loaded templates and categories are saved in the `ProjOrg.db` in the `\ProjectOrganizer` folder under the model folder. When you open **Organizer** for the first time, the `ProjOrg.db` is created and the files are read in from the model, project, firm and system folders. The `ProjOrg.db` database stores all template and category information used in the model. When you make changes to the templates and categories in the folders, they are not automatically updated in `ProjOrg.db`. The database will not read in the template and category `.xml` files again, so updates to the files will not be automatically applied.

If you want to apply the changed templates and categories to the `ProjOrg` database, you have two options:

- Delete the old templates and categories in **Organizer** and import the changed templates and categories. We recommend that you use this option.
  - Export from **Organizer** all the templates and categories that you want to keep and close the model. Delete the `ProjOrg.db` database from the `\ProjectOrganizer` folder under the model folder, and re-open the model. Import the exported templates and categories back to **Organizer**.
- 



The second option will reset **Organizer** completely. All data will be lost if not exported.

---

**See also** [Categories in Organizer on page 48](#)

[Importing a category to Organizer on page 69](#)

[Importing a property template to Organizer on page 47](#)

[Exporting a category from Organizer on page 67](#)

[Exporting a property template from Organizer on page 48](#)

## Excluding object types from Organizer

Some object types can be excluded from **Organizer**. These object types are listed in the `ExcludedTypesFromOrganizer.xml` file that is by default located in the `\system\ProjectOrganizerData` folder in the Common environment. The location may vary depending on your environment. Excluded object types are not displayed in **Object Browser** and they are not included in categories, even if you select in the category rules to include a model and all its objects to a category. For example, loads, cuts and fittings are listed in the `ExcludedTypesFromOrganizer.xml` file and excluded from **Organizer**.

You can modify the `ExcludedTypesFromOrganizer.xml` file to either include or exclude the object types. Before you modify the file, we recommend that you copy it to the `\ProjectOrganizerData` folder that is under the model folder. You may need to create the `\ProjectOrganizerData` folder as it does not by default exist in the model folder.

For example, to exclude fittings, change the value as follows:

`<Fitting>true</Fitting>` to `<Fitting>false</Fitting>`

To include fittings again, change the value `false` back to `true`.




Do not add or remove any lines from the `ExcludedTypesFromOrganizer.xml` file, otherwise **Organizer** will not be able to use the file.





## 2.8 Synchronizing Organizer with the model

You can synchronize **Organizer** with the model to ensure that the categories are up-to-date and that **Object Browser** shows the latest object property values from the model. Synchronization adds location information to model object properties. You can use the location information when creating reports and inquiries. When you open **Organizer**, a **Synchronize** dialog box is always displayed. You can also synchronize individual categories or reload **Object Browser**.

To synchronize **Organizer** with the model, use any of the following synchronization options when needed. Click **Tools** --> **Organizer** to open **Organizer**.

To	Do this
Always synchronize <b>Organizer</b> with the model at opening	<ol style="list-style-type: none"><li>1. Click <b>Settings</b> .</li><li>2. Go to the <b>Synchronization</b> tab and select the <b>Always synchronize Organizer with the model when opening</b> check box.</li></ol>



To	Do this
Synchronize all categories with the model	Click  in <b>Categories</b> .
Synchronize the categories with the model	<ol style="list-style-type: none"> <li>1. Select the categories you want to synchronize. Right-click and select <b>Synchronize category</b>.</li> <li>2. Right-click the category again to view the synchronization date and time.</li> </ol>
Exclude a category from synchronization	<ol style="list-style-type: none"> <li>1. Right-click a category and select <b>Properties</b>.</li> <li>2. Clear the <b>Update category at synchronization</b> check box.</li> </ol> <p>Objects that are deleted from the model are removed from the category even if the <b>Update category at synchronization</b> option is not selected.</p>
Reload <b>Object Browser</b>	<p>Click  in <b>Object Browser</b>.</p> <p>Reload <b>Object Browser</b> if you make changes in the model while viewing the objects.</p> <p>Synchronizing <b>Organizer</b>  updates all object properties in the <b>Organizer</b> database. With large models, this may take minutes. When you have synchronized <b>Organizer</b>, the object properties are up-to-date until you make changes in the model. You do not need to reload <b>Object Browser</b> if you change the selection in the model, select another category, or another property template.</p> <p>If you are making changes in a large model, reloading <b>Object Browser</b> or synchronizing an individual category is faster than synchronizing <b>Organizer</b>. If you synchronize an individual category, you need to reload  <b>Object Browser</b>.</p>

See also [Categories in Organizer on page 48](#)  
[Full synchronization of Organizer on page 65](#)  
[Partial synchronization of Organizer on page 66](#)

## Full synchronization of Organizer

**Organizer** is fully synchronized:

- When you click the  button.

- When you select to synchronize **Organizer** when opening it.

Full synchronization:

- Refreshes the **Organizer** database with all the model objects and their properties.
- Refreshes the content of the location categories based on the boundary box definitions.
- Refreshes the category content, including the categories created with the **Create tree by property** command, based on the rules in the category properties.
- Removes those objects from the categories that have been deleted from the model.
- Adds the location information as a property to the model objects.


See also [Partial synchronization of Organizer on page 66](#)

## Partial synchronization of Organizer

**Organizer** is partially synchronized:

- When you synchronize a location category. Synchronizing any location category, for example a **Floor**, updates the whole project.
- When you synchronize a custom category that has rules defined in the category properties. When you synchronize a category that has rules, the categories that are used in the rules are also updated.
- When you synchronize categories at export.



Partial synchronization does not update the properties shown in **Object Browser**. You need to reload  **Object Browser** to show the updated category content.

See also [Full synchronization of Organizer on page 65](#)

## 2.9 Using Organizer location categories in reports

You can use location category properties in reports. If you have more than one project in a model, you need to select which project, including the subcategories in the project, is used in reporting. You can use only one project at a time. When you synchronize a project, report properties are always written to the model.

To select a project for reporting:

1. Select a **Project**.
2. Right-click and select **Use for reporting**.

The icon in front of the **Project** that is selected for reporting is shown as black .

3. Right-click the **Project** again and select **Write to model for reporting**.

The report properties are updated to the model.

The location properties of the assembly level objects in the model are:

- LBS\_PROJECT
  - LBS\_BUILDING
  - LBS\_SECTION
  - LBS\_SITE
  - LBS\_FLOOR
  - LBS\_FLOOR\_ELEVATION
  - LBS\_HIERARCHY\_LEVEL\_NUMBER
  - LBS\_HIERARCHY
4. To change the project used for reporting, right-click another **Project** and select **Use for reporting**.
  5. Right-click the **Project** again, and select **Write to model for reporting**.  
The report properties are updated to the model.



When using location properties in a report template, you need to add `LOCATION_BREAKDOWN_STRUCTURE` to the property name, for example, `LOCATION_BREAKDOWN_STRUCTURE.LBS_FLOOR`.

---


See also [Categories in Organizer on page 48](#)

[Synchronizing Organizer with the model on page 64](#)

## 2.10 Exporting a category from Organizer

You can export categories from **Organizer** to an `.xml` file and use the exported categories in other models. You can export the selected categories, or all categories including both the location categories and custom categories, at a time. **Organizer** creates only one `.xml` export file even if you export more than one category at a time. By exporting categories you can ensure that you have back-up copies of the categories you have created.

To export categories from **Organizer**:

1. Click **Tools --> Organizer**.
2. Select one or more categories.
3. Click  and select **Export Organizer categories**.
4. Define the export settings.

- a. Select **All categories** or **Selected categories with their subcategories**.
    - Exporting location categories: The whole project is exported even if you only select a subcategory in the project, for example, a floor.
    - Exporting categories that have been created using rules: The whole category tree is exported. If you select a subcategory, the main category and the other subcategories in the category tree are also exported.
    - Exporting categories that have been created manually: Only the selected category is exported.
  - b. Select the **Include the properties of the categories** check box to include category properties in the export.
    - If the rules in category properties include a filter, and you plan to use the category in another model, the filter must be available in that model. Otherwise, the category will not have the correct content.
    - If you do not select **Include the properties of the categories**, only the category name is exported. The property template is set to the default template in the export.
  - c. Select the **Include the objects** check box to include the object GUIDs in the export.
    - If you have manually added or removed objects and want to include them in the export, you have to select **Include the objects** as manually added or removed objects are tracked by GUIDs.
    - If the exported category is used in other models, the GUIDs are not the same and the category behaves as if it had no manually added or removed objects. If the category is imported back to the original model, **Organizer** finds the objects based on their GUIDs. If a GUID is not found, or if it has been deleted, the object is not included in the category.
  - d. Select the **Synchronize the categories before export** check box if you want to ensure that the latest GUIDs are included in the export.
5. Click **Browse** to select the destination folder.  
By default, the category is exported to the `\ProjectOrganizer` folder in the current model folder.
  6. Click **Export**.  
If the category you are exporting includes other categories in the category property rules, and you have not selected these other categories to the export, the **Export category structure references** dialog box is displayed.

- a. **Export the valid references** exports categories including the rules defined in the category.

This option is dimmed when you have not selected the categories defined in the rules for export. Click **Cancel** and select the category to export and the categories used in the rules. When you do this, the **Export category structure references** dialog box is not shown at all. In import, all exported categories will now be imported.

- b. **Export without references** exports the object GUIDs in the categories if you have selected the **Include the objects** check box in the **Export category structure** dialog box.

If you have not selected to include the objects, only the category name is exported. In import, **Organizer** treats this category as a manually created category.

7. Click **OK**.


See also [Importing a category to Organizer on page 69](#)

[Categories in Organizer on page 48](#)

## 2.11 Importing a category to Organizer

You can import categories that have been exported from **Organizer** in the current model or in other Tekla Structures models. The category import files are in the `.xml` format. You can import one `.xml` file at a time. The file can contain many categories.

To import categories to **Organizer**:

1. Click **Tools** --> **Organizer**.
2. Click  and select **Import Organizer categories**.
3. Click **Browse**.
4. Select the `.xml` file you want to import.
5. Click **Open**.
6. Click **Import**.

If the category you are importing has the same name as an existing category, you have the following options:

- You can import the category and replace the existing category.
- You can select not to import the category.
- You can import the category but keep the existing category. If you import a category that has the same name as an existing category, **Organizer** adds a running number to the category name.

Location categories are added at the end of the location categories and custom categories at the end of the custom categories.



If the imported category does not contain any objects, check if the rules in the category properties have a filter that does not exist in the model. When you add

the filter to the model, the category content is updated. Another reason could be that there are no objects in the model that match the rules.

The category may also be empty if it has only manually added content and the objects were not included in the export. If you have imported the category from another model, the manually added content is not imported.

---

**See also** [Categories created in earlier Tekla Structures versions on page 70](#)

[Exporting a category from Organizer on page 67](#)

[Categories in Organizer on page 48](#)

### Categories created in earlier Tekla Structures versions

If you have used the **Model Organizer** tool in the same model in an earlier Tekla Structures version, the categories created in **Model Organizer** are automatically transferred to **Organizer**. **Model Organizer** categories are shown in the custom categories in **Organizer**.

When you are using **Organizer** in a model created in an earlier Tekla Structures version:

- If you have never opened **Model Organizer** in the earlier Tekla Structures version model, no categories are imported.
- If you have opened and closed **Model Organizer** in the earlier Tekla Structures version model, the project and site logical area categories are imported to **Organizer**.
- If you have added at least one object to the **Model Organizer** logical area categories, the logical area categories are imported to **Organizer**.
- If you have added at least one object to the **Model Organizer** object type categories, all the categories are imported to **Organizer**.

**Model Organizer** property sets are imported to **Organizer**, converted to property templates, and named after the categories. If several categories have the same name, a running number is added to the property template name.

**See also** [Importing a category to Organizer on page 69](#)

[Categories in Organizer on page 48](#)

## 2.12 Importing IFC categories to Organizer

You can import the location breakdown structure of an IFC model as IFC categories to the location categories in **Organizer**.

To import IFC categories:

1. Click **Tools --> Organizer**.

2. Right-click a **Project** and select **New IFC project**.
3. Select the IFC model.
4. Click **Import**.

The IFC categories are imported at the bottom of location categories. The objects of the imported IFC model are automatically included in the IFC categories.

5. If the IFC model is changed, you can update the latest version of the model to the categories. Right-click the highest IFC category level in the category tree and select **Update**.



If you import IFC categories that have the same name as existing IFC categories, **Organizer** adds a running number to the category name. You can rename the categories.

---

See also [Categories in Organizer on page 48](#)

## 2.13 Organizer in the multi-user mode

When using **Organizer** in the multi-user mode, only one user at a time can save changes. The first user who opens **Organizer** becomes the main user and is the only user who can save changes. When the main user closes **Organizer** and saves the model, another user who wants to save changes must first close **Organizer** and open it again to be able to save changes.

Even though only one user at a time can save changes, other users can still select, create and modify categories and property templates. Other users can also export the categories and property templates they have changed, and import them back to **Organizer** for saving.



**Organizer** data is not shared in Tekla Model Sharing.

---

See also [Organizer on page 31](#)

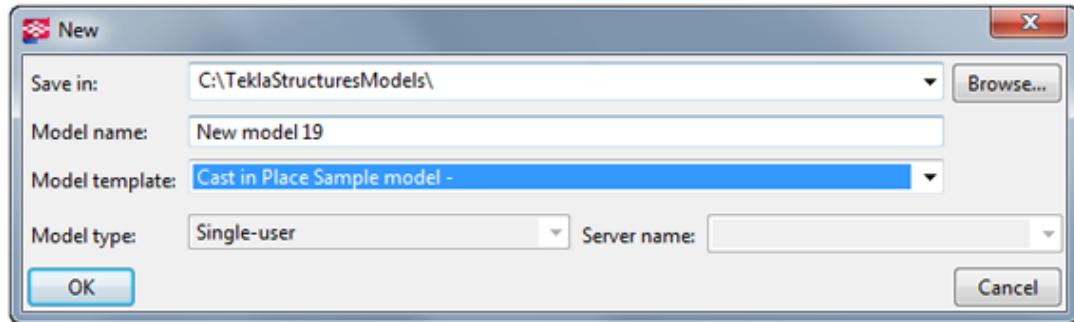
## 2.14 Example: Organizing the model into location and custom categories, and viewing quantities

This example will go through the basic workflow of setting up **Organizer**, and creating concrete and reinforcing bar take-offs.

You will use **Organizer** to organize your model into buildings, sections and floors based on the locations in the model. You will create a category tree structure and custom categories.

When you have created the locations and custom categories, it is fast and easy to view and report quantities in **Object Browser**.

In the example, the set-up is done using the `Cast in Place Sample model` that is available in the **Default** environment as a model template. When you open the sample model in Tekla Structures, the set-up described in this example has already been made. You can delete the set-up or just create a new project and start setting that up.



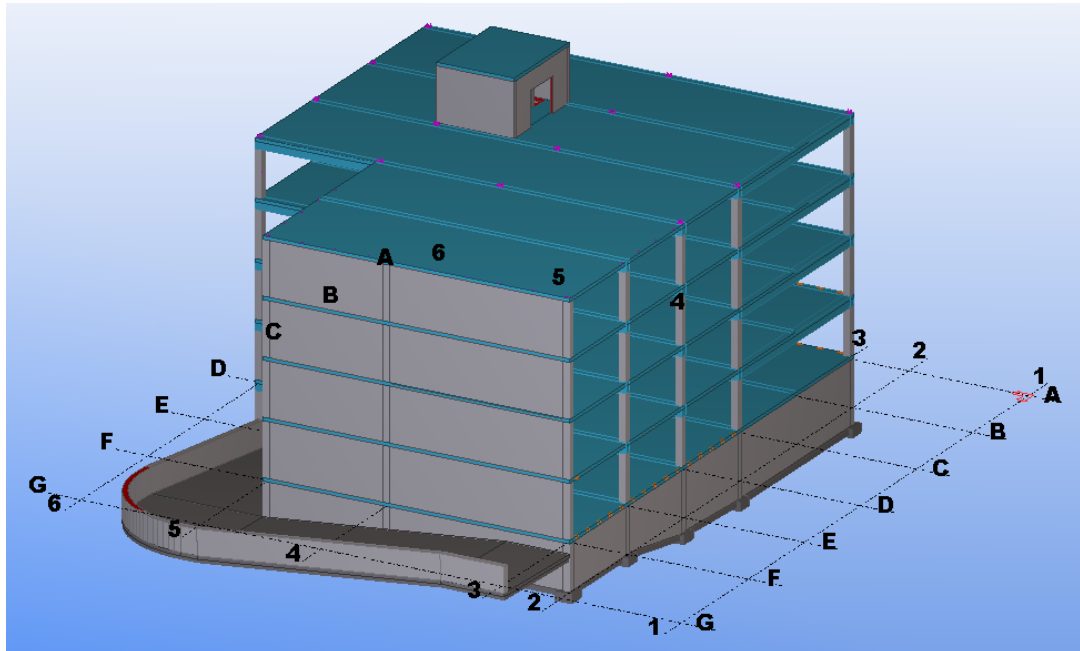
1. [Organizing the model to buildings, sections and floors on page 72](#)
2. [Creating a custom category with a tree structure based on object names in Organizer on page 76](#)
3. [Creating a custom category for reinforcing bars in Organizer on page 79](#)
4. [Creating a concrete quantity take-off using Organizer on page 81](#)
5. [Creating a reinforcing bar quantity take-off for first floor columns using Organizer on page 84](#)

See also [Organizer on page 31](#)



## Organizing the model to buildings, sections and floors

You will now organize your model to location categories. This is phase 1 in the example workflow of [Example: Organizing the model into location and custom categories, and viewing quantities on page 71](#).



To organize the model to location categories:

1. Click **Tools** --> **Organizer** .
2. Create a new building under a **Project** in **Categories**.
3. Adjust the boundary box for the building by selecting or entering coordinates.

Boundary boxes for locations

Location definition for "Project > Site > Building"

Building Sections Floors Settings

Grid origin in the model (0, 0, 0) Rotation 0°

Building name	Local X Axis	Local Y Axis	Local Z Axis
Building	-300	-300	-5 000
	36 500	37 500	20 000

Save Close

- Go to the **Sections** tab and add two sections to your building using the values shown in the image below.

Boundary boxes for locations

Location definition for "Project > Site > Building"

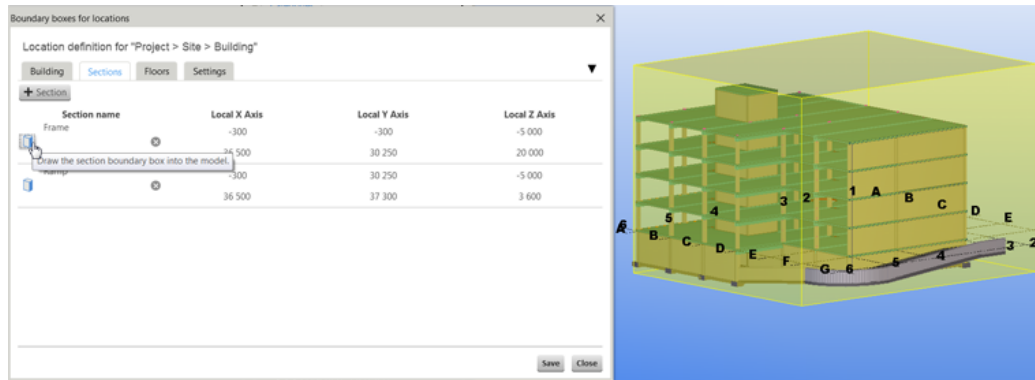
Building Sections Floors Settings

+ Section

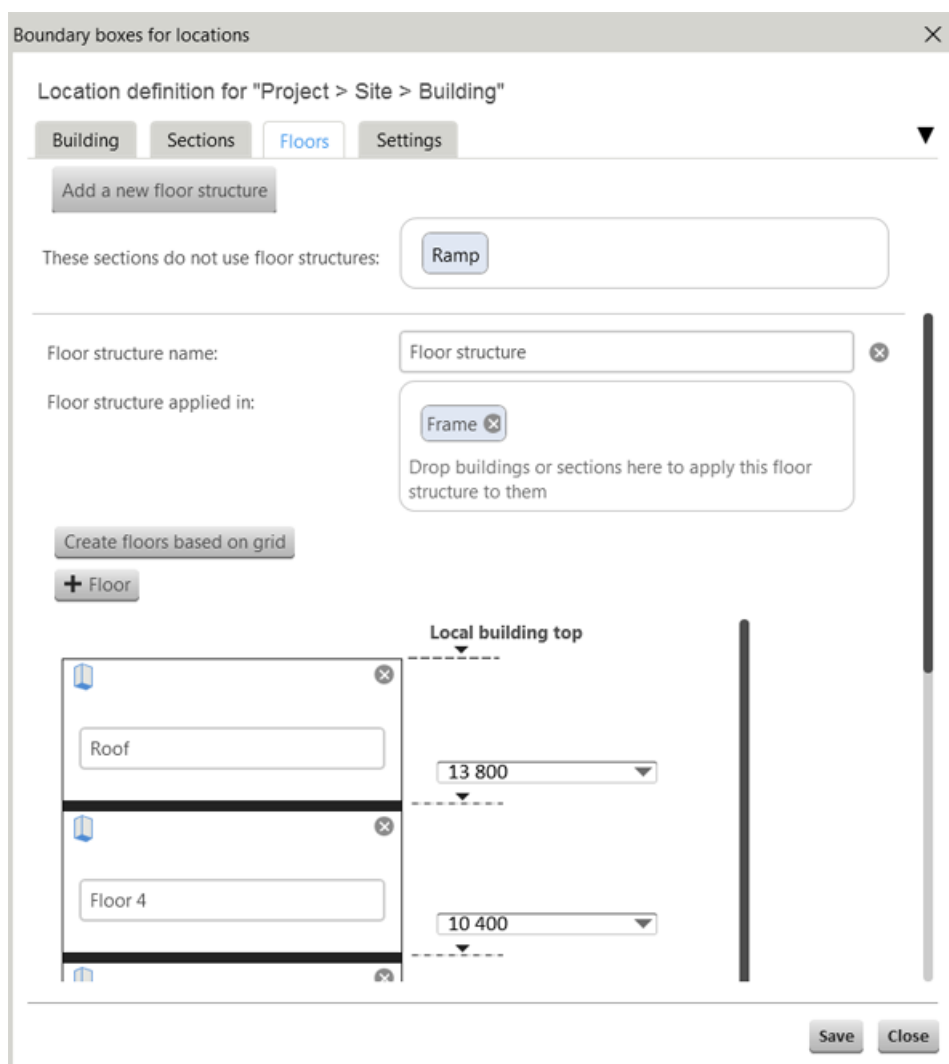
Section name	Local X Axis	Local Y Axis	Local Z Axis
Frame	-300	-300	-5 000
	36 500	30 250	20 000
Ramp	-300	30 250	-5 000
	36 500	37 300	3 600

Save Close

You can click the blue box in front of the section name to visualize the section in the model.



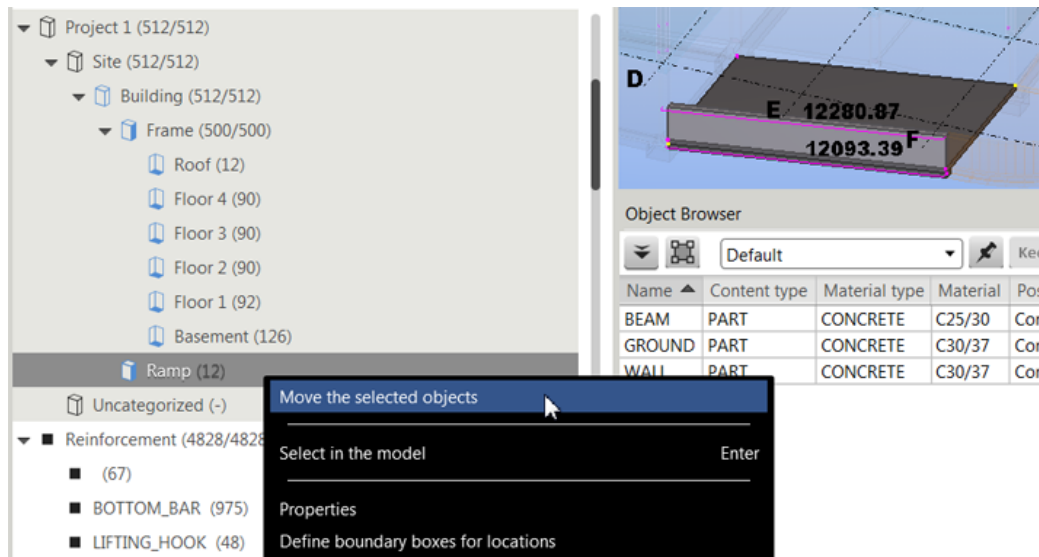
- Go to the **Floors** tab and create a floor structure for the **Frame** section based on the grid lines.



- Click **Save** and **Close**.

You have now organized the model to sections and floors based on locations as shown in the image below.

- There are three ramp objects that are located in the **Basement** of the **Frame** section. You have to move these manually to the **Ramp** section. To do this, select **Basement**, then select the objects in the model, right-click **Ramp** and select **Move the selected objects**.



You can now use these location categories to select and highlight assemblies, pour objects, cast units and reference model objects based on their location in the model.

Next, you will create the custom categories to easily create quantity take-off reports.

See also [Creating location categories in Organizer on page 50](#)  
[Modifying a category in Organizer on page 57](#)

## Creating a custom category with a tree structure based on object names in Organizer

You will now create a custom category for assemblies, and divide the category to subcategories based on the assembly name. This is phase 2 in the example workflow of [Example: Organizing the model into location and custom categories, and viewing quantities on page 71](#).

To create custom categories based on object names:

- Right-click the **New Category** and select **Properties**. Rename the category as **Object**.
- Select the **Include the highest assembly level in the model** check box. Click **Automated object content** and add the material filters for concrete and steel to the rules. If you use the standard filter, all objects in the model are selected. Use the **Default** property template for **Object Browser**.

Category Properties

Name:  (0)

>> New Category

Rules for setting category content

☒ Include the highest assembly level in the model

Automated object content

Select the model to automatically add objects to this category Model list


Add categories or filters to automatically add objects to this category. Object group...

☒ Update category at synchronization

Property template:

Delete Category Save Close

Selecting **Include the highest assembly level in the model** ensures that only assemblies and cast units are included in the category. Otherwise, the category will include both parts and assemblies. Using assemblies in categories is important because later you will select and view multiple different categories, and this will require using hierarchical dependencies for objects. Also, **Organizer** is built to work with assemblies.

3. Now create a tree structure for the category you created in the previous step. Create the tree based on the object names.
  - Select the **Object** category and go to **Object Browser**.
  - In **Object Browser**, click  and select **Grouping** to create a grouping based on the **Name** column. The grouping you see in **Object Browser** is a preview of the category tree.

Organizer

Object Browser

Default Keep Show from model Show from Categories

Tip: Drag columns here to form groups.

Content type	Material type	Material	Position number	Profile	Top level / m	Height / mm	Length / mm	Width / mm	Volume / m3	Weight / kg
▶ Name: BEAM (125)							634 077		143,5	3
▶ Name: COLUMN (95)							289 441		44,9	1
▶ Name: ELEVATED SLAB (5)							147 200		664,9	15
▶ Name: FASTENER (18)							900		0,0	
▶ Name: FOOTING (39)							132 427		32,7	
▶ Name: FOUNDATION SLAB (1)							2 350		2,5	
▶ Name: GROUND SLAB (7)							78 169		177,2	4
▶ Name: PARAPET (4)							37 900		18,8	
▶ Name: STAIRCASE SLAB (17)							53 930		16,6	
▶ Name: STAIRCASE WALL (26)										
Number of objects in the table: 399							Result of: Total	Of these rows: All		
							1 759 244		1 335,5	3 2

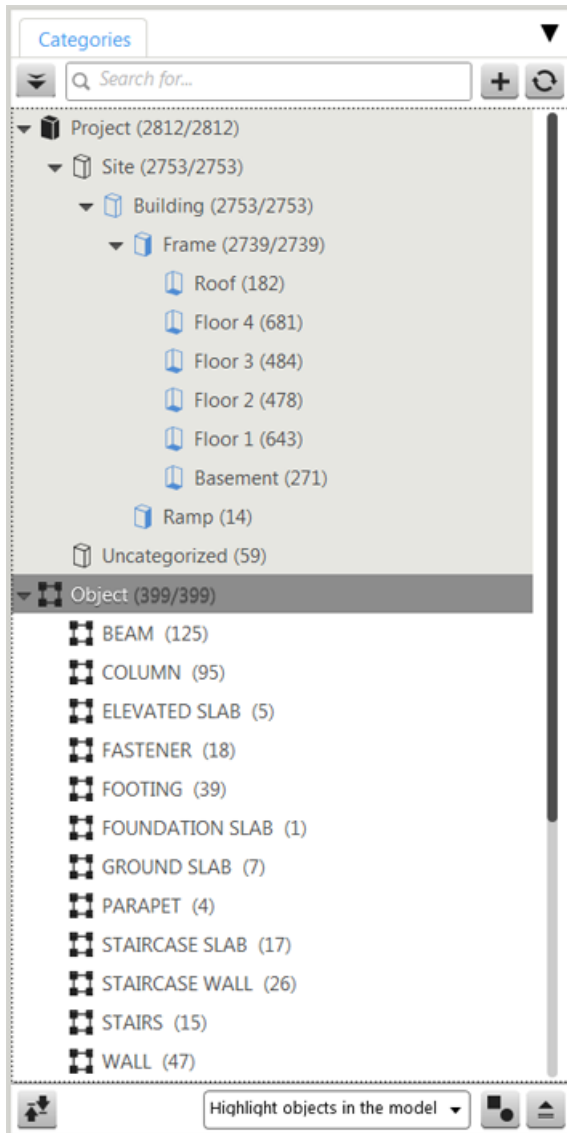
- Go back to the **Object** category, right-click and select **Create a tree by property**. Select **Grouping in Object Browser** from the list and click **Create**.

Create a category tree by property values

Grouping in Object Browser

Create Cancel

The tree structure is created under the **Object** category. If you now make changes to the model, the category and the tree will be updated. For example, new subcategories are created and old ones deleted based on the names found in the model.



Next, you will create a custom category for reinforcing bars.

**See also** [Creating automatic subcategories for a category using properties in Organizer on page 55](#)

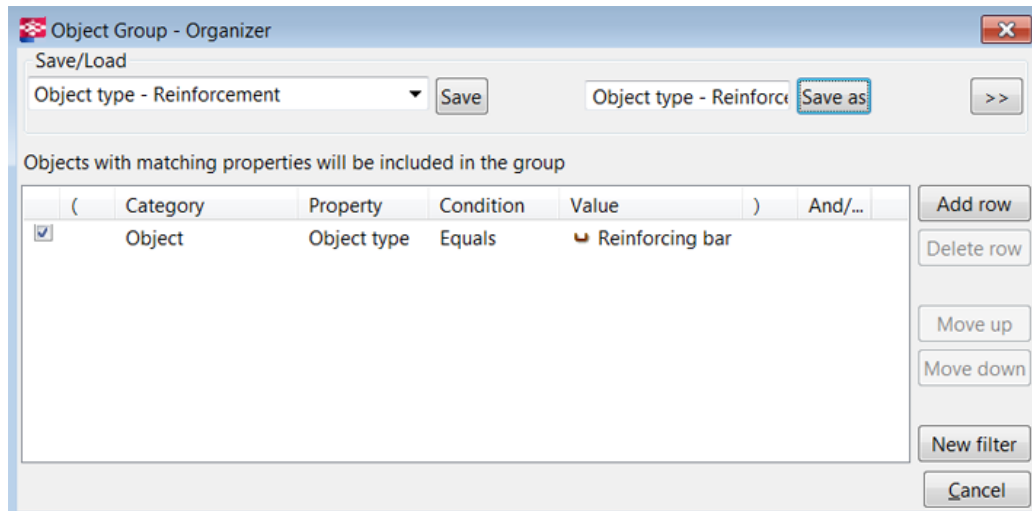
## Creating a custom category for reinforcing bars in Organizer

You will now create a custom category for reinforcing bars. This is phase 3 in the example workflow of [Example: Organizing the model into location and custom categories, and viewing quantities on page 71](#).

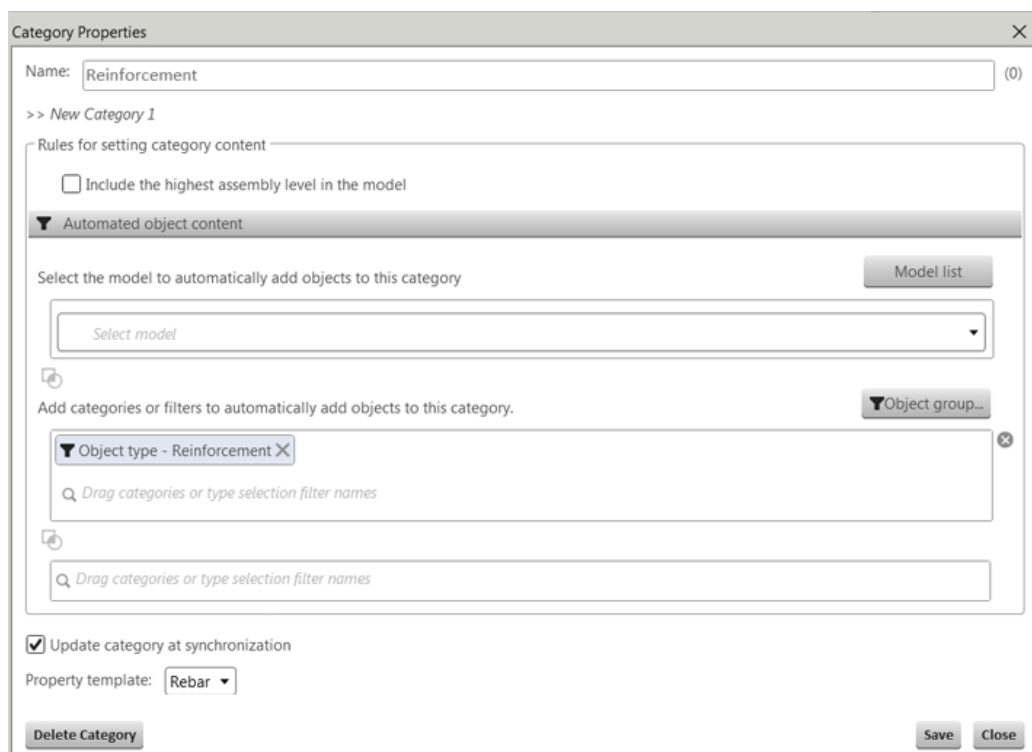
To create a custom category for reinforcing bars:

1. Create a new category and name it **Reinforcement**. Select to use the **Object type - Reinforcement** filter in the category property rules.

If you do not have a filter for reinforcement, click **Automated object content** --> **Object group** and create a filter as shown in the image below.



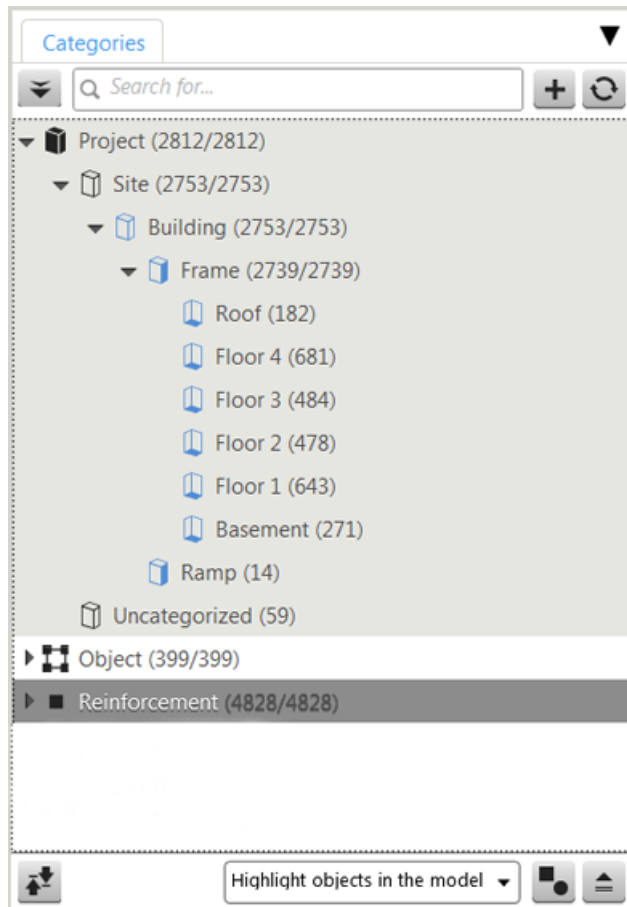
2. Select a property template for **Object Browser**. In this example, you select the **Rebar** template. For this category, do not select the **Include the highest assembly level in the model** check box. If you select to include only assemblies, you will get all assemblies that contain reinforcing bars. The highest assembly level for reinforcing bars is cast unit.



3. **Save and Close.**



Your categories are now as follows:



You have now created the categories you need and you can start creating reports.

Next, you will create a concrete quantity take-off and a reinforcing bar quantity take-off for specific objects in a specific location.



You can customize **Categories** to open with a set of default categories to avoid creating frequently used categories for each project. Export the desired categories to .xml file and save this .xml to your firm folder under \ProjectOrganizerData.

See also [Creating a custom category in Organizer on page 53](#)  
[Exporting a category from Organizer on page 67](#)

## Creating a concrete quantity take-off using Organizer

You will now get the quantities and formwork areas for the columns on the first floor. You need accurate quantities to order materials (formwork plywood and concrete), or just to plan

your work. This is phase 4 in the example workflow of [Example: Organizing the model into location and custom categories, and viewing quantities on page 71](#).

To create a concrete quantity take-off:

1. Select the **Floor 1** and **Column** categories.
2. Select a property template for quantity take-offs. **Object Browser** now shows the quantities of the columns on the first floor.

Organizer

Object Browser

Quantity takeoff

Keep

☒ Show from model

☒ Show from Categories

Tip: Drag columns here to form groups.

Name	Material	Profile	Length / mm	Volume / m3	Top level / mm	Section	Floor	Grid position
COLUMN	C30/37	400*400	3 200	0,5	3 400	Frame	Floor 1	3/F
COLUMN	C30/37	400*400	3 200	0,5	3 400	Frame	Floor 1	4/F
COLUMN	C30/37	400*400	3 200	0,5	3 400	Frame	Floor 1	5/F
COLUMN	C30/37	400*400	2 800	0,4	3 000	Frame	Floor 1	5/E
COLUMN	C30/37	400*400	2 800	0,4	3 000	Frame	Floor 1	3/E
COLUMN	C30/37	400*400	2 800	0,4	3 000	Frame	Floor 1	3/D
COLUMN	C30/37	400*400	2 800	0,4	3 000	Frame	Floor 1	3/C
COLUMN	C30/37	400*400	2 800	0,4	3 000	Frame	Floor 1	3/A
COLUMN	C30/37	400*400	2 800	0,4	3 000	Frame	Floor 1	4/A
COLUMN	C30/37	400*400	2 800	0,4	3 000	Frame	Floor 1	5/A
COLUMN	C30/37	400*400	2 800	0,4	3 000	Frame	Floor 1	6/A
COLUMN	C30/37	400*400	2 800	0,4	3 000	Frame	Floor 1	6/B
COLUMN	C30/37	400*400	2 800	0,4	3 000	Frame	Floor 1	6/C
COLUMN	C30/37	400*400	2 800	0,4	3 000	Frame	Floor 1	6/D
COLUMN	C30/37	400*400	2 800	0,4	3 000	Frame	Floor 1	5/D
COLUMN	C30/37	400*400	2 800	0,4	3 000	Frame	Floor 1	4/E
COLUMN	C30/37	400*400	2 800	0,4	3 000	Frame	Floor 1	4/D
COLUMN	C30/37	400*400	2 800	0,4	3 000	Frame	Floor 1	4/C
COLUMN	C30/37	400*400	2 800	0,4	3 000	Frame	Floor 1	4/B

Number of objects in the table: 19

Result of: Total

Of these rows: All

54 400

8,7

In this example, you have 19 columns with a total volume of 8.7 m<sup>3</sup>. You can now create a report by exporting, or you can just check the objects individually. Or, you can just use the total volume and call the concrete supplier to order the needed concrete to the site.

3. Select a property template for formwork. Using a different property template allows you to get different information on your selection.

Organizer

Object Browser

Formwork columns, walls and footings

Keep

Show from model Show from Categories

Tip: Drag columns here to form groups.

Name	Formwork area / m2	Section	Floor	Grid position
COLUMN	5,1	Frame	Floor 1	3/F
COLUMN	5,1	Frame	Floor 1	4/F
COLUMN	5,2	Frame	Floor 1	5/F
COLUMN	4,7	Frame	Floor 1	5/E
COLUMN	4,5	Frame	Floor 1	3/E
COLUMN	4,5	Frame	Floor 1	3/D
COLUMN	4,5	Frame	Floor 1	3/C
COLUMN	4,5	Frame	Floor 1	3/A
COLUMN	4,5	Frame	Floor 1	4/A
COLUMN	4,5	Frame	Floor 1	5/A
COLUMN	4,7	Frame	Floor 1	6/A
COLUMN	4,7	Frame	Floor 1	6/B
COLUMN	4,7	Frame	Floor 1	6/C
COLUMN	4,7	Frame	Floor 1	6/D
COLUMN	4,7	Frame	Floor 1	5/D
COLUMN	4,5	Frame	Floor 1	4/E
COLUMN	4,5	Frame	Floor 1	4/D
COLUMN	4,5	Frame	Floor 1	4/C
COLUMN	4,5	Frame	Floor 1	4/B

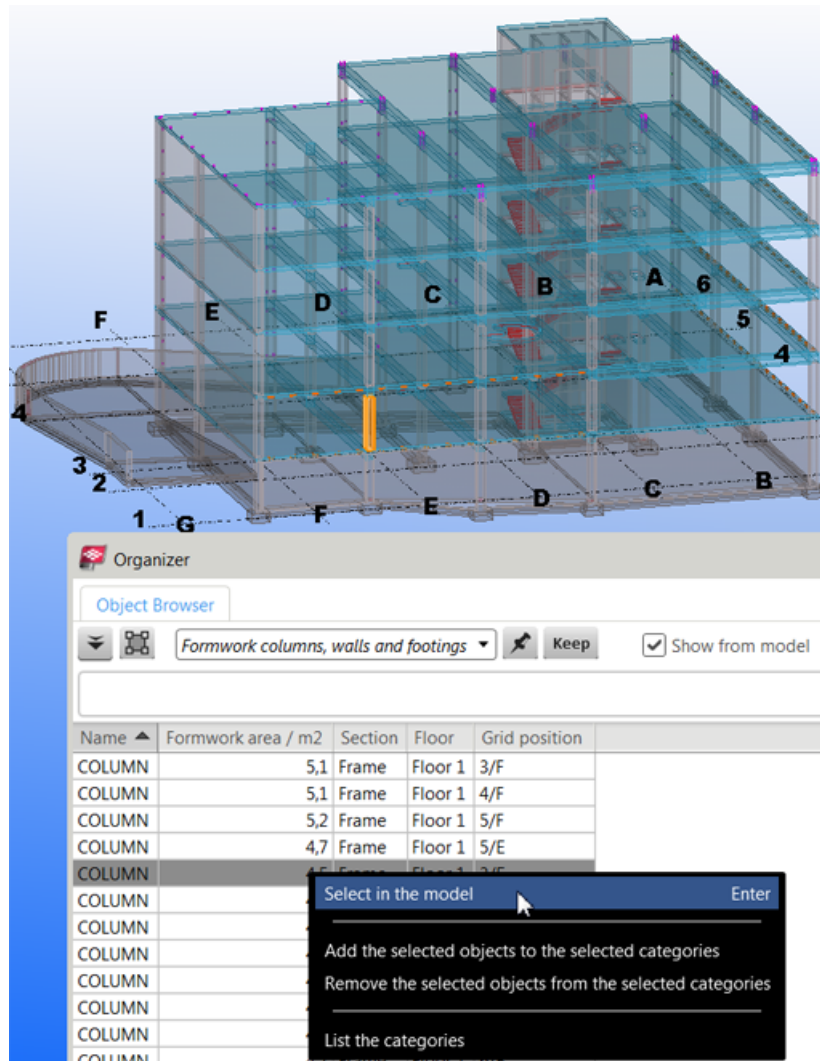
Number of objects in the table: 19

Result of: Total Of these rows: All

88,4

You now get the total formwork area for columns. You can also see the individual formwork area of each column.

- To check for discrepancies, you can select columns and locate them in the model for visual checking. Use **Ctrl+5** to highlight the selected, and **Ctrl+4** to remove the highlight.



Next, you will create a quantity take-off for the reinforcing bars in the first floor columns.


See also [Viewing object properties in Organizer on page 32](#)

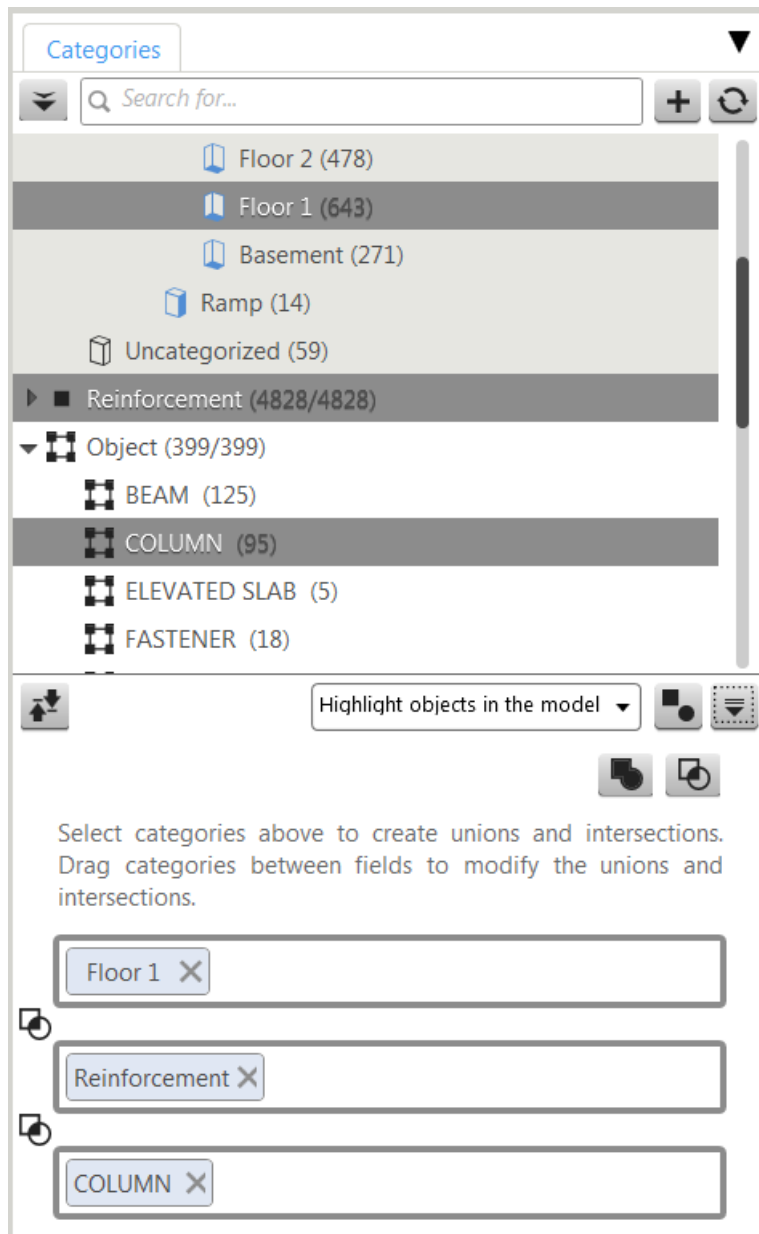
## Creating a reinforcing bar quantity take-off for first floor columns using Organizer

You will now get the quantities of the reinforcing bars of the columns on the first floor. This is phase 5 in the example workflow of [Example: Organizing the model into location and custom categories, and viewing quantities on page 71](#).

To create a reinforcing bar quantity take-off:

1. Select the **Floor 1** and **Reinforcement** categories, and the **Column** subcategory.

2. Click  to view the categories as unions and intersections in the selection pane, as shown in the image below. In this example, you need the intersections of the categories.



**Object Browser** shows the reinforcing bars that belong to the columns on the first floor using a combination of the property templates of all the selected categories. You can select a different property template to view other properties, and change the grouping and sorting of the properties.

Organizer

Object Browser

Combined template Keep Show from model Show from Categories

Size Tip: Drag columns here to form groups.

Name	Rebar shape	Grade	Quantity	Weight of single bar / kg	Weight of group / kg	Length / mm	Section	Floor	Content t
Size: 8 (57)			326,000	32,2	185,0	81 510			
Size: 25 (76)			76,000	1 167,4	1 167,7	303 000			
Number of objects in the table: 133 Result of: Total Of these rows: All									
			402,000	1 199,6	1 352,7	384 510			

You can change your category selection for different union and intersection combinations. For example, if you also want second floor columns, add **Floor 2** to the same box as **Floor 1** to get a union of the floors.

Highlight objects in the model

Select categories above to create unions and intersections. Drag categories between fields to modify the unions and intersections.

Floor 1 X Floor 2 X

Reinforcement X

COLUMN X

Drop the category here to create a new row.

- Click **Export** to create an excel file of your selection.

If you need the same report often, you can save your selection as a new category and set the desired template as the default property template. You can use categories in the rules to define the content of the new category. This is useful especially when you are building your model, and want to automatically include model changes in the category.

See also [Viewing object properties in Organizer on page 32](#)

[Creating a custom category in Organizer on page 53](#)  
[Exporting a category from Organizer on page 67](#)

## 2.15 Example: Tracking property based issues using Organizer

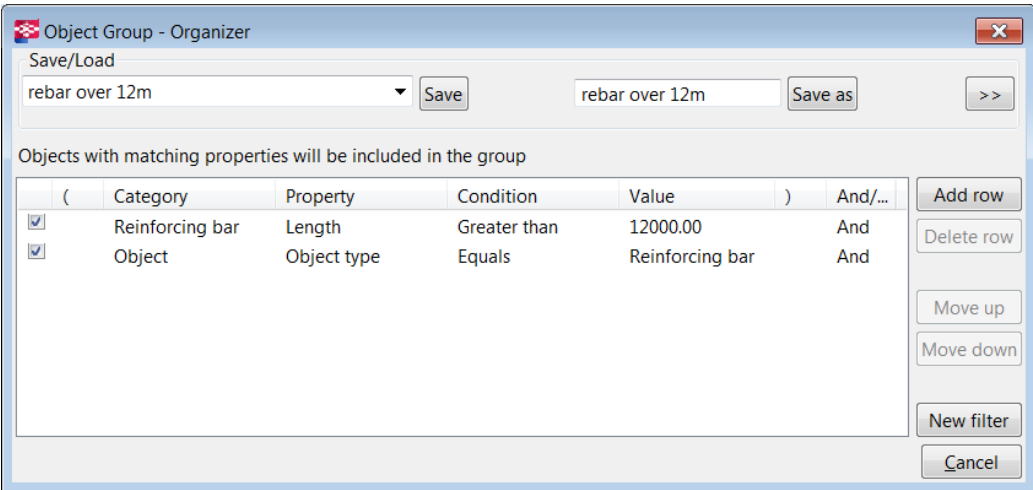
**See also** [Example: Tracking reinforcing bar length using Organizer on page 87](#)  
[Example: Tracking too heavy precast elements from a reference model using Organizer on page 92](#)  
[Example: Creating weight group categories to track different weights using Organizer on page 94](#)  
[Example: Tracking large concrete volumes using Organizer on page 95](#)

### Example: Tracking reinforcing bar length using Organizer

In this example, the maximum reinforcing bar length in your stock is 12 meters. All the reinforcing bars in your model should therefore be under 12 meters. You can use **Organizer** to track reinforcing bars that are longer than 12 meters.

To track reinforcing bars longer than 12 meters:

1. Create a new category and name it **Rebar length over 12 m** in **Category Properties**. Click **Automated object content** --> **Object group** to create a filter for the category and set it up as shown in the image below. The value is shown in millimeters.



2. Save the filter with a unique name using **Save as**.
3. In **Category Properties**, add the filter you created to the rule box, and an **Object Browser** property template if needed. Note that if you select the **Include the highest assembly level in the model** check box, you will get the assemblies and cast units that contain reinforcing bars longer than 12 meters.

Category Properties

Name:  (0)

>> New Category

Rules for setting category content

☐ Include the highest assembly level in the model

Automated object content

Select the model to automatically add objects to this category

Add categories or filters to automatically add objects to this category.

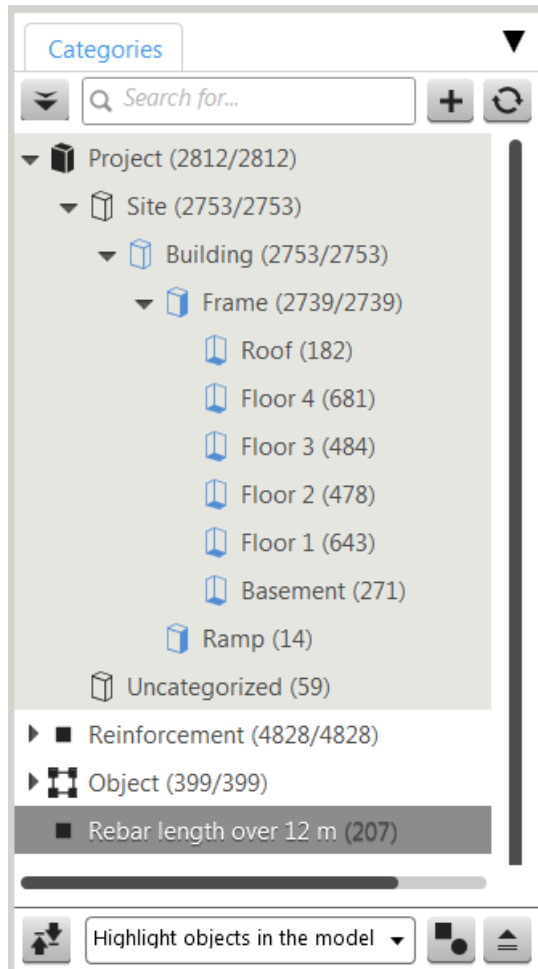
☒ Update category at synchronization

Property template:

4. Click **Save**.



The reinforcing bars that are longer than 12 meters are now included in the category. In this example, there are 207 reinforcing bars longer than 12 meters.



5. Select the category and view the content in **Object Browser**.

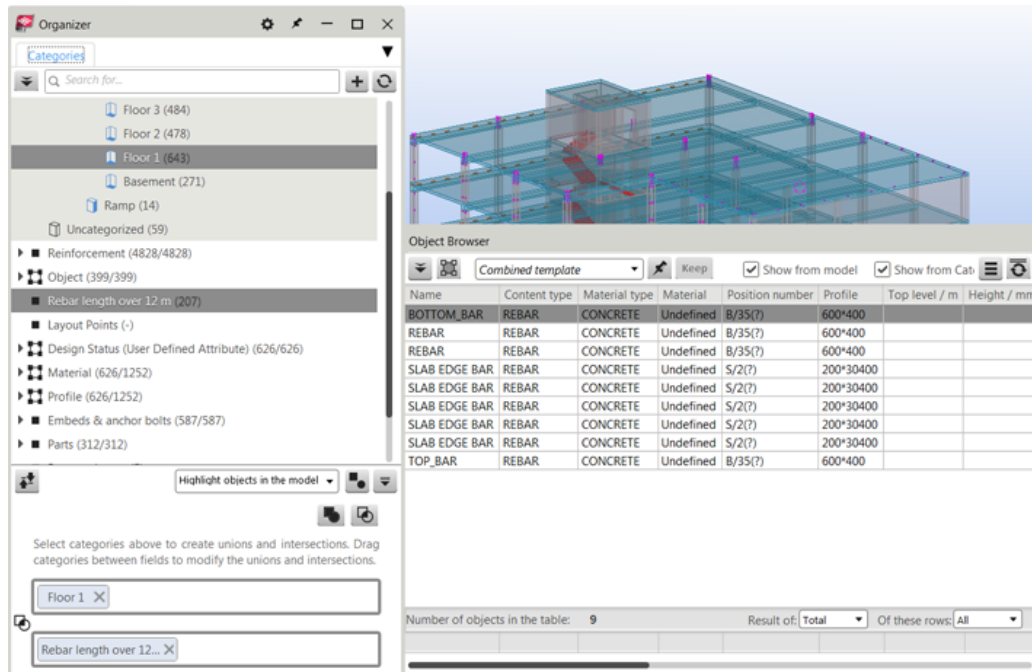
You can group the reinforcing bars in the category based on their length or location, for example. You can also select them in the model through category, or select them in the **Object Browser** listing and right-click to select them in the model.

Name	Size / mm	Rebar shape	Grade	Quantity	Weight of single bar / kg	Weight of group / kg	Length / mm	Section
BOTTOM_BAR	8	1	Undefined	1	7,0	7,0	17 830	Frame
BOTTOM_BAR	8	1	Undefined	1	7,0	7,0	17 830	Frame
BOTTOM_BAR	8	1	Undefined	1	7,0	7,0	17 830	Frame
BOTTOM_BAR	8	1	Undefined	1	7,0	7,0	17 830	Frame
BOTTOM_BAR	8	1	Undefined	1	7,0	7,0	17 830	Frame
BOTTOM_BAR	8	1	Undefined	1	7,0	7,0	17 830	Frame
BOTTOM_BAR	8	1	Undefined	1	7,0	7,0	17 830	Frame
BOTTOM_BAR	8	1	Undefined	1	7,0	7,0	17 830	Frame
BOTTOM_BAR	8	1	Undefined	1	7,0	7,0	17 830	Frame
BOTTOM_BAR	8	1	Undefined	28	7,0	196,3	17 750	Frame
REBAR	8	1	Undefined	2	5,8	11,5	14 560	Ramp
REBAR	8	1	Undefined	2	5,8	11,5	14 560	Ramp
REBAR	8	1	Undefined	2	5,2	10,5	13 270	Frame
REBAR	8	1	Undefined	1	5,7	5,7	14 350	Frame
REBAR	8	1	Undefined	1	5,7	5,7	14 350	Frame
REBAR	8	1	Undefined	1	5,7	5,7	14 350	Frame
REBAR	8	1	Undefined	1	5,7	5,7	14 350	Frame
REBAR	8	1	Undefined	1	5,7	5,7	14 350	Frame
REBAR	8	1	Undefined	1	5,7	5,7	14 350	Frame
SLAB EDGE BAR	8	1	Undefined	2	7,2	14,5	18 300	Frame
SLAB EDGE BAR	8	1	Undefined	2	7,2	14,5	18 320	Frame
SLAB EDGE BAR	8	1	Undefined	2	10,1	20,1	25 500	Frame
SLAB EDGE BAR	8	1	Undefined	2	12,0	24,0	30 320	Frame
SLAB EDGE BAR	8	1	Undefined	2	4,9	9,9	12 500	Frame
SLAB EDGE BAR	8	1	Undefined	2	4,9	9,9	12 500	Frame

Number of objects in the table: 207      Result of: Total      Of these rows: All


1 719	577,000	1 526,6	4 385,1	3 434 170
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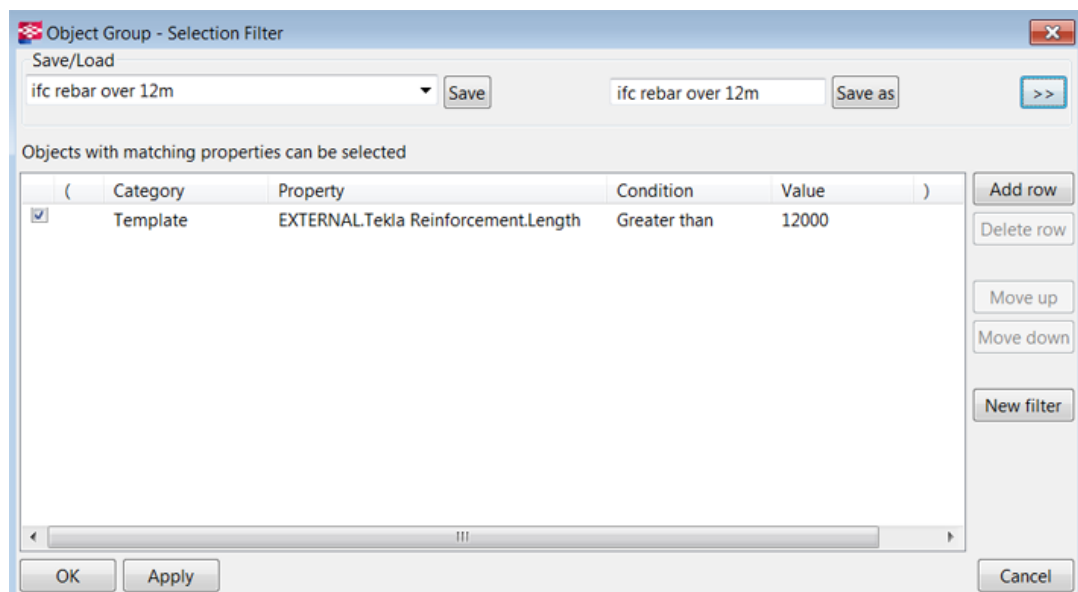
- Before your first floor will go to fabrication, you may want to do a final check. You can select the **Floor 1** and **Rebar length over 12 m** categories to check if there are any reinforcing bars that are too long on the first floor. In this example, there are 9 such bars.



## Other possible use cases

You can also check reference models that contain reinforcing bars. In this example, the IFC model has been created with Tekla Structures.

- First, create a filter as shown in the image below. Click  to set the filter type to **Organizer**.
- Then, create a new category using this filter.
- Ensure that your reference model is subdivided to be able to include reference objects to categories.





If you have a reference model that has been created with some other software, an easy way to find out the string for the filter is to use the **Inquire** command. Select an object and right-click. Find the desired value string from the **Inquire** dialog box, and copy and paste the value as a property to the filter dialog box, and add `EXTERNAL.` in front of the property name.

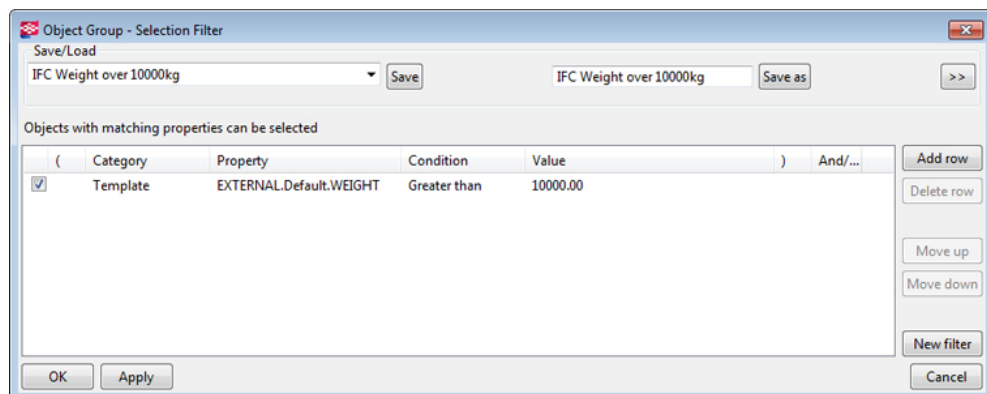
See also [Example: Tracking property based issues using Organizer on page 87](#)  
[Organizer on page 31](#)

## Example: Tracking too heavy precast elements from a reference model using Organizer

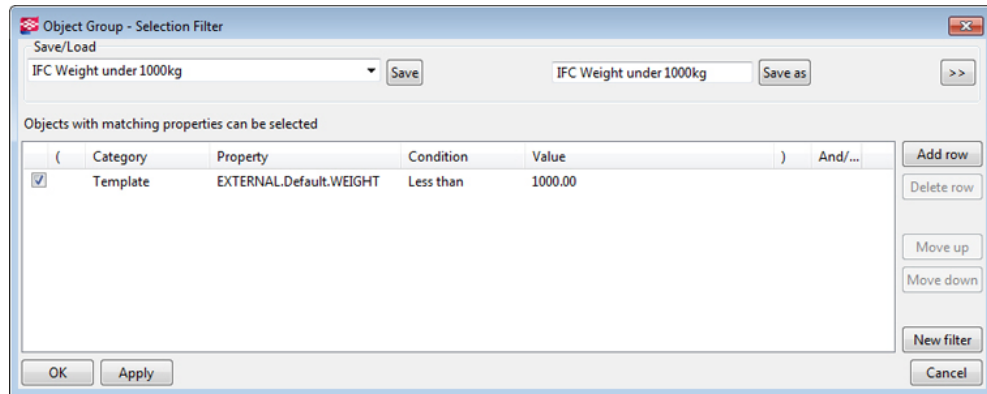
The Cast in Place Sample model used in this example includes three reference models with precast elements.

To track precast element weights:

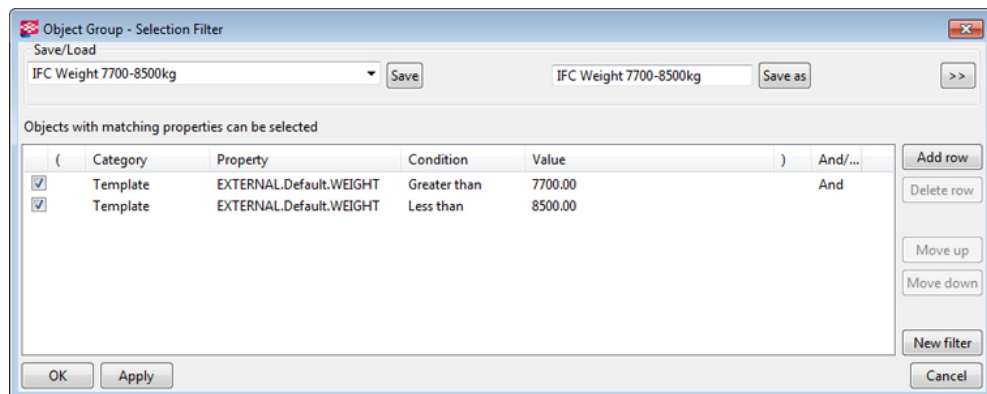
1. Create a new category.
2. Create filters to track precast element weights.
  - Create a filter to track a weight over 10 tonnes.



- Create a filter to track a weight under 1 tonne.

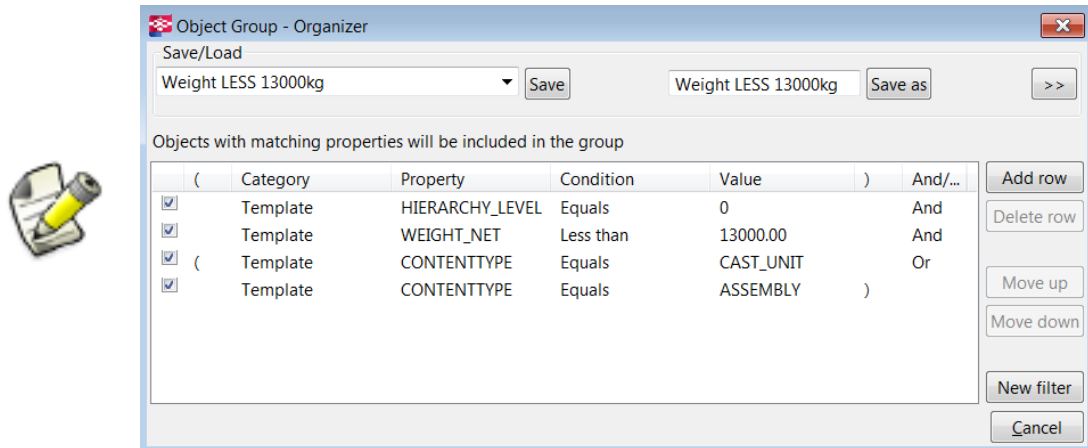


- Create a filter to track a weight within a certain limit.



3. When you have created the category and the filters, add a suitable filter to the category property rules and save the category.

You can also use this similar process with Tekla Structures objects, for example, to track both steel assembly and cast unit weights with one filter. Here is an example of such a filter:



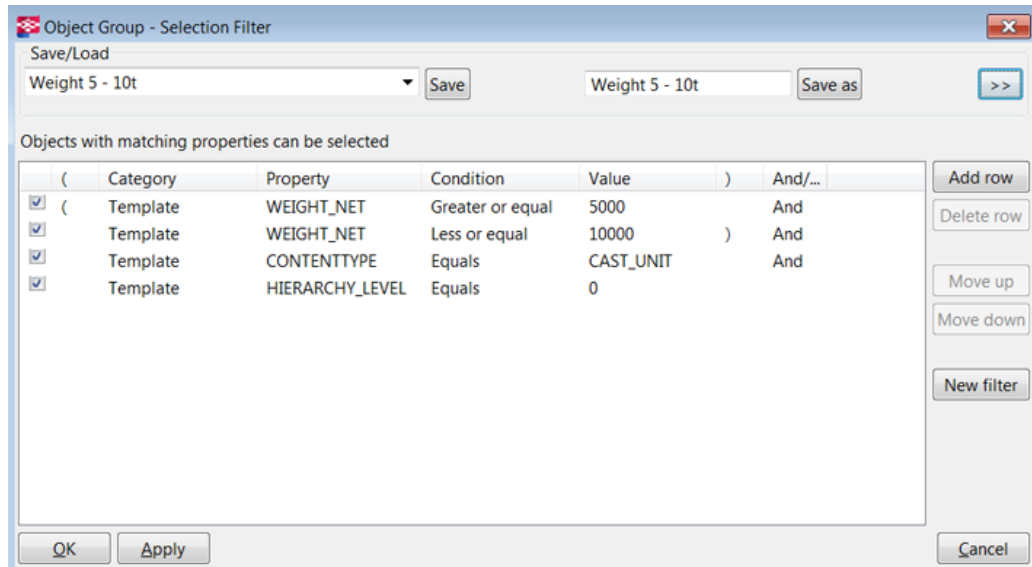
This filter selects all steel assemblies and concrete cast units that are under 13 tonnes. The hierarchy level attribute is needed to get the main assembly weight.

See also [Example: Tracking property based issues using Organizer on page 87](#)  
[Organizer on page 31](#)

## Example: Creating weight group categories to track different weights using Organizer

To create weight groups for tracking different weights:

1. Create a suitable filter to create categories for weights, for example, Weight 5 – 10t as shown in the image below. Click  to set the filter type to **Organizer**.



2. You can now create categories for the weight intervals and track locations. You can use the categories like other categories, for example, you could track first floor weights. You can also use the same logic with other properties, such as volume, length, and area. Adjust the filter rules depending on what you want to track.



See also [Example: Tracking property based issues using Organizer on page 87](#)  
[Organizer on page 31](#)

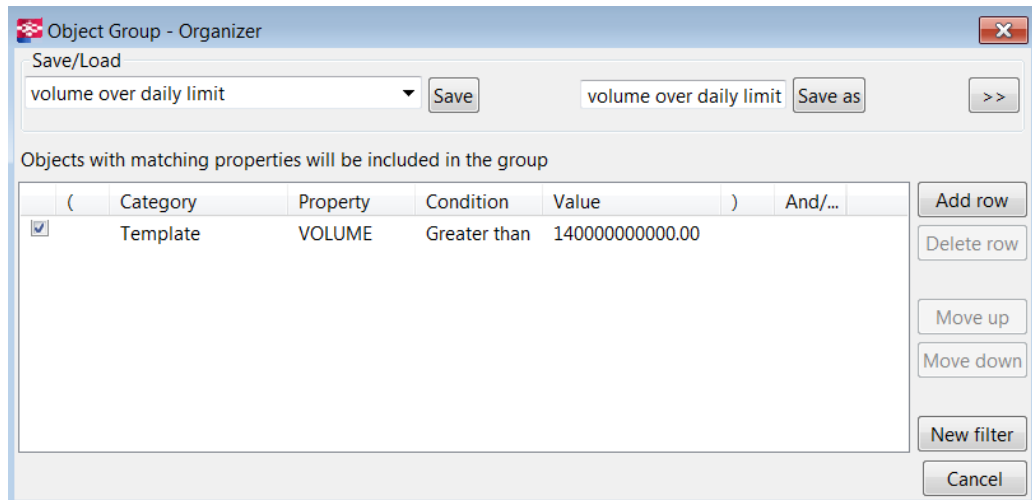
### Example: Tracking large concrete volumes using Organizer

It may sometimes happen that the volumes in the model accidentally exceed certain limits. Such limits could be the daily pour rate and delivery rate. You can use **Organizer** to track the limits.

To track a limit:

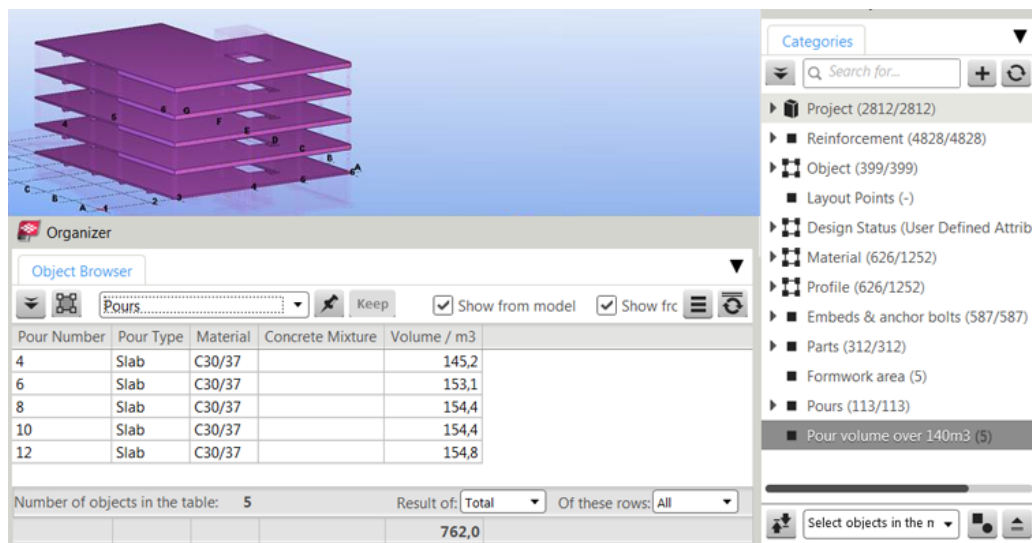
1. Create a new category and name the category as **Pour volume over 140m3**.
2. In **Category Properties**, click **Automated object content --> Object group** to create a filter for selecting volumes larger than the daily delivery maximum and set it up as

shown in the image below. In this example, the daily delivery limit is 140 m<sup>3</sup>. The unit is mm<sup>3</sup>.



3. Add the filter you created in the category rules and select the **Include the highest assembly level in the model** check box. Save the category properties.

Note that if you are doing this with pour objects as shown in the image below, use a pour object filter and do not select the **Include the highest assembly level in the model** check box.



You can now start planning based on the result. For example, you may need a bigger crane, or maybe the elements should be smaller. Perhaps the four pours you have should be divided into smaller pours, or maybe you need more concrete delivered to the site.

See also [Example: Tracking property based issues using Organizer on page 87](#)  
[Organizer on page 31](#)



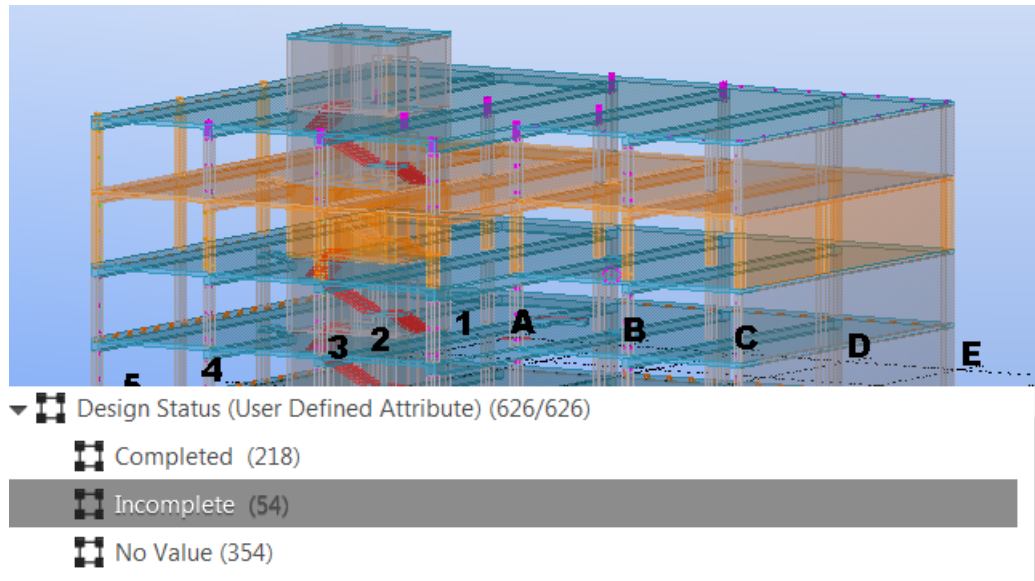
## 2.16 Example: Creating a custom category for structural design status in Organizer

To create a custom category for structural design status:

1. Click **Tools** --> **Organizer**.
2. Create a new category, right-click the category and select **Properties**. Enter **Design Status (User Defined Attribute)** as the name of the category.
3. Set the category rules to create automatic categories using the **Create a tree by property** command based on the design status that has been assigned for each model part under the UDA.

The screenshot shows the 'Category Properties' dialog box for a category named 'Design Status (User Defined Attribute)'. The dialog is titled 'Category Properties' and has a close button (X) in the top right corner. The 'Name' field contains 'Design Status (User Defined Attribute)' and a count '(626)'. Below the name, there is a section for 'Rules for setting category content'. The first rule is 'Include the highest assembly level in the model', which is checked. Below this is a section for 'Automated object content'. It includes a 'Model list' button and a 'Select model' dropdown menu. There is also an 'Object group...' button. Below the 'Object group...' button is a search bar with the text 'Drag categories or type selection filter names'. The next section is 'Automated subcategories'. It contains a text box with the text 'Object properties used to create a tree under "Design Status (User Defined Attribute)" ...'. Below this text box are several property names in a list: 'MAINPART.PLANS\_STATUS', 'UDA - PLANS\_STATUS', 'ASSEMBLY.MAINPART.PLANS\_STATUS', 'CAST\_UNIT.MAINPART.PLANS\_STATUS', and 'PLANS\_STATUS'. These are separated by 'OR' labels. At the bottom of the dialog, there is a checkbox for 'Update category at synchronization' which is checked. Below this is a 'Property template' dropdown menu set to 'Default'. At the very bottom, there are three buttons: 'Delete Category', 'Save', and 'Close'.

You can now use the categories in managing the structural design status of your project.



See also [Example: Creating a custom category for architectural design status in Organizer on page 98](#)

[Organizer on page 31](#)

## 2.17 Example: Creating a custom category for architectural design status in Organizer

Your design team may want to communicate the design status of the parts in their model to ensure that other project members only focus on areas where the design has reached maturity.

To create a custom category for architectural design status:

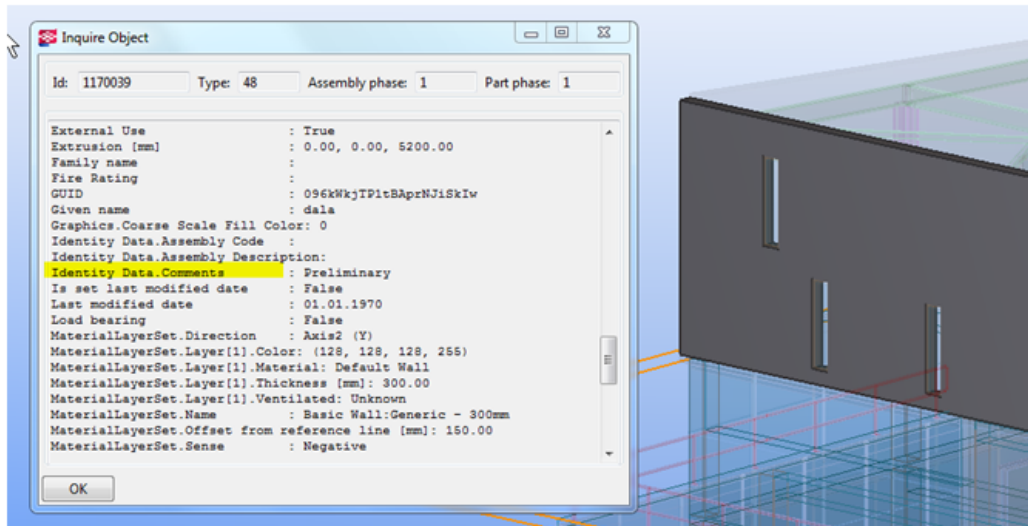
1. Ensure that the architectural team places an IFC attribute to each object, such as `Architectural_Status`, which can be included in the IFC file that they share. In ArchiCAD, this can be done by simply adding an IFC property to the objects called, for example, `Status`. In Revit, this can be done by using the Revit comment attribute found on each Revit Family Instance.
2. In Tekla Structures, use the **Add Model** command to place the architectural IFC model in the correct location and ensure that the model is subdivided.
3. Click **Tools --> Organizer**.
4. Create a new category, right-click the category and select **Properties**. Enter **Architectural\_Status** as the category name.
5. Add the **Object type - Reference Object** filter to the rule box, or a locally set filter that will find all reference objects in the model.


Add categories or filters to automatically add objects to this category.

▼ Object type - Reference object X

Q Drag categories or type selection filter names

6. Create a new property to allow Tekla Structures to read comments from the ArchiCAD / Revit IFC file. To find the name used by the IFC file, select an IFC object, right-click and select the **Inquire** command. Find the property name and copy it.



7. Create a new property template. Open **Settings**  and click **Template**. Select to create a blank template and enter **Arch\_Comments\_attribute** as the name of the new template. Save the template.

8. In **Settings**, create a new property.

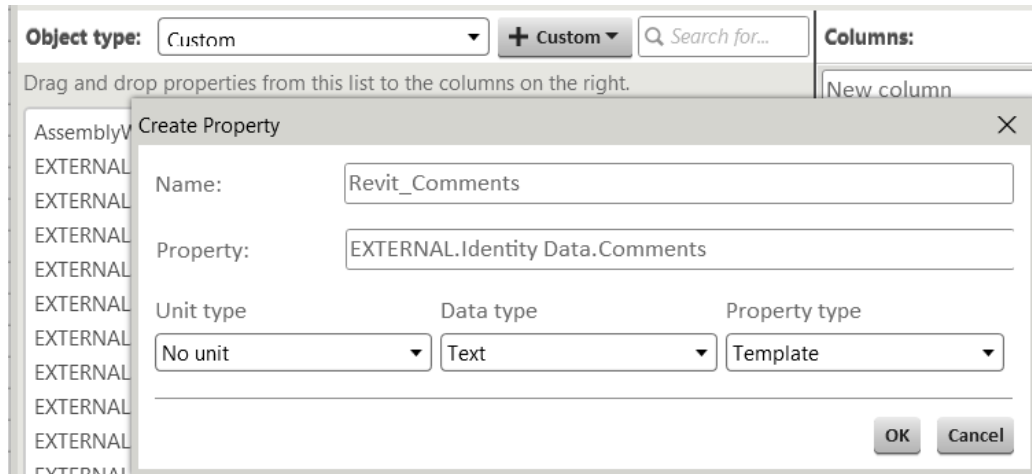
- Select **Custom** from the **Object type** list.
- Then click the **Custom** button and select **Property**.

In this example, you will add a Revit\_Comments property.

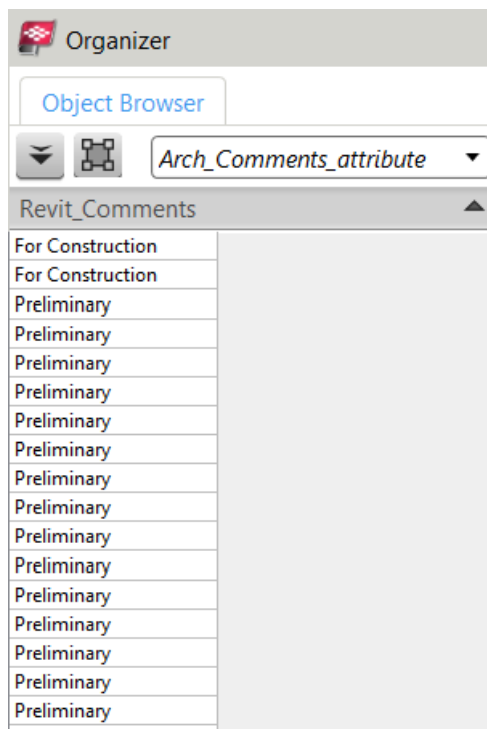
- Enter the word **EXTERNAL.** in capital letters to the beginning of the property name in the **Property** box, then paste or write the property you copied in the **Inquire** dialog box.

For example, as taken from the step above, the correct notation would be **EXTERNAL.Identity Data.Comments.**

- Click **OK**, add the new property to the new template, click **Keep**, and close **Settings**.



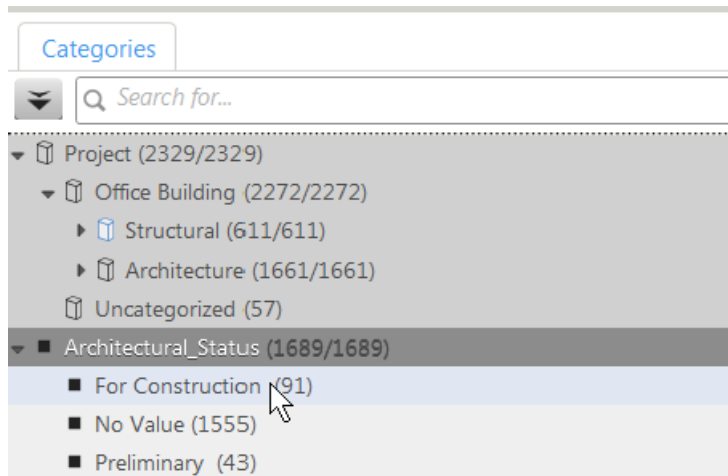
With the Revit IFC objects selected, **Object Browser** now shows the following:



9. Select the **Architectural\_Status** category. Ensure that **Object Browser** is showing the **Arch\_Comments\_attribute** grouping information. Right-click the **Architectural\_Status** category and select **Create a tree by property** to create a category tree using the property values. Create the tree using the grouping in **Object Browser**. Click **Create**.



The categories are now as follows:



You can now automatically track the status of architectural IFC objects in the Tekla Structures model.


See also [Organizer on page 31](#)

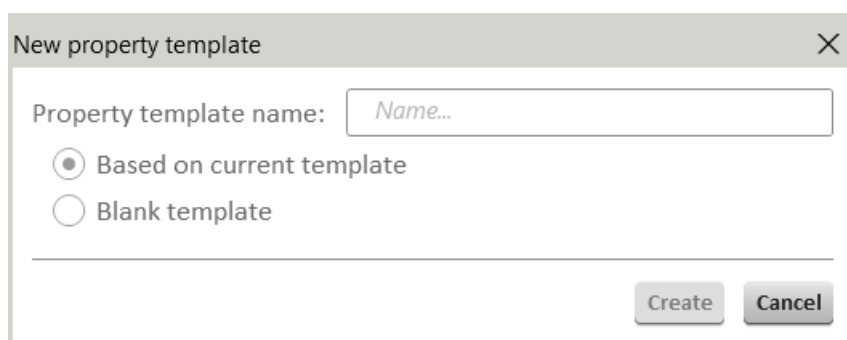
[Example: Creating a custom category for structural design status in Organizer on page 97](#)

## 2.18 Example: Organizer for steel – managing bolts

You can use **Organizer** to quickly get the quantities of the bolts required for a project. In addition to the raw quantities, **Object Browser** lets you group and sub-total by bolt standard, diameter, and length as well as by where the bolt will be used (shop or site).

To manage bolts using **Organizer**:

1. Click **Tools** --> **Organizer** .
2. Click **Settings**  .
3. Click **Template** to create a new template. Enter **Bolt summary** as the template name, select the **Blank template** option, and click **Create** to create the new template.



4. Next, select **BOLT** from the **Object type** list and from the available properties in the list drag the following properties to the **Columns**:

- **TYPE** - The bolt standard (for example, 7990, A325, F10T).
- **DIAMETER** - The nominal diameter of the bolt.
- **LENGTH** - The nominal length of the bolt.
- **SITE\_WORKSHOP** - Where the bolt is to be used.
- **NUMBER** - The number of bolts in the bolt group.

Clear the **Show result in sum row** check box for **DIAMETER** and **LENGTH**.

You can also add **CONTENTTYPE**, which shows the type of the object that is being reported in a row. This is useful for checking the results and identifying when something other than a bolt is being reported.

Columns: +

TYPE
▲ Ascending
×

☐ Show result in sum row  
☐ Show result in combined rows

TYPE ×

DIAMETER
▲ Ascending
Unit
×

☐ Show result in sum row  
☐ Show result in combined rows

DIAMETER ×

LENGTH
▲ Ascending
Unit
×

☐ Show result in sum row  
☐ Show result in combined rows

LENGTH ×

SITE\_WORKSHOP
▲ Ascending
×

☐ Show result in sum row  
☐ Show result in combined rows

SITE\_WORKSHOP ×

NUMBER
▲ Ascending
×


☒ Show result in sum row  
☒ Show result in combined rows

NUMBER ×


CONTENTTYPE
▲ Ascending
×

☐ Show result in sum row  
☐ Show result in combined rows

CONTENTTYPE ×

5. Click **Keep** to save your changes and close the **Settings** dialog box.
6. Select some bolts (and optionally other objects as well) in the model.
7. Click  to reload the view in **Object Browser** to ensure that the latest information is shown and verify that the bolt information is correctly reported. At this point, you could edit your **Bolt summary** template further to add additional information, such as the main part phase, or create a custom property to calculate and report the weight of the bolts, nuts, and washers in the bolt group.

Next, you can use **Object Browser** to summarize the bolt quantities in your selection.

8. Click  in **Object Browser** and select **Grouping**.
  - a. Drag the **Type** column to the grouping row.  
You now have a summary of the different types of bolts used in your selection.
  - b. Drag the **Diameter** column and then the **Length** column to the right side of **Type** in the grouping row.  
**Object Browser** now gives you a breakdown of the number of bolts first by type, then by diameter, and then by length.

You could now also drag the **SITE\_WORKSHOP** column at the end of the grouping row to further break down the bolts by location, or drag the column to the beginning of the grouping row to first break down the bolts by location, then by type, diameter, and length. Other properties could also be used to group and summarize the bolts.

9. Customize the template and grouping to suit your needs and click the **Keep** button to save the template. Now you can use the grouping of your template to categorize all the bolts in the model.
10. Next, create a new custom category, right-click the category and select **Properties**. Enter **Bolts** as the name of the category.
11. Define the properties of the category as follows:
  - a. Ensure that the **Include the highest assembly level in the model** check box is not selected.
  - b. Click **Automated object content**.
    - Click in the rule box for categories and filters, and select the **Object type - Bolt** filter from the list of filters. Note that the **Object type - Bolt** filter selects all bolt group objects including the ones that create only bolt holes as well as studs.
  - c. Ensure that the **Update category at synchronization** check box is selected.
  - d. Select the **Bolt summary** property template from the **Property template** list.
  - e. Click **Save**.



All bolt objects in the model are now added to the category. In **Object Browser**, the properties of the bolts are shown using the **Bolt summary** template.

You can now automatically categorize all the bolts in the model using the same breakdown as in the bolt summary.

12. Right-click the **Bolts** category and select **Create a tree by property**.

13. Click in the search box and select **Grouping in Object Browser**.

14. Click **Create**.

You now have a **Bolts** category which is broken down into a tree based on the grouping in your **Bolt summary** template. If any changes are made to the model, you can simply synchronize this category to automatically update the breakdown. New bolts will be found and added to the correct subcategories, or a new subcategory will be created if necessary. For example, if a new bolt standard or diameter is added to the model, a new subcategory for that bolt standard or diameter will automatically be created in the tree when you synchronize the **Bolt** category with the model.

You could now export the **Bolt summary** property template, as well as the **Bolts** category for use in other projects.

See also [Example: Organizer for steel – managing assemblies on page 105](#)  
[Organizer on page 31](#)

## 2.19 Example: Organizer for steel – managing assemblies

The categories in **Organizer** can help manage the amount of work for a project by breaking down the assemblies by phase and assembly type. This can help in estimating the amount of work required to detail and/or fabricate the project even before the model has been detailed.


This example assumes that the model has been divided into two or more phases using **Phase Manager**. The model could be a design model with no detailing, or it could be a fully detailed model.

To manage assemblies using **Organizer**:

1. Click **Tools --> Organizer**.
2. Create a new custom category, right-click the category and select **Properties**. Enter **Assemblies by phase** as the name of the category.
3. Define the properties of the category as follows:
  - a. Ensure that the **Include the highest assembly level in the model** check box is selected.
  - b. Click **Automated object content**.
  - c. Click the **Select model** list and select **Tekla Structures model** to avoid getting any reference model assemblies to the category.
  - d. Ensure that the **Update category at synchronization** check box is selected.

- e. Select the **Erection** property template from the **Property template** list.
- f. Click **Save**.

The steel assemblies in the model are now added to the category and their erection information is shown in **Object Browser**.

4. Next, click  in **Object Browser** and select **Grouping**:
  - a. Drag the **Phase** (or **Phase Name**) column to the grouping row.
  - b. Drag the **Name** column to the grouping row.

You can further group by any additional properties you would like to use to break down the work of each phase.

5. Right-click the **Assemblies by phase** category and select **Create a tree by property**.
6. Click in the search box and select **Grouping in Object Browser**.
7. Click **Create**.

You now have the **Assemblies by phase** category broken down into a tree by phase, then by name.

This now gives you a breakdown of the number and kinds of assemblies in each phase, which can be used to quickly estimate the amount of work in each phase. As the model is detailed or changes are made to the project, you can simply synchronize this category to automatically update the breakdown. This could be used to track and check the workload of each phase against production capacity or available resources as the project progresses.

Once detailing has started, the **DrawingsFromModel Object Browser** property template could be used to check the availability and status of drawings for assemblies in each phase.

See also [Example: Organizer for steel – managing bolts on page 101](#)


## 2.20 Example: Organizer for precast

You can use **Organizer** to view the properties of model objects, for example, based on custom and standard property types.

To view model objects based on custom properties:

1. Click **Tools** --> **Organizer**.
2. Create delivery lot categories `DeliveryLot_1...n`.
3. Add sequences to the objects in cast units using **Task Manager** or the **Sequencer** tool.

For example, if you use the **Sequencer** tool, enter a `sequence name` as the sequence property. The sequence could be the installation sequence. You can check that the property exists by using the **Inquire Object** command.

4. Click **Settings**  in **Organizer**.
5. Create a new property template for cast units.
6. Create a custom property for the sequence property:
  - a. Set the **Data type** to **Number without decimals**.
  - b. Set the **Property type** to **UDA**.

You can use the **Inquire Object** command to find the sequence property. Copy and paste the property to the **Create Property** dialog box in **Organizer**.

7. Add the custom property as a new property column to the new property template.
8. Set the sorting of the custom property column.
9. Save the template.
10. Close the **Settings**.
11. Sort the cast units based on the sequence property in **Object Browser**.
12. Select the cast units that have the same sequence property.
13. Select **Selected** from the **Of these rows** list at the bottom in **Object Browser**.
14. Select an option from the **Result of** list, for example, to show the total or average weight of the selected cast units.
15. Select a delivery lot category in **Categories** and add the selected cast units to the category.
16. Select the **Select objects in the model** option from the list at the bottom in **Categories**.
17. Export the selected cast units from **Object Browser** to an `.xml` file.

See also [Organizer on page 31](#)

Sequencer on page 152

# 3 Task Manager

Task Manager is a tool for contractors, sub-contractors, and project managers. Task Manager allows you to incorporate time-sensitive data into 3D Tekla Structures models and to control the schedule at various stages and levels of detail throughout the project.

With Task Manager, you can create, store and manage scheduled tasks, and link the tasks to their corresponding model objects. On the basis of the tasks, you can create customizable model views and comprehensive 4D simulations of the progression of the project.

You can create tasks interactively or by importing tasks from external project management tools such as Microsoft Office Project or Primavera P6. The import functionality allows you to preserve any schedules that you have created outside the model environment, and thereby maintain schedule intelligence and organization. You can supplement imported schedules with more detail in Task Manager.

The above workflow matches what can be found in a normal project delivery – an increasing awareness of activities that support higher level project objectives and milestones. Task Manager gives you a logical storage space for this information, and helps you extend schedule control into powerful 3D representations.

## 3.1 Task Manager user interface

This section introduces the Task Manager user interface and explains how to run commands in Task Manager.


Click the links below to find out more:

- [Starting Task Manager on page 109](#)
- [Task list on page 110](#)
- [Gantt chart on page 110](#)
- [How to run commands on page 111](#)

## Starting Task Manager

To start Task Manager, click **Tools --> Task Manager...** .

## Task list

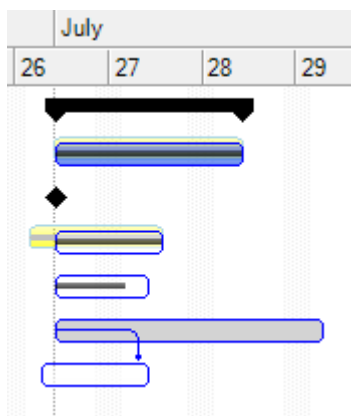
The task list contains all the tasks included in the current Tekla Structures model and shows the properties of each task. If the task list is not visible in Task Manager, click  > **Task List**. The default task list that opens depends on the Tekla Structures environment and contains recommended settings. You can modify and delete the default tasks if needed.

See also [Modifying a task on page 118](#)  
[Showing and hiding task list items on page 112](#)

## Gantt chart

The Gantt chart shows the timescale of the project. If the Gantt chart is not visible, click










 > **Gantt Chart**.



See also [Gantt chart symbols on page 110](#)  
[Modifying Gantt chart appearance on page 113](#)

## Gantt chart symbols

The following symbols are used in the Gantt chart:

Symbol	Description
	Task that is not linked to any model object.
	Planned start and end dates.
	Actual start and end dates.
	Completeness of the task.
	Summary task. Summary tasks can contain other summary tasks as subtasks.
	Dependency between tasks.
	Milestone.
	Locked task. The task is marked as locked  in the task list.

See also [Adding objects to a task on page 128](#)

[Creating a subtask on page 116](#)

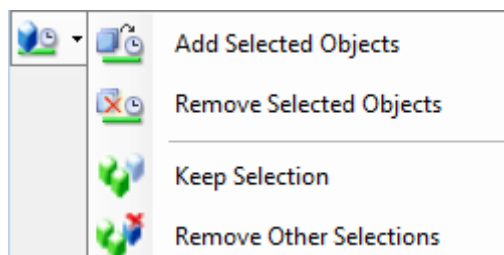
[Task dependencies on page 125](#)

[Defining general task properties on page 118](#)

## How to run commands

To run a command in Task Manager, do one of the following:

- Click the appropriate button. If the button contains more than one command, click the button and then select a command from the pop-up menu that appears:



- In the task list or Gantt chart, select the task you want to modify; then right-click and select a command from the pop-up menu.

See also [Selecting multiple tasks in the task list on page 137](#)  
[Selecting multiple tasks in the Gantt chart on page 137](#)

## 3.2 Changing view settings

This section explains how to change some general view settings in Task Manager.

Click the links below to find out more:

- [Enlarging icons on page 112](#)
- [Showing and hiding task list items on page 112](#)
- [Keeping Task Manager window on top on page 113](#)
- [Modifying Gantt chart appearance on page 113](#)
- [Modifying Gantt chart timescale on page 113](#)
- [Modifying Gantt chart colors on page 114](#)
- [Modifying the appearance of dates and months on page 114](#)

### Enlarging icons


You can enlarge the icons in Task Manager by using the **Large Icons** option.

To enlarge the icons, click  > **Large Icons**.

### Showing and hiding task list items

You can define which task list items are visible.

To show or hide task list items:

1. Click  > **Task List Items**.
2. Click any of the task list items to show or hide them.

A check mark  in front of the item indicates that the item is visible.


When you open Task Manager the next time, the selections you made in the previous Task Manager session are in use.

See also [Task list on page 110](#)







## Keeping Task Manager window on top


You can have Task Manager always stay on top of other windows on the screen by using the **Stay On Top** option.

To keep Task Manager on top of other windows, click  > **Stay On Top**.

## Modifying Gantt chart appearance

To modify the appearance of the Gantt chart:

To	Do this
Show or hide the name of the contractor assigned to the task	Click  > <b>Gantt Chart Settings &gt; Contractors</b> .
Show or hide non-working days	Click  > <b>Gantt Chart Settings &gt; Non-Working Days</b> .
Show or hide the actual start and end dates	Click  > <b>Gantt Chart Settings &gt; Actual Dates</b> .  Note that you must define the actual start and end dates in the task list to be able to show them in the Gantt chart.
Show or hide the planned start and end dates	Click  > <b>Gantt Chart Settings &gt; Planned Dates</b> .


A check mark  in front of the option indicates that it is visible.

See also [Gantt chart on page 110](#)  
[Gantt chart symbols on page 110](#)

## Modifying Gantt chart timescale

You can change the timescale in the Gantt chart and zoom to selected tasks.

To modify the timescale of the Gantt chart, do one of the following:

- Click  and select the timescale option:
  - Days/Hours

- Weeks/Days
- Months/Weeks
- Quarters/Months
- Years/Quarters
- Fit to the project

**Fit to the project** automatically selects the appropriate timescale option to show the whole project schedule in the Gantt chart.

- On the Gantt chart, hold down the right mouse button.
  - To make the timescale wider, for example from weeks to months, drag the mouse to the right.
  - To make the timescale narrower, for example from weeks to days, drag the mouse to the left.



To zoom to a task in the Gantt chart, select a task and press **Ctrl + 1**.

To zoom back to the whole scenario, press **Ctrl + 2**.

To place the Gantt chart symbol of the selected task in the middle of the chart, press **Ctrl + 3**.

---


**See also** [Gantt chart on page 110](#)

[Gantt chart symbols on page 110](#)

## Modifying Gantt chart colors

You can change the colors of Gantt chart symbols for tasks linked to the model, tasks not linked to the model, and actual dates.

To modify the colors of Gantt chart symbols:

1. Click  > **Set Colors....**
2. Click the color you want to change.
3. Select a color in the **Color** dialog box.
4. Click **OK** to close the dialog box.

**See also** [Gantt chart on page 110](#)

[Gantt chart symbols on page 110](#)

## Modifying the appearance of dates and months

Task Manager shows the dates and months as defined in the Windows regional and language settings.

To change how dates and months are shown:

1. Click the Windows **Start** button.
2. Click **Control Panel**.
3. Go to **Regional and Language Options** and select the format you want to use.
4. Click **OK**.
5. Restart Tekla Structures for the change to take effect.

See also [Task list on page 110](#)

[Gantt chart on page 110](#)

[Modifying Gantt chart appearance on page 113](#)

## 3.3 Creating and modifying tasks

This section explains how to create, modify and remove tasks.

Click the links below to find out more:

- [Creating a task on page 115](#)
- [Creating a subtask on page 116](#)
- [Defining a task type on page 116](#)
- [Defining a contractor on page 117](#)
- [Modifying a task on page 118](#)
- [Saving a task on page 124](#)
- [Removing a task on page 124](#)


### Creating a task

Each new task must have at least a name and a planned timeline. You can also define other properties such as a task type, a contractor responsible for the task, and the actual timeline for completing the task, and link the task to model objects.

To create a new task, do one of the following:

- In Tekla Structures, select one or more model objects, then right-click and select **Task --> Create Task** from the pop-up menu.

The task is automatically linked to the selected model objects.

- In Task Manager, click  .

You can now link the task to one or more model objects.

- In the Gantt chart, right-click and select **Create task** from the pop-up menu.



If the task list already contains tasks, Task Manager uses the properties of the selected task as a basis when creating new tasks.

If the newly created task is not shown in Task Manager, click anywhere in the task list to update the view.

See also [Modifying a task on page 118](#)

[Adding objects to a task on page 128](#)

[Importing and exporting tasks on page 131](#)

## Creating a subtask

To create a subtask:


1. In the task list, select the task under which you want to create a subtask.

2. Click  .

## Defining a task type

You can create new task types, and rename and remove existing task types. You can also define a production rate for a task type and link the task type to user-defined attributes.

To define a task type:

1. Select a task in the task list.
2. Right-click and select **Task Information....**
3. On the **General** tab, click the  button next to the **Task type** box.
4. Click **Add** to add a new task type.
5. Enter a name for the task type.

To rename a task, select the task and click **Rename**. Then enter the new name.

6. Define a production rate for the task type.
  - a. Select a task type unit.

The default task type units are report properties that are listed in the `WorkTypeProperties.xml` file. The file is located in the model folder and it is created when you first open Task Manager. The report properties included in the file depend on the Tekla Structures environment. To change a task type unit or add new task types edit the `WorkTypeProperties.xml` file.

You can add Tekla Structures report properties, reference model properties and calculations to the file. The display name is shown in the **Units** column and the report property name value is used in Task Manager. If you are adding a calculation, the property type must be `calc`.

The default units of the task type units depend on the settings in **Tools --> Options --> Options --> Units and decimals**.

- b. Define the quantity.
- c. Define the time.
7. Select object UDAs from the lists to create a link between the task type and the objects that will belong to the task.
8. Click **Modify** to apply the changes.
9. Click **OK** to close the dialog box.



To remove a task type, select the task type and click **Remove**.

---

**See also** [Linking a task to user-defined attributes on page 130](#)

[Defining a production rate for a task on page 122](#)

[Managing individual objects in a task on page 120](#)


[Importing task types on page 132](#)

[Exporting task types on page 133](#)

## Defining a contractor

You can add new contractors, and rename and remove existing contractors.

To define a contractor:

1. Click  > **Contractors....**
2. Click **Add** to add a new contractor.
3. Enter the name of the contractor.

To rename a contractor, select the contractor and click **Rename**. Then enter the new name.

4. Click **Modify** to apply the changes.
5. Click **OK** to close the dialog box.



To remove a contractor, select the contractor and click **Remove**.

---

## Modifying a task

To modify an existing task:

1. Select a task in the task list.
2. Right-click and select **Task Information...** to display the current properties of the task.

If you have selected multiple tasks, only the common basic properties are shown in the dialog box. The properties that have different values are shown as <Not equal>.

The units depend on the settings in **Tools --> Options --> Options --> Units and decimals**.

3. Modify the task properties.  
The options that appear dimmed cannot be modified. Task Manager selects or clears these check boxes automatically depending on the task properties.
4. Click **Modify** to apply the changes.
5. Click **OK** to close the dialog box.



Alternatively, you can modify tasks directly in the task list. Click the property you want to modify and enter a new value. With some task properties you need to select the value from a list.

---

**See also** [Defining general task properties on page 118](#)  
[Defining a task schedule on page 119](#)  
[Managing individual objects in a task on page 120](#)  
[Selecting multiple tasks in the task list on page 137](#)

### ***Defining general task properties***

You can define general properties, such as a name, task type, dependency, and contractor for a task.

To define general task properties:

1. Select a task in the task list.
2. Right-click and select **Task Information....**
3. Enter a name for the task.
4. Mark the task as a milestone task by selecting the check box.  
Task Manager selects this check box automatically if you set the task duration to zero.
5. Define the dependency.
  - a. **Successor moved only forward** moves the dependent task forward only when the preceding task is moved forward. If the preceding task is moved to an earlier date, the dependent task is not moved.
  - b. **Successor moved always when predecessor moved** moves the dependent task in the same direction as the preceding task, according to the dependency type and possible lag time.
6. Select the task type.
7. Select the contractor.
8. Click **OK** to close the dialog box.

**See also** [Defining a task schedule on page 119](#)  
[Managing individual objects in a task on page 120](#)  
[Tracking a task schedule on page 123](#)  
[Task dependencies on page 125](#)

### ***Defining a task schedule***

You can plan a schedule for a task by defining the start date and the end date. You can define both the start and the end date, or enter the start date and length and allow Task Manager to calculate the end date.

Before you define the planned schedule, make sure that you have defined the needed general properties for the task.

To define a task schedule:

1. Select the task in the task list.
2. Right-click and select **Task Information... --> Scheduling**.
3. Select the scheduling mode.


- **Fixed start and end**

Adding objects to the task or removing objects from the task changes the production rate but keeps the task length as it is.

- **Fixed start**

Adding objects to the task or removing objects from the task changes the task length.


4. Enter the planned start date.
5. Enter the planned end date.
6. If needed, enter the planned length of the task.

**Shift** is a working day, defined in  > **Non-working Periods** > **Set working day**.

7. If needed, define the work duration in hours in the **Fixed start** mode.
8. Click **Modify** to apply the changes.

Task Manager calculates the total workload, production rate and work duration of the task.


9. Click **OK** to close the dialog box.

10. To check that the dates of subtasks are within the summary task dates, click  > **Check Dates**.

Conflicting dates are shown in red in the task list.



You can also modify the length of the task in the Gantt chart. Place the mouse pointer over the edge of the task bar in the Gantt chart. The mouse pointer changes into a double-ended arrow. Hold down the left mouse button, and then drag the edge to the right or to the left.

You can modify the start dates of the whole project at one go. Click  > **Change Project Start Date** and select a new start date.

See also [Tracking a task schedule on page 123](#)

### ***Managing individual objects in a task***

You can manage the planned and actual dates, and the duration of the activities related to each object in a task.






Make sure that you have defined task types and linked them to user-defined attributes for planned and actual dates.

---

To manage planned and actual dates of individual objects in a task:

1. Select a task in the task list.
2. Right-click and select **Task Information....**
3. On the **General** tab, select a task type in the **Task Type** list.
4. On the **Tracking** tab, select **Linked to objects** in the **Tracking mode** list to use the schedule and completeness information calculated from the individual objects in the task.
5. On the **Objects** tab, click the  function button to calculate the dates for the objects in the task.

The dates are also shown in the user-defined attributes in the part properties dialog box. If you change the dates of an object in the model, refresh the task in Task Manager to ensure the changed dates are shown in Task Manager.

---



If you link an object to a user-defined attribute, we recommend that you keep the object within one scenario. If the dates in a task change, the user-defined attribute dates change as well. The changed dates are then used in all the scenarios the object belongs to.

---

6. Click **Modify** to apply the changes.
  7. Click **OK** to close the dialog box.
- 



To calculate the dates for several tasks at one go, select the tasks in the task list and click



---

**See also** [Defining a task type on page 116](#)  
[Linking a task to user-defined attributes on page 130](#)  
[Defining the order of objects in a task on page 121](#)

### ***Defining the order of objects in a task***

You can define and save the order in which objects are stored in tasks.

To define the order of objects in a task:

1. Select a task in the task list.
2. Right-click and select **Task Information...** --> **Objects**.
3. Define the order of objects belonging to the task in any of the following ways:
  - a. Drag the objects in the list manually to the desired order.  
The selected objects are highlighted in the list during the dragging.
  - b. Click a column heading to sort the objects.  
The order column shows the saved order of the objects.
  - c. Select the objects in the list, click **Select order from model**, and in the model, click the objects in the desired order.

You can use all of the above when defining the order within one task.

4. To show the order information in the model, do the following:
  - a. On the **Objects** tab, select one or more objects.
  - b. Press **Ctrl + D**.  
The order information is shown on the selected objects in the model. For example, 2-1 means the object belongs to the second task in the task list and that it is the first object in the task.
  - c. To clear the numbers from the model, right-click and select **Update Window**.



When you define the cast-in-place work order or work groups within a task, the **Custom Inquiry** tool is useful for planning the appropriate quantities for each group or lot.


---

See also [Managing individual objects in a task on page 120](#)

### ***Defining a production rate for a task***

You can define a production rate for tasks. First, define a production rate for a task type and then assign the task type to a task.

To define a production rate for a task:

1. Click  > **Task Types....**
2. Select a task type in the list.  
If the task list is empty, click **Add** to enter a new task type.
3. Select a unit in the **Unit** column for calculating the production rate.


The default unit is **PIECES**.

The units depend on the settings in **Tools --> Options --> Options --> Units and decimals**.


4. Enter the quantity and time.

By default, quantity and time is units per one hour. However, you can set the time to be, for example, the length of the working shift.

5. Click **OK** to close the **Task Types** dialog box.
6. In the task list, select the task type for the task.
7. Click the task list to show the rate in the **Planned Production Rate** column.

8. To show the overall quantity for a task, click  > **Task List Items > Quantity**.

For example, you can show the number of objects or the size of an area linked to the task.

9. To show the actual production rate in the task list, click  > **Task List Items > Actual Production Rate**.



If you change the duration of the task, the production rate is changed. Also, if you change the production rate, the duration of the task is changed.

---

See also [Defining a task type on page 116](#)

### ***Tracking a task schedule***

You can track how a task is progressing by defining the actual schedule and task completeness information.

Make sure that you have defined the needed general information, planned schedule and object information for the task.

To track a task schedule:

1. Select a task in the task list.
2. Right-click and select **Task Information...** --> **Tracking**.
3. Select the tracking mode.
  - a. **Manual** allows you to enter the actual start and end dates, and task completeness information.
  - b. **Linked to objects** shows the schedule and completeness information calculated from the individual objects in the task. You do not need to define any information on the **Tracking** tab.
4. Define the actual start date.

5. Define the actual end date.
6. Optional: Define the actual length of the task.  
Defining the actual length affects the actual end date.
7. Define the completed workload.
8. Define the actual production rate.
9. Define the actual work duration.
10. Click **Modify** to apply the changes.
11. Click **OK** to close the dialog box.

**See also** [Defining general task properties on page 118](#)  
[Defining a task schedule on page 119](#)  
[Managing individual objects in a task on page 120](#)

### ***Defining additional information for a task***

You can define additional information for a task, such as links to web pages, relevant documents, project schedules, and contracts.

To define additional information for a task:

1. Select a task in the task list.
2. Right-click and select **Task Information...** --> **Additional Information**.
3. If needed, add a link to a document in the **Documents** box. Click the **Add** button, select the link to be added, and click **Open**.  
To remove a link, select it in the **Documents** box and click **Remove**.
4. If needed, enter additional notes in the **Notes** box.
5. Click **Modify** to apply the changes.
6. Click **OK** to close the dialog box.

**See also** [Modifying a task on page 118](#)

## **Saving a task**

When you save the model in Tekla Structures, the related tasks are automatically saved with the model. You do not need to save the tasks separately when exiting Task Manager.

## Removing a task

To remove a task:

1. Select a task in the task list.
2. Right-click and select **Delete**.
3. Click **Yes** to confirm.

See also [Selecting multiple tasks in the task list on page 137](#)

## 3.4 Managing task dependencies

This section explains how to create dependencies between tasks.

Click the links below to find out more:

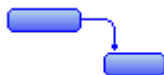
- [Task dependencies on page 125](#)
- [Creating a dependency between tasks on page 126](#)
- [Modifying a dependency between tasks on page 127](#)
- [Removing a dependency between tasks on page 128](#)

### Task dependencies

A task can be dependent on another task or a milestone. For example, you can define that Task1 must be completed five days before Task2 can be started. Tasks can be dependent on one another in four different ways:

- **Finish-to-Start (FS)**: The preceding task must finish before the dependent task can start.
- **Start-to-Start (SS)**: The preceding task must start before the dependent task can start.
- **Finish-to-Finish (FF)**: The preceding task must finish before the dependent task can finish.
- **Start-to-Finish (SF)**: The preceding task must start before the dependent task can finish.

The dependencies are represented by arrows in the Gantt chart. The arrow points to the start or the end of the other task, depending on their relationship.



A predecessor is a task that must be completed before the dependent task. It is not possible to create circular dependencies in Task Manager.

You can define whether the dependent task is always moved when the preceding task is moved or whether the dependent task is only moved forward when the preceding task is moved forward.

**See also** [Creating a dependency between tasks on page 126](#)  
[Modifying a dependency between tasks on page 127](#)  
[Removing a dependency between tasks on page 128](#)  
[Defining general task properties on page 118](#)

## Creating a dependency between tasks

Use the **Dependencies** tab in the **Task Information** dialog box to create dependencies between tasks. You can create dependencies for one task at a time. If you select more than one task, the **Dependencies** tab is not shown.

To create a dependency between tasks:

1. Select a task in the task list.
2. Right-click and select **Task Information...** --> **Dependencies** .
3. Select the preceding task from the **Task Name** list.  
You cannot select the summary task of the current task, or a task that already has a dependency with the current task.
4. Select a dependency type from the **Type** list. The options are:
  - **Finish-to-Start (FS)**: The preceding task must finish before the dependent task can start.
  - **Start-to-Start (SS)**: The preceding task must start before the dependent task can start.
  - **Finish-to-Finish (FF)**: The preceding task must finish before the dependent task can finish.
  - **Start-to-Finish (SF)**: The preceding task must start before the dependent task can finish.
5. If you want to add a delay between the tasks, enter a value in the **Lag** list.  
Define the value on a scale of 1 to 100. The time unit of the delay is always **Days**.
6. Go to the **General** tab.
7. Define in **General properties** --> **Dependency** the direction the dependent task is moved to when the preceding task is moved.
8. Click **OK** to save.



Alternatively, drag a task bar onto another task bar in the Gantt chart to create a basic Finish-to-Start dependency with no lag time.

See also [Task dependencies on page 125](#)

## Modifying a dependency between tasks

Use either the **Dependencies** tab in the **Task Information** dialog box or right-click a dependency in the Gantt chart to modify a dependency. You can modify the dependency for one task at a time. If you select more than one task, the **Dependencies** tab is not shown.

Do one of the following:

To	Do this
Modify a dependency in the <b>Task Information</b> dialog box	<ol style="list-style-type: none"><li>1. Select a task in the task list.</li><li>2. Right-click and select <b>Task Information...</b> --&gt; <b>Dependencies</b>.</li><li>3. Select the preceding task from the <b>Task Name</b> list.</li><li>4. Select the dependency type from the <b>Type</b> list.</li><li>5. If needed, change the delay between the tasks by entering a new value (days) in the <b>Lag</b> list.</li><li>6. Click <b>Modify</b> to apply the changes.</li><li>7. If needed, go to the <b>General</b> tab, <b>General properties</b> --&gt; <b>Dependency</b> and define the direction to which the dependent task is moved when the preceding task is moved.</li><li>8. Click <b>OK</b> to close the dialog box.</li></ol>
Modify a dependency in the Gantt chart	<ol style="list-style-type: none"><li>1. In the Gantt chart, right-click a dependency.</li><li>2. Select the dependency type on the pop-up menu.</li><li>3. If needed, enter a new lag value (days) and press the <b>Enter</b> key.</li></ol> <p>The changed dependency is immediately visible in the Gantt chart.</p>

See also [Task dependencies on page 125](#)

## Removing a dependency between tasks

Use either the **Dependencies** tab in the **Task Information** dialog box or right-click a dependency in the Gantt chart to remove a dependency.

Do one of the following:

To	Do this
Remove a dependency in the <b>Task Information</b> dialog box	<ol style="list-style-type: none"><li>1. Select a task in the task list.</li><li>2. Right-click and select <b>Task Information... --&gt; Dependencies</b>.</li><li>3. Select the task and click <b>Remove</b>.</li></ol>
Remove a dependency in the Gantt chart	<ol style="list-style-type: none"><li>1. In the Gantt chart, right-click a dependency.</li><li>2. Select <b>Delete</b> on the pop-up menu.</li></ol>

See also [Task dependencies on page 125](#)

## 3.5 Linking tasks to the model

This section explains how to link a task to one or more model objects. It also explains how to remove existing objects from the task.

Click the links below to find out more:



- [Adding objects to a task on page 128](#)
- [Removing objects from a task on page 129](#)
- [Copying objects to another task on page 129](#)
- [Linking a task to user-defined attributes on page 130](#)

### Adding objects to a task

To add objects to a task:

1. Select a task in the task list.
2. In Tekla Structures, select the objects you want to add.
3. Do one of the following:
  - In Tekla Structures, right-click and select **Task --> Add to Selected Task** from the pop-up menu.



- In Task Manager, click  > **Add Selected Objects**.
  - In Task Manager, right-click the selected task and click **Add Selected Objects**.
4. If needed, click  and select the task. The objects that belong to the task are highlighted in the model.


Task Manager changes the color of the task bar in the Gantt chart and selects the **Task linked to model** check box when the objects have been added to the task, see the image below.



See also [Removing objects from a task on page 129](#)  
[Copying objects to another task on page 129](#)

## Removing objects from a task

To remove the selected objects from a task:



1. Select a task in the task list.
2. Optional: In Tekla Structures, select the objects you want to remove.  
 If you do not select any model objects, all objects are removed from the task.
3. Do one of the following:
  - In Tekla Structures, right-click and select **Task --> Remove from Selected Task** from the pop-up menu.
  - In Task Manager, click  > **Remove Selected Objects**.
  - In Task Manager, right-click the selected task and click **Remove Selected Objects**.
  - In Task Manager, right-click the selected task and select **Task Information... --> Objects**. Select the objects you want to remove and press the **Delete** key.
4. Click the view in Tekla Structures and then click the task again in Task Manager to verify that the objects were successfully removed.

See also [Adding objects to a task on page 128](#)  
[Copying objects to another task on page 129](#)

## Copying objects to another task

You can copy objects from one task to another in Task Manager. If you want to move objects completely from one task to another, you must manually remove the objects from the original task after copying.

To copy objects to another task:

1. Select a task in the task list.
2. Click  > **Keep Selection**.  
All objects linked to the task stay selected.
3. Select the task you want to copy the objects to.
4. Click  > **Add Selected Objects**.

See also [Adding objects to a task on page 128](#)


[Removing objects from a task on page 129](#)

## Linking a task to user-defined attributes

You can connect higher-level schedules to lower-level schedules with user-defined attributes. To do this, link user-defined attributes to a task type to define planned and actual dates. Then assign the task type to a task. The dates are shown in the user-defined attributes of the objects.

When you modify the schedule of a task in Task Manager, the value of the related user-defined attribute is automatically changed.

To link a task to user-defined attributes:

1. Select a task in the task list.
2. Right-click and select **Task Information....**
3. On the **General** tab, click the  button next to the **Task type** box.
4. Select the user-defined attributes from the lists for each task type.
5. Click **Modify** to apply the changes.
6. Click **OK** to close the dialog box.
7. Click **OK** to close the **Task Information** dialog box.
8. Select a task in the task list.
9. Select a task type for the task.

See also [Defining a task type on page 116](#)

## 3.6 Importing and exporting tasks

This section explains how to import and export information between Task Manager and external project management software.

Click the links below to find out more:

- [Imported task information on page 131](#)
- [Importing tasks on page 131](#)
- [Exporting tasks on page 132](#)
- [Importing task types on page 132](#)
- [Exporting task types on page 133](#)

### Imported task information

You can import general building schedules from external project management software, for example Microsoft Office Project, and then make them more specific using Task Manager.


By default, scheduled dates are imported to Task Manager as planned dates. To import baseline dates to planned dates, you need to select this option in the **Import Tasks** dialog box.

See also [Importing tasks on page 131](#)  
[Exporting tasks on page 132](#)

### Importing tasks

You can import tasks to Task Manager from external project management software. When you override an existing task or task properties, the links between the existing task and the model objects are not modified. Dependencies between tasks are imported.

To import tasks:

1. Click  > **Import....**
2. Click **Browse...** to locate the file to import.
3. In the **Open** dialog box, browse for the import file (.xml), and then click **Open**.
4. Define the import options:

- a. **Append imported tasks to scenario** adds the imported tasks at the end of the task list.
- b. **Override existing tasks** replaces the existing tasks with the imported tasks.
- c. **Override selected properties of existing tasks** imports certain task properties.

When you select this option, a list where you can select the properties is displayed.

5. Click **OK**.

Imported tasks are marked as imported and locked in Task Manager to make it easier to see what has changed.


**See also** [Imported task information on page 131](#)

## Exporting tasks

You can export tasks from Task Manager to external project management software. Dependencies between tasks are exported.

If the tasks contain only planned dates, they are exported as scheduled dates. If the tasks contain planned dates and actual dates, the planned dates are exported as baseline dates and the actual dates as scheduled dates.


To export tasks:

1. Click  > **Export...**
2. In the **Save As** dialog box, browse for the export file and select it.
3. Click **Save**.

## Importing task types

In addition to importing tasks, you can import task types to Task Manager.

To import task types:

1. Select a task in the task list.
2. Click  > **Task Types....**
3. Click **Import....**
4. In the **Import task types** dialog box, browse for the import file, and then click **Open**.
5. Select the import option:
  - a. **Override task types using the same name** replaces the existing task types that have the same task type name as the imported task types.


- b. **Append imported task types** adds the imported task types at the end of the task type list.
6. Click **OK** to close the dialog box.

See also [Imported task information on page 131](#)

## Exporting task types

You can export task types from Task Manager to external project management software.

To export task types:

1. Select a task in the task list.
2. Click  > **Task Types....**
3. Click **Export....**
4. In the **Save As** dialog box, browse for the export file and select it, or enter a file name in the **File name** box.
5. Click **Save**.

See also [Imported task information on page 131](#)

## 3.7 Managing scenarios

This section explains how to create and remove scenarios in Task Manager.

Click the links below to find out more:

- [Creating a scenario on page 133](#)
- [Opening a scenario on page 134](#)
- [Removing a scenario on page 134](#)

### Creating a scenario

You can create different task scenarios, for example, design, fabrication and erection schedules to help in project planning. You can also create separate weekly scenarios, for example, for easier project follow-up.

To create a scenario in Task Manager:

1. Click .

2. Click **Add**.

Task Manager names the new scenario as **Scenario** and adds a running number to the name, for example **Scenario 1**. You can rename the scenario.

3. Click **Open** to modify the new scenario.

The new scenario does not have any tasks in it.

4. If needed, copy tasks from another scenario.

- a. Open the scenario from which you want to copy.

- b. Select the tasks that you want to copy.

The subtasks of the selected tasks are also copied.

- c. Right-click and select **Copy**.

- d. Go back to the new scenario, select a location for the copied tasks in the task list, right-click and select **Paste**.

If you select a task in the task list, the copied tasks are placed on the same level as the selected task. If you do not select any location in the task list, the copied tasks are placed after all existing tasks.




If you link an object to a user-defined attribute, we recommend that you keep the object within one scenario. If the dates in a task change, the user-defined attribute dates change as well. The changed dates are used in all the scenarios the object belongs to.

---

**See also** [Opening a scenario on page 134](#)  
[Removing a scenario on page 134](#)  
[Managing individual objects in a task on page 120](#)

## Opening a scenario


To open a scenario in Task Manager:

1. Click .
2. Select a scenario in the list.
3. Click **Open**.

**See also** [Creating a scenario on page 133](#)  
[Removing a scenario on page 134](#)

## Removing a scenario

To remove a scenario in Task Manager:

1. Click .
2. Select the scenario you want to remove.
3. Right-click and select **Delete**.
4. In the dialog box that opens, click **Yes** to confirm.

See also [Creating a scenario on page 133](#)

## 3.8 Viewing tasks



This section explains the different methods you can use to view, select, highlight, and filter tasks.









Click the links below to find out more:

- [Arranging tasks on page 135](#)
- [Highlighting a task on page 136](#)
- [Selecting multiple tasks in the task list on page 137](#)
- [Selecting multiple tasks in the Gantt chart on page 137](#)
- [Viewing related tasks on page 138](#)
- [Viewing related model objects on page 138](#)
- [Viewing selected tasks on page 138](#)
- [Filtering visible tasks on page 139](#)
- [Creating a view or selection filter for tasks on page 139](#)

### Arranging tasks

There are several ways to arrange tasks in Task Manager. You can change the order and hierarchy of tasks, and the sort order of columns. When you move a task, the related subtasks are also moved to the new location.

To	Do this
Change the order of tasks	Select a task and click  or  until the task is in the desired location. You can move more than one task at a time.

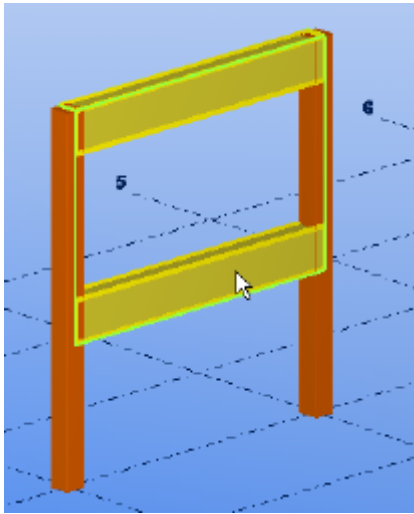
To	Do this
Place tasks in hierarchical order	<p>To make a summary task or change a subtask to a task, select a task and click .</p> <p>To make a subtask, select a task and click .</p> <p>You can move more than one task at a time.</p>
Expand task hierarchies	<p>Select a task and click . This expands the hierarchies that are on the same level.</p> <p>To expand the hierarchies of all tasks, hold down the <b>Ctrl</b> key and click .</p>
Collapse task hierarchies	<p>Select a summary task and click . This collapses the hierarchies that are on the same level.</p> <p>To collapse the hierarchies of all tasks, hold down the <b>Ctrl</b> key and click .</p>
Change the sort order of tasks	<p>Click the column heading you want to sort by.</p> <p>To reverse the sort order, click the column heading again.</p>
Save the sort order of tasks	Click  and select <b>Save Current Order</b> .
Revert to the saved sort order of tasks	Click  and select <b>Return to Saved Order</b> .

## Highlighting a task


Tekla Structures contains a selection switch that can be used for highlighting tasks in the model. When you place the mouser pointer over a model object that belongs to a task, Tekla



Structures highlights the task and the related subtasks. The green box shows the boundaries of the task.



To highlight a task in the model:

1. In Tekla Structures, click  to activate the **Select Tasks** switch.
2. Place the mouse pointer over a model object. If the object belongs to a task, Tekla Structures highlights the task.

**See also** [Viewing related tasks on page 138](#)

[Viewing related model objects on page 138](#)

[Creating a view or selection filter for tasks on page 139](#)

## Selecting multiple tasks in the task list

To select multiple tasks at a time, do one of the following:

- Drag across the rows that you want to select.
- Click a single row, and then hold down the **Ctrl** key while you click other rows that you want to select.
- Click the first row of the selection and then hold down the **Shift** key while you click the last row of the selection.

**See also** [Selecting multiple tasks in the Gantt chart on page 137](#)

## Selecting multiple tasks in the Gantt chart

To select multiple tasks at a time, do one of the following:

- Select an area in the Gantt chart.
- Select a time period in the Gantt chart by dragging the mouse on the header line.

The tasks within the selected area are highlighted in the task list.

**See also** [Selecting multiple tasks in the task list on page 137](#)

## Viewing related tasks

The **Show Related Task** command selects all the tasks the model object belongs to in the task list. The tasks are highlighted but not selected in the model.

To view the related tasks:

1. Ensure that the **Select Tasks** switch is **not** active.
2. Select a model object.
3. Right-click and select **Task --> Show Related Task** from the pop-up menu.

Task Manager highlights all the tasks the object belongs to in the task list.

**See also** [Highlighting a task on page 136](#)


[Viewing related model objects on page 138](#)

[Creating a view or selection filter for tasks on page 139](#)

## Viewing related model objects

You can view the model objects of a task in the model.

To view the model objects of a task in the model:

1. Select a task in the task list.
2. Click  for automatic selection in the model.

The objects are highlighted in the model.

**See also** [Highlighting a task on page 136](#)

[Viewing related tasks on page 138](#)


[Creating a view or selection filter for tasks on page 139](#)


## Viewing selected tasks

You can define that only the selected tasks are shown in the task list.

To show only the selected tasks in the task list:

1. Select a task in the task list. You can also select multiple tasks.

2. Click  to show only the selected tasks.


3. Click  to show all tasks again.

See also [Filtering visible tasks on page 139](#)

## Filtering visible tasks

You can filter tasks in Task Manager by status, contractor, task type, and start and end dates. The filter you select determines which tasks are visible in the task list.

To filter tasks:

1. Click .
2. Select the filters you want to use.
3. Click **Filter**.
4. Click **Show all** to show all tasks.



You can also filter the task list by using the search box. To start the search, enter two characters in the search box. The search covers all visible options in the task list.

---

## Creating a view or selection filter for tasks

You can use the filtering functionality available in Tekla Structures to create view and selection filters for tasks. The filters are based on the object group functionality. The filters you create determine which objects are shown in the model and which objects can be selected.



Only the tasks in the current scenario in Task Manager are used for filtering.

---

To create a selection filter for tasks that have a start date and a task type:

1. In Tekla Structures, click **Edit --> Selection Filter...**

2. Click **Add row**.
3. Enter the planned start date, for example 15.01.2009.
4. Enter the task type, for example Fabrication.
5. Enter the filter name next to the **Save as** button, then click **Save as**.

See also

### 3.9 Customizing the calendar

This section explains how to customize the Task Manager calendar by adding non-working time such as vacations and public holidays.

Click the links below to find out more:

- [Non-working time on page 140](#)
- [Adding non-working time to the calendar on page 140](#)
- [Removing non-working time from the calendar on page 141](#)
- [Importing a holiday file on page 141](#)
- [Importing calendar information on page 142](#)

#### Non-working time

You can define non-working time, such as vacations and public holidays, in the **Non-working Periods** dialog box. Non-working time is taken into account when calculating task length in Task Manager. Weekends are non-working days by default. You can also define recurring non-working days.


When you add or modify a non-working day, the task duration (**Planned End Date** or **Actual End Date**) is not automatically changed. This means that the workload of a task may change because of the non-working days.

See also [Adding non-working time to the calendar on page 140](#)  
[Removing non-working time from the calendar on page 141](#)  
[Importing a holiday file on page 141](#)

## Adding non-working time to the calendar

You can add non-working time to Task Manager calendar.

To add non-working time:


1. Click  > **Non-working Periods....**
2. Click **Add...**
3. Enter a descriptive name for the non-working time.
4. Enter the day of the week.
5. Enter the start date and the end date.
6. Set the recurrence frequency. You have the following options: **Non-recurring**, **Weekly**, and **Yearly**.
7. If the non-working time is recurring, set the recurrence range.
8. Click **OK**.

**See also** [Removing non-working time from the calendar on page 141](#)  
[Importing a holiday file on page 141](#)

## Removing non-working time from the calendar

You can remove non-working time from Task Manager's calendar.

To remove non-working time:


1. Click  > **Non-working Periods....**
2. Select an item from the list.
3. Click **Remove**.

**See also** [Adding non-working time to the calendar on page 140](#)

## Importing a holiday file

You can import holiday files (.hol) from Microsoft Outlook.

To import an Outlook holiday file:

1. Click  > **Non-working Periods....**
2. Click **Import Holidays....**
3. Browse for the holiday file.

4. Select your country from the list.
5. Click **OK**.


See also [Non-working time on page 140](#)

[Removing non-working time from the calendar on page 141](#)

## Importing calendar information

You can import a calendar to Task Manager, for example, from Microsoft Project.

To import calendar information from Microsoft Project:

1. Click  > **Import...** .
2. Click **Browse** to locate the file to import.
3. In the **Open** dialog box, browse for the import file, and then click **Open**.
4. Select the **Import calendar** check box.  
The imported calendar information will overwrite the existing calendar information.
5. Click **OK**.

See also [Importing tasks on page 131](#)

## 3.10 Visualizing task schedule

This section explains how to visualize task schedules using the project status visualization tool available in Tekla Structures.

In the following example, you will first create object groups to define which tasks are shown in the model. After that you will create object representation settings to define **how** the tasks are shown in the model. Finally, you will visualize the task schedule using the project status visualization tool.

Click the links below to find out more:

- [Example: Creating object groups for tasks on page 142](#)
- [Example: Creating object representation settings for tasks on page 143](#)
- [Example: Visualizing the task schedule on page 144](#)

## Example: Creating object groups for tasks

In this example, you will create object groups to define which tasks are shown in the model. The object groups created here are related to the Task Manager scenario currently in use.

To create object groups:

1. In Tekla Structures, click **View --> Representation --> Object representation...** .
2. Click **Object group....**
3. In the **Object group – Representation** dialog box, create an object group with the following settings:

	(	Category	Property	Condition	Value	)	And/Or
<input checked="" type="checkbox"/>		Task	Planned start date	Earlier than	Review date		
<input checked="" type="checkbox"/>		Task	Planned end date	Earlier than	Review date		

4. Enter a name for the group, for example `Completed`. Enter the name in the box next to the **Save as** button, and then click **Save as**.
5. Repeat steps 3 - 4 to create an object group called `Started`. Use the following settings:

	(	Category	Property	Condition	Value	)	And/Or
<input checked="" type="checkbox"/>		Task	Planned start date	Earlier than	Review date		
<input checked="" type="checkbox"/>		Task	Planned end date	Later than or ...	Review date		

6. Repeat steps 3 - 4 to create an object group called `NotStarted`. Use the following settings:

	(	Category	Property	Condition	Value	)	And/Or
<input checked="" type="checkbox"/>		Task	Planned start date	Later than	Review date		
<input checked="" type="checkbox"/>		Task	Planned end date	Later than	Review date		

7. Repeat steps 3 - 4 to create an object group called `All`. Use the following settings:

	(	Category	Property	Condition	Value	)	And/Or
<input type="checkbox"/>		Part	Name	Equals			

8. When you have created all the required object groups, click **Close**.

**See also** [Example: Creating object representation settings for tasks on page 143](#)

[Example: Visualizing the task schedule on page 144](#)

## Example: Creating object representation settings for tasks

In this example, you will create object representation settings to define how the tasks are shown in the model.

To create object representation settings:

1. In Tekla Structures, click **View --> Representation --> Object representation...** .
2. In the **Object Representation** dialog box, click **Add row** to add a new row.
3. In the **Object group** column, select the object group **Completed** from the list.
4. In the **Color** column, select a color for the object group, for example **White**.
5. In the **Transparency** column, select a transparency setting for the object group, for example **Visible**.
6. Repeat steps 2–5 to define the color and transparency settings for the other object groups (**Started**, **NotStarted**, and **All**).

For example, you can use the following settings:

Object group	Color	Transparency
Completed	 White	Visible
Started		Visible
NotStarted		90% transparent
All	 Red	50% transparent

7. Enter a name for the object representation settings, for example **Tasks**, and then click **Save as**.

**See also** [Example: Creating object groups for tasks on page 142](#)

[Example: Visualizing the task schedule on page 144](#)

## Example: Visualizing the task schedule

In this example, you will visualize the task schedule using the **Project Status Visualization** tool.

To visualize the task schedule:

1. In Tekla Structures, click **Tools --> Project Status Visualization...** .
2. Select **Tasks** from the **Object representation** list.
3. Click the step buttons to change the **Review date** and to view the changes in the model.

**See also** [Example: Creating object groups for tasks on page 142](#)

[Example: Creating object representation settings for tasks on page 143](#)

[Project Status Visualization on page 156](#)



## 3.11 Printing task schedules

This section explains how to create reports from task information and how to print task schedules that include both the task list and the Gantt chart.

Click the links below to find out more:

- [Task information reports on page 145](#)
- [Previewing a schedule before printing on page 145](#)
- [Printing a schedule on page 146](#)

### Task information reports






You can create reports from the task information in Task Manager and list various details about the tasks, such as task name, task type, planned and actual start and end dates, and task completeness.



When you create a report, you can use the existing `Task Manager` template in the report template list in **Drawings & Reports --> Create Report...**. You can customize the report for your needs by modifying the existing template or creating a new template in **Template Editor**.

### Previewing a schedule before printing

You can use the **Print Preview** command to see what a task schedule will look like when it is printed.

To preview a schedule, do any of the following:

To	Do this
Select how many pages to view at a time	<ol style="list-style-type: none"><li>1. Click  and then click <b>Print Preview...</b></li><li>2. Click one of the <b>Page Layout</b> buttons: </li></ol> <p>If the task list is very long, it is spread out on several pages.</p>
Zoom the page in or out	<ol style="list-style-type: none"><li>1. Click  and then click <b>Print Preview...</b></li><li>2. Click .</li></ol>
Print the current page	<ol style="list-style-type: none"><li>1. Click  and then click <b>Print Preview...</b></li></ol>


To	Do this
	2. Click  .
Return to Task Manager	Click  .

See also [Printing a schedule on page 146](#)

## Printing a schedule

You can print a schedule from Task Manager. Printing starts from the first date visible in the Gantt chart and ends to the last date visible in the Gantt chart.

To print a task schedule:

1. Click .
2. If needed, click **Page Setup** to modify the page settings.
3. If needed, select **Print to the project end date** to print the whole schedule even if the end date is not visible.
4. If needed, adjust the page size or fit the print to a page.
5. Click **Print** to print the schedule.
6. Modify the printer settings if needed.
7. Click **Print**.

See also [Previewing a schedule before printing on page 145](#)

# 4 Phase Manager

Use the **Phase Manager** to break a model up into sections.

Phases are often used to indicate erection sequences. You can create reports and views, hide objects, and copy objects from other models, according to their phase number.

For example, you might have a large project which several users work on simultaneously in single-user mode. First create a basic model that includes, for example, the columns. This is phase 1. You then copy this basic model to all users.

Each user then works on a separate part of the building. When a part of the model is completed, you can copy it back to the basic model as a separate phase (phase 2, 3, etc.).

See also [Dividing the model into phases on page 147](#)

[Custom phase properties on page 148](#)

## 4.1 Dividing the model into phases

To divide a model into phases:

1. Click **Tools --> Phase Manager...**

The **Phase Manager** dialog box appears.

2. Click **Add** to create new phases.
3. Click **Set current** to make the selected phase the current phase.

From now on, Tekla Structures assigns all objects you create to the current phase. The @ character in front of the phase number indicates the current phase.

4. Divide the model into phases.
  - a. To identify the phase of an object, select an object and click **Phases by objects**.  
Tekla Structures selects the phase of the object.
  - b. To see which objects belong to a certain phase, select a phase from the list and then click **Objects by phases**.

Tekla Structures highlights the corresponding objects in the model.

- c. To change the phase of one or more objects, select the objects, select a phase from the list, and then click **Modify phase**.
5. Click **OK** to save your changes.

**See also** [Custom phase properties on page 148](#)  
[Phase Manager on page 147](#)

## 4.2 Custom phase properties

You can add custom phase properties, which will appear as extra columns in the **Phase Manager** dialog box.

Define the names of phase properties in the `objects.inp` file. To use phase properties in reports and templates, use the syntax `PHASE.ATTRIBUTE_NAME` in the phase property field name.

**See also** [Phase Manager on page 147](#)

# 5 Lotting

With lots you can group assemblies for transporting to site. Lotting means that you evaluate specific model parts with respect to the number of units that can be carried by a transfer vehicle. For example, you can calculate how many concrete truck deliveries are needed to pour the footings or slabs for a specific portion of the model. With this information, it is easier to determine area requirements and create an erection schedule.

When you define lots, you must take into account the load-carrying capacity of the vehicle, because a lot cannot exceed the maximum total load capacity. You can calculate truck load sizes based on material weights and model quantities. For most model parts, the weight is based on the size, length, and material of the part.



To view the properties of a part, right-click the part and then select **Inquire > Part or Properties...**

---

You can use lotting in conjunction with the **Sequencer** tool. For example, you can load each part of the model onto a specific truck based on the erection sequence of the part.

The basic lotting process is the same for steel and concrete parts. However, if you are using cast-in-place concrete, remember that the concrete is transported in a volumetric container (for example, in a ten-cubic-yard truck). In that case, you must calculate the weight-carrying capacity of the concrete vehicle before defining the number of lots.

**See also** [Creating a lot on page 149](#)  
[Adding parts to a lot on page 150](#)  
[Removing parts from a lot on page 151](#)  
[Deleting a lot on page 151](#)  
[Sequencer on page 152](#)

## 5.1 Creating a lot

To create a lot:

1. Click **Tools** --> **Lotting** to display the **Lotting** dialog box.
2. Click **Properties...** to display the **Lot Properties** dialog box.
3. Enter a name in the box at the bottom of the dialog box.
4. Enter a lot number in the **Number** box.
5. Enter the maximum weight of the lot in the **Max weight** box. The units depend on the settings in **Tools** --> **Options** --> **Options** --> **Units and decimals**.
6. Click **Add**.

Tekla Structures creates an empty lot with the defined properties.

See also [Adding parts to a lot on page 150](#)

[Removing parts from a lot on page 151](#)

[Deleting a lot on page 151](#)

## 5.2 Adding parts to a lot

After you have created the needed lots, you must select each part of the model and assign them to a lot until the total load weight of the lot reaches the specified target.

To add parts to a lot:

1. Click **Tools** --> **Lotting** to display the **Lotting** dialog box.
2. Select an existing lot from the list.

Tekla Structures highlights the parts included in the lot. The total weight of the lot and the number of assemblies it contains are displayed under **Applied values**.

3. Hold down **Shift** and select the parts that you want to add to the lot.
4. Click **Apply selected**.

The weight and number of the added parts is displayed under **Current values**. Tekla Structures displays a warning message if the weight limit of the lot is exceeded.

5. Click **OK** to close the dialog box.

When you re-open the dialog box, the **Applied values** include the weight and number of the parts you added.



Parts can belong only to one lot at a time. If you add parts that are already in another lot, the parts will be removed from that lot.

---

**See also** [Creating a lot on page 149](#)  
[Removing parts from a lot on page 151](#)  
[Deleting a lot on page 151](#)

## 5.3 Removing parts from a lot

To remove parts from a lot:

1. Click **Tools** --> **Lotting** to display the **Lotting** dialog box.
2. Select an existing lot from the list.  
Tekla Structures highlights the parts included in the lot.
3. Hold down **Ctrl** and select the parts you want to remove from the lot.  
Tekla Structures deselects the parts.
4. Click **Apply selected**.
5. Click **OK** to close the dialog box.

**See also** [Creating a lot on page 149](#)  
[Adding parts to a lot on page 150](#)  
[Deleting a lot on page 151](#)

## 5.4 Deleting a lot

To delete a lot:

1. Click **Tools** --> **Lotting** to display the **Lotting** dialog box.
2. Click **Properties...**
3. Select an existing lot from the list.
4. Click **Delete**.

**See also** [Creating a lot on page 149](#)  
[Adding parts to a lot on page 150](#)  
[Removing parts from a lot on page 151](#)

# 6 Sequencer

Use the **Sequencer** tool to name sequences and assign incremental numbers to parts. For example, you can define the order in which to erect parts by creating erection sequences. You can define several sequences for different purposes, and a part can belong to several sequences at the same time.

**Sequencer** works by assigning a sequence number to a user-defined attribute of a part. The sequence name that you enter in the **Sequencer Properties** dialog box is the name of the user-defined attribute defined in the `objects.inp` file.

**Limitations** Sequencer does not work for objects that are inside a reference model.

**See also** [Creating a sequence on page 152](#)

[Adding parts to a sequence on page 153](#)

[Checking the sequence of a part on page 154](#)

[Modifying the sequence number of a part on page 154](#)

[Deleting a sequence on page 155](#)

## 6.1 Creating a sequence

Use the **Sequencer** tool to assign sequence numbers to parts. If you want to view and modify the sequence number afterwards, you must first create a user-defined attribute to which you assign sequence numbers.

To create a new sequence:

1. Create a user-defined attribute to which you assign sequence numbers.
  - a. Open the `objects.inp` file in any standard text editor.
  - b. In the `Part attributes` section, add a new user-defined attribute.



The `value_type` must be integer, and the `field_format` must be %d.

For example:

```
attribute("MY_INFO_1", "My Info 1", integer, "%d", no,  
none, "0.0", "0.0")
```

- c. Save the file.
  - d. Restart Tekla Structures.
2. Click **Tools** --> **Sequencer** to display the **Sequencer Properties** dialog box.
  3. Enter a name for the sequence. Use exactly the same name as in the `objects.inp` file.

For example, `MY_INFO_1`.

4. Click **Apply**.
5. Select the parts you want to include in the sequence.

The first part gets the sequence number 1, the second part number 2, and so on.

If you select a part that has already been included in the sequence, Tekla Structures asks if you want to override the existing number. If you click **Yes**, Tekla Structures gives the next available number to the part.

6. To finish adding parts to the sequence, click **Edit** --> **Interrupt** or press **Esc**.

**See also** [Adding parts to a sequence on page 153](#)

[Checking the sequence of a part on page 154](#)

[Modifying the sequence number of a part on page 154](#)

[Deleting a sequence on page 155](#)

## 6.2 Adding parts to a sequence

To add parts to an existing sequence:

1. Click **Tools** --> **Sequencer** to display the **Sequencer Properties** dialog box.
2. Select a sequence name from the list.
3. Click **OK** or **Apply**.
4. Select the parts you want to add to the sequence.
5. To finish adding parts to the sequence, click **Edit** --> **Interrupt** or press **Esc**.



You cannot add new parts to a sequence, unless the new part is at the end of the sequence. If the sequence changes, you must redefine the whole sequence.

---

**See also** [Creating a sequence on page 152](#)  
[Checking the sequence of a part on page 154](#)  
[Modifying the sequence number of a part on page 154](#)  
[Deleting a sequence on page 155](#)

## 6.3 Checking the sequence of a part

You can check the sequence name and number of a part by using the **Inquire** tool.

To check the sequence of a part:

1. Click **Tools --> Inquire --> Object**.
2. Select a part.

Tekla Structures displays the properties of the part. The sequence name and number are displayed under **More**. For example:

```
More:  
Sequence_1      : 5  
Sequence_2      : 4
```

**See also** [Creating a sequence on page 152](#)  
[Adding parts to a sequence on page 153](#)  
[Modifying the sequence number of a part on page 154](#)  
[Deleting a sequence on page 155](#)

## 6.4 Modifying the sequence number of a part

Before you start, assign a sequence number to a user-defined attribute of a part.

To modify the sequence number of a part:

1. Double-click a part to open the part properties dialog box.
2. Click **User-defined attributes...**

The current sequence number is displayed next to the user-defined attribute to which you assigned the sequence number. For example, MY\_INFO\_1.

3. Modify the sequence number.
4. Click **Modify**.

**See also** [Creating a sequence on page 152](#)  
[Adding parts to a sequence on page 153](#)

[Checking the sequence of a part on page 154](#)

[Deleting a sequence on page 155](#)

## 6.5 Deleting a sequence

To delete a sequence:

1. Click **Tools** --> **Sequencer...** .
2. Select a sequence name from the list.
3. Click **Delete** and then click **Yes**.

**See also** [Creating a sequence on page 152](#)

[Adding parts to a sequence on page 153](#)

[Checking the sequence of a part on page 154](#)

[Modifying the sequence number of a part on page 154](#)

# 7 Project Status Visualization

Use the **Project Status Visualization** tool to review the status of modeling objects in a specific time frame. For example, use this tool to:

- display the erection schedule for groups of parts using different colors
- identify the parts that are scheduled to be fabricated during a specific time period.

Before you can create project status visualizations, you need to define some color and transparency settings that include object groups based on date rules.

You can also define tasks for parts and assemblies using **Task Manager**. The project status visualization can then be based on tasks.

**See also** [Creating a visualization on page 156](#)

[Copying visualization settings to another model on page 157](#)

[Deleting visualization settings on page 157](#)

[Example: Visualizing the erection schedule of a project on page 157](#)

[Visualizing task schedule on page 142](#)

## 7.1 Creating a visualization

To create a project status visualization:

1. Click **Tools --> Project Status Visualization...** to open the **Project Status Visualization** dialog box.
2. Modify the visualization settings.
  - a. In the **Object representation** list, select one of the predefined object representation settings.
  - b. Define a start and end date for the time scale slider.
  - c. Define the length of the time step.
3. Select the **Refresh view automatically** check box.

4. Enter a unique name in the box next to the **Save as** button.
5. Click **Save as** to save the visualization settings.
6. To view the visualization in the model, click the step buttons.

**See also** [Project Status Visualization on page 156](#)

[Example: Visualizing the erection schedule of a project on page 157](#)

## 7.2 Copying visualization settings to another model

To copy project status visualization settings to another model:

1. Select the visualization settings you want to copy.  
The settings you have created are located in the model's `\attributes` folder, and they have the file name extension `.4d`.
2. Select where you want to copy the settings.
  - To make the settings available in another model, copy them to the `\attributes` folder of the destination model.
  - To make the settings available in all models, copy them to the project or firm folder, defined by the advanced option `XS_PROJECT` or `XS_FIRM`.
3. Include a copy of the object representation settings file (`.rep`) and object group files (`.PObjGrp`) in the `\attributes`, project, and firm folders to ensure that all the files will work correctly.
4. Restart Tekla Structures.

**See also** [Project Status Visualization on page 156](#)

## 7.3 Deleting visualization settings

To delete project status visualization settings:

1. Delete the visualization file located in the model's `\attributes` folder.  
Project status visualization settings have the file name extension `.4d`.
2. Restart Tekla Structures.

**See also** [Project Status Visualization on page 156](#)

## 7.4 Example: Visualizing the erection schedule of a project

This example shows how to visualize erection schedules using the **Project Status Visualization** tool. The workflow consists of five tasks:

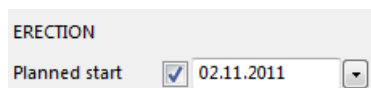
1. [Example: Defining an erection schedule on page 158](#)
2. [Example: Selecting objects for the visualization on page 158](#)
3. [Example: Defining the color and transparency of selected objects on page 159](#)
4. [Example: Defining a time period on page 160](#)
5. [Example: Viewing the erection schedule on page 161](#)

### Example: Defining an erection schedule

Start by defining an erection schedule for parts using the user-defined attribute **Erection Planned start**. This task is phase 1 in the workflow [Example: Visualizing the erection schedule of a project on page 157](#).

To define an erection schedule:

1. Double-click a part to open the part properties dialog box.
2. Click **User-defined attributes...**
3. On the **Workflow** tab, modify the value of the user-defined attribute **Erection Planned start**.



4. Ensure that all the check boxes are cleared.
5. Select the **Erection Planned start** check box.
6. Select all the parts for which you want to use the same erection date.



To make it easier to select parts, create a separate selection filter for each group of parts.

7. Click **Modify**.
8. Repeat steps 1–7 for each group of parts in your model.

You can use a different erection date for each group of parts.

## Example: Selecting objects for the visualization

After defining an erection schedule, you can continue by creating an object group that defines which objects are shown in the model during the visualization. This task is phase 2 in the workflow [Example: Visualizing the erection schedule of a project on page 157](#).

To create the object group:

1. Click **View --> Representation --> Object representation...** to open the **Object Representation** dialog box.
2. Click **Object group...** to open the **Object Group – Representation** dialog box.
3. Create an object group that includes all objects whose user-defined attribute **Erection Planned start** is earlier than or equal to the review date.
  - a. In the **Category** list, select **Object**.
  - b. In the **Property** list, select **PLANNED\_START\_E**.
  - c. In the **Condition** list, select **Earlier than or equal**.
  - d. In the **Value** list, select **Select date...** The **Select Date** dialog box appears.
  - e. Select **Review date** and click **OK**.
4. In the box next to the **Save as** button, enter a name for the group. For example, `plan_same_or_before_review_date`.
5. Click **Save as**.

	(	Category	Property	Condition	Value
<input checked="" type="checkbox"/>		Object	PLANNED_START_E	Earlier than or equal	Review date

## Example: Defining the color and transparency of selected objects

After defining which objects are shown in the model during the visualization, you can continue by defining color and transparency settings that define **how** the objects are shown during the visualization. This task is phase 3 in the workflow [Example: Visualizing the erection schedule of a project on page 157](#).

To define color and transparency settings:

1. Click **View --> Representation --> Object Representation...** to open the **Object Representation** dialog box.
2. Define color and transparency settings for the object group that you created in [Example: Selecting objects for the visualization on page 158](#).
  - a. Click **Add row**.
  - b. In the **Object group** list, select the object group you just created.
  - c. In the **Color** list, select **Color by class**.
  - d. In the **Transparency** list, select **Visible**.

3. Define another set of color and transparency settings to hide the rest of the parts from the model.
  - a. Click **Add row**.
  - b. In the **Object group** list, select the object group **All**.
  - c. In the **Color** list, select **Color by class**.
  - d. In the **Transparency** list, select **Hidden**.
4. In the box next to the **Save as** button, enter a name for the settings. For example, `planned_start_erection_date`.
5. Click **Save as**.

Object group	Color	Transparency
plan_same_or_before_review_date	Color by class	Visible
All	Color by class	Hidden

## Example: Defining a time period

After defining how the objects are shown during the visualization, you can continue by defining a time period for the visualization. This task is phase 4 in the workflow [Example: Visualizing the erection schedule of a project on page 157](#).

To create visualization settings:

1. Click **Tools --> Project Status Visualization...** to open the **Project Status Visualization** dialog box.
2. Define the length of the time step.
3. Define a start and end date for the time scale slider.
4. In the **Object representation** list, select the object representation setting you created in [Example: Defining the color and transparency of selected objects on page 159](#).
5. Select the **Refresh view automatically** check box.
6. In the box next to the **Save as** button, enter a name for the visualization.
7. Click **Save as** to save the visualization settings.



**Review**

Review date: 02.11.2011

Step backward or forward:

<< >> 3 day(s)

Or select date on the time scale:

Scale start: 02.11.2011 Scale end: 30.11.2011

Object representation: planned\_start\_errection\_date Edit...

☒ Refresh view automatically

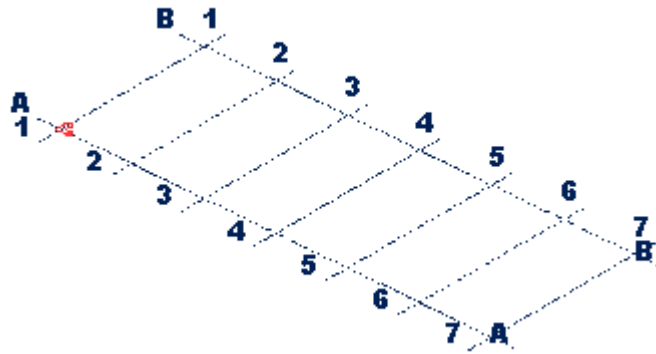
## Example: Viewing the erection schedule

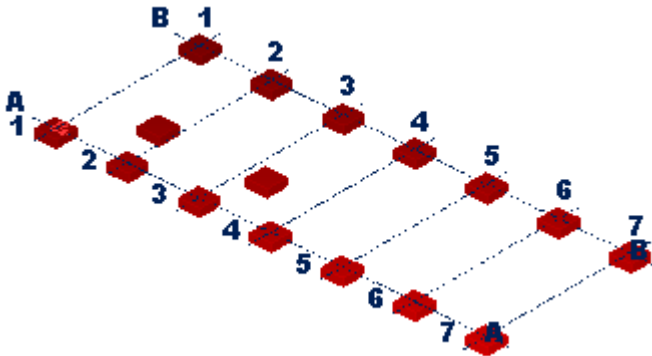
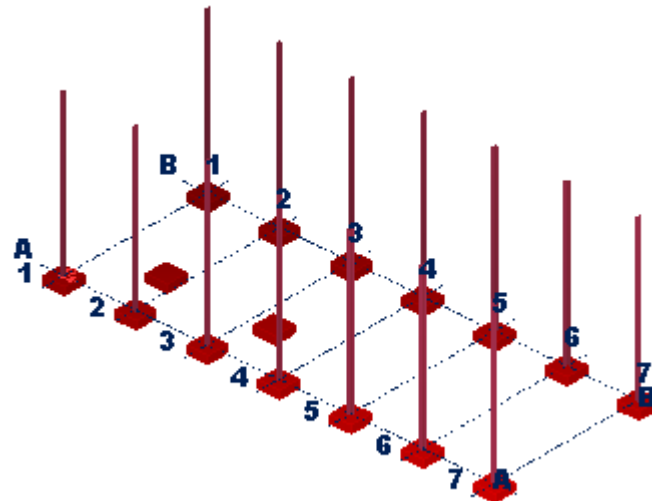
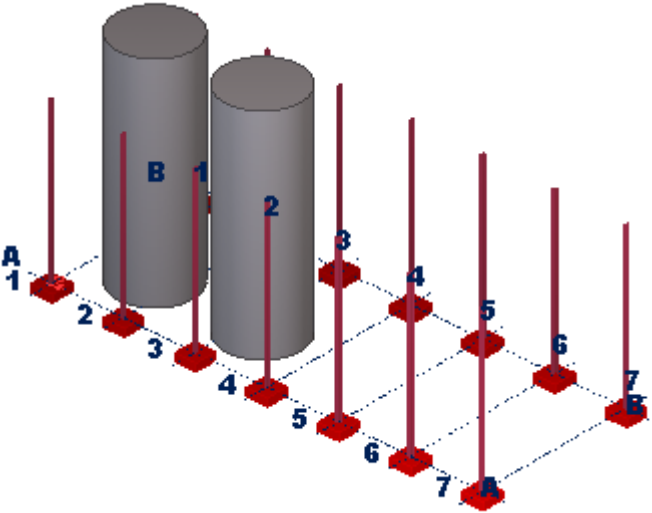
You are now ready to view the erection schedule using the **Project Status Visualization** tool. This task is phase 5 in the workflow [Example: Visualizing the erection schedule of a project on page 157](#).

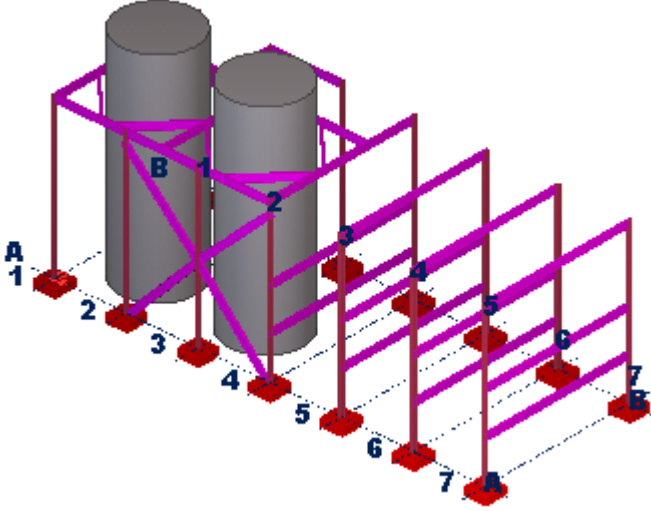
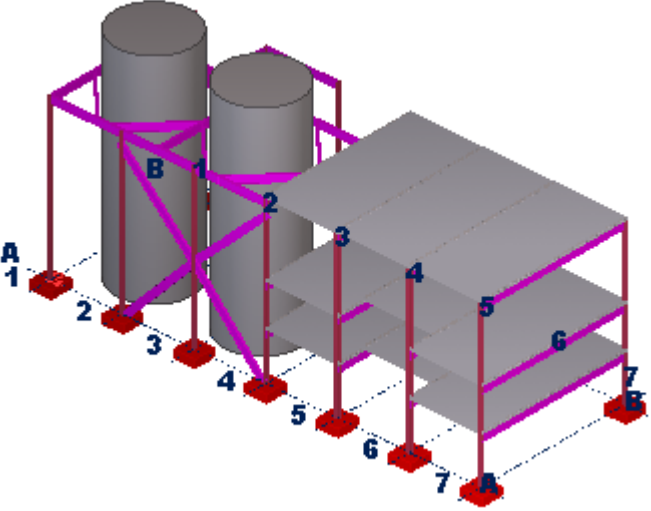
To view the erection schedule:

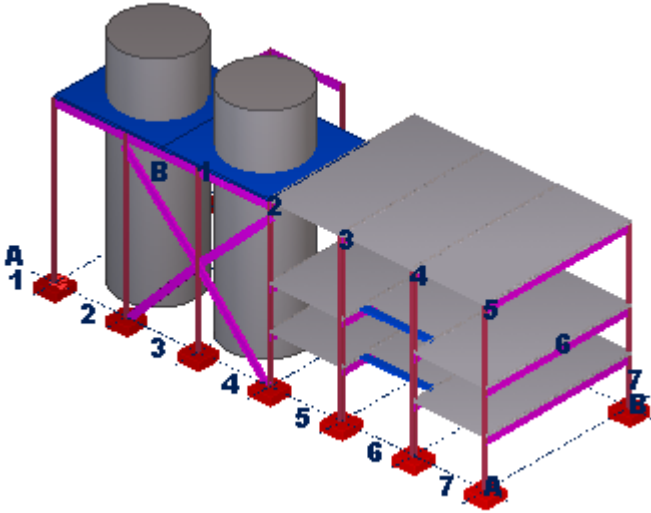
1. Click **Tools** --> **Project Status Visualization...** to open the **Project Status Visualization** dialog box.
2. In the list next to the **Load** button, select the visualization setting you created in [Example: Defining a time period on page 160](#).
3. Click **Load**.
4. To view the visualization in the model, click the step buttons.

The images below show how the objects are shown when you change the review date:

Review date	Visualization
November 02	

Review date	Visualization
November 05	 <p>A 3D visualization of a project grid. The grid is composed of red cubes arranged in a 7x7 pattern. The cubes are labeled with blue text: 'A' at the bottom-left corner, 'B' at the top-right corner, and numbers 1 through 7 along the top and right edges. The cubes are connected by dashed blue lines, forming a grid structure.</p>
November 08	 <p>A 3D visualization of a project grid, similar to the one in the previous row. The grid is composed of red cubes arranged in a 7x7 pattern. The cubes are labeled with blue text: 'A' at the bottom-left corner, 'B' at the top-right corner, and numbers 1 through 7 along the top and right edges. The cubes are connected by dashed blue lines, forming a grid structure. Vertical red lines are added to the grid, extending upwards from the cubes.</p>
November 11	 <p>A 3D visualization of a project grid, similar to the ones in the previous rows. The grid is composed of red cubes arranged in a 7x7 pattern. The cubes are labeled with blue text: 'A' at the bottom-left corner, 'B' at the top-right corner, and numbers 1 through 7 along the top and right edges. The cubes are connected by dashed blue lines, forming a grid structure. Vertical red lines are added to the grid, extending upwards from the cubes. Two large grey cylinders are added to the grid, positioned over the cubes labeled 'B' and '1'.</p>

Review date	Visualization
November 14	 <p>A 3D visualization showing a project structure. Two large gray cylinders are positioned on the left. A grid of points, labeled A1 through 7B, is shown on the right. The points are connected by lines, forming a network. The points are arranged in a grid with 7 columns and 2 rows. The first column is labeled A1, A2, A3, A4, A5, A6, A7. The second column is labeled B1, B2, B3, B4, B5, B6, B7. The points are connected by lines, forming a network. The lines are colored red and blue. The cylinders are labeled B1 and B2.</p>
November 17	 <p>A 3D visualization showing a project structure. Two large gray cylinders are positioned on the left. A grid of points, labeled A1 through 7B, is shown on the right. The points are connected by lines, forming a network. The points are arranged in a grid with 7 columns and 2 rows. The first column is labeled A1, A2, A3, A4, A5, A6, A7. The second column is labeled B1, B2, B3, B4, B5, B6, B7. The points are connected by lines, forming a network. The lines are colored red and blue. The cylinders are labeled B1 and B2.</p>

Review date	Visualization
<p>November 20</p>	

# 8 Profiles

The profile catalog contains information on profiles, their rules and types, and the analysis and design properties of the profiles. Profiles are displayed in a hierarchical tree grouped according to rules.

By default, the profile catalog contains standard, environment-specific profiles and generic parametric profiles. You can add, modify, import, export, and delete profiles.

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



Because of the various profile catalog improvements in Tekla Structures 20.0, the `profdb.bin` file in Tekla Structures 20.0 or newer is not compatible with versions earlier than 20.0.

---

**See also** [Profile types on page 165](#)

[Managing profiles on page 166](#)

[Importing and exporting profiles on page 173](#)

[Creating your own profiles on page 180](#)

[Defining standardized values for parametric profiles on page 215](#)

[Creating an image of a profile on page 216](#)

[Predefined parametric profiles available in Tekla Structures on page 217](#)

[Shapes on page 250](#)

## 8.1 Profile types

There are two types of profiles in Tekla Structures:

- *Fixed profiles*



Fixed profiles are profiles that can be obtained pre-manufactured. The properties of the fixed profiles conform to industry standards, and you should not modify them unless you are an administrator. Fixed profiles are environment-specific.

- *Parametric profiles*



Parametric profiles are partly user-definable: they have a predefined shape but you can change their cross section dimensions using one or more parameters. Tekla Structures calculates the cross section shape each time you open the model.

You can use the profiles available in Tekla Structures, or you can define your own user-defined profiles, which can be either fixed or parametric. Use the profile catalog to create new fixed profiles, either from scratch or by copying an existing one. Use the sketch editor or .c1b files to create new parametric profiles.

**See also** [Creating your own profiles on page 180](#)

[Predefined parametric profiles available in Tekla Structures on page 217](#)

## 8.2 Managing profiles


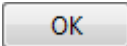
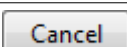
You can manage existing profiles using the profile catalog. For example, you can group profiles and add your own attributes to profiles.

Click the links below to find out more:

- [Important buttons in the profile catalog on page 166](#)
- [Grouping profiles on page 167](#)
- [Adding user attributes to profiles on page 169](#)
- [Associating profile types with a certain material on page 172](#)
- [Deleting a profile on page 173](#)

### Important buttons in the profile catalog

When you work with the profiles, note the usage of the following buttons in the **Modify Profile Catalog** dialog box:


Button	Description
	Saves the changes of a single edited profile to the computer's memory until you click <b>OK</b> .
	Saves the changes in the model folder.  Tekla Structures saves the modified catalog on the hard disk when you click <b>OK</b> to close the dialog box and then click <b>OK</b> in the <b>Save confirmation</b> dialog box.
	Closes the <b>Modify Profile Catalog</b> dialog box without saving the changes.  Note that all changes made to the catalog will be lost even if you have clicked <b>Update</b> , because the changes have not been saved on the hard disk. The changes made to the catalog are visible during one session, because the catalog is using the computer's memory. When you start Tekla Structures the next time, the previous data is restored from the hard disk.

Tekla Structures stores the information of fixed profiles in the `profdb.bin` file. When you first open a model, Tekla Structures reads the data from the hard disk and stores it in the computer's memory.

When you select a profile, Tekla Structures reads the data from the computer's memory and displays it in the **Modify Profile Catalog** dialog box. This is faster than accessing the data from the hard disk.

See also [Managing profiles on page 166](#)

## Grouping profiles

In the profile catalog, the profiles are displayed in a hierarchical tree and they are grouped according to rules  , such as the profile type (for example, **I profiles**) and the profile subtype (for example, **HEA**). To change how the profiles are grouped in the profile tree, you need to modify the rules.

The order in which you create the rules does not matter, only the location of the rules in the profile tree.

Tekla Structures reads the rules from top to bottom in the profile tree. Profiles are in the highest group where they meet the criteria defined in the rule. For example, a rule that collects **All profiles** overrides all rules that are below it in the profile tree.

See also [Adding a rule on page 167](#)  
[Modifying a rule on page 168](#)

## Adding a rule

To add a rule:

1. Click **Modeling --> Profiles --> Profile Catalog...** to open the **Modify Profile Catalog** dialog box.

2. Right-click any existing rule and select **Add Rule**.

The **Profile manager rules** dialog box appears.

3. Define the rule properties.
  - a. Enter a rule name in the **Rule name** box.
  - b. Select the **Profile type** to which the rule is applied.
  - c. Enter the **Name filter string** that defines the new rule.

By default, the wildcard symbol (\*) is entered, meaning "all entries".

For example, to group all catalog entries with names beginning with A, enter A\* in the **Name filter string** box, or to group all catalog entries with names containing 100, enter \*100\*. Tekla Structures groups the catalog entries that meet your criteria under the new rule.

4. Click **OK** to close the **Profile manager rules** dialog box.
5. Click **OK** to close the **Modify Profile Catalog** dialog box.
6. Click **OK** in the **Save confirmation** dialog box to save the changes.



You can add a next level rule that creates a subgroup under an existing rule. Use the **Add Next Level Rule** command to add the next level rule.

---

See also [Modifying a rule on page 168](#)

### ***Modifying a rule***

To modify a rule:

1. Click **Modeling --> Profiles --> Profile Catalog...** to open the **Modify Profile Catalog** dialog box.
2. Right-click any existing rule and select **Edit Rule**.

The **Profile manager rules** dialog box appears.
3. Modify the rule properties.
4. Click **OK** to close the **Profile manager rules** dialog box.
5. Click **OK** to close the **Modify Profile Catalog** dialog box.



6. Click **OK** in the **Save confirmation** dialog box to save the changes.

Profiles in the profile tree are listed in an alphabetical order, and rules are listed in the order you specify. To change the order in which the rules appear, use the **Move up** and **Move down** commands.



If you want to delete a rule, select an existing rule and click **Delete Rule**.

---

See also [Adding a rule on page 167](#)

## Adding user attributes to profiles

You can add your own attributes to profiles. For example, you can specify paint layer thickness, define the maximum grain size of concrete, sort out different profile types by material, or create profile aliases for converting imperial profiles to metric and vice versa.

To add a user attribute to a profile:

1. Click **Modeling --> Profiles --> Profile Catalog...** to open the **Modify Profile Catalog** dialog box.
2. On the **User attributes** tab, click **Definitions...**

The **Modify Profile Properties** dialog box appears.

3. Click **Add** to add a new row.
4. To define a user attribute, click each item on a row.
  - a. In the **Profile type** list, select a profile type to which the user attribute is applied.
  - b. In the **Quantity type** list, select the type of information that the user attribute contains, for example, weight, area, ratio, or string.
  - c. In the **Order** list, define the order in which the user attributes are shown in the dialog box. Larger values are shown first.
  - d. In the **Property name** list, define a name for the property.

The name is saved in the catalog and can be used in reports and templates. When **Property name** is used in a template, `PROFILE.PROPERTY_NAME` indicates where the property name appears. For example, `PAINT_LAYER_THICKNESS`.
  - e. In the **Symbol** column, define an abbreviation that can be used for the property, such as `Ix` or `ct`.
  - f. In the **Label** column, define a label for the attribute.
5. Click **Update**.
6. Click **OK** to close the **Modify Profile Properties** dialog box.

See also [Example: Adding a user attribute to a profile and using it in a rule on page 170](#)

**Example: Adding a user attribute to a profile and using it in a rule**

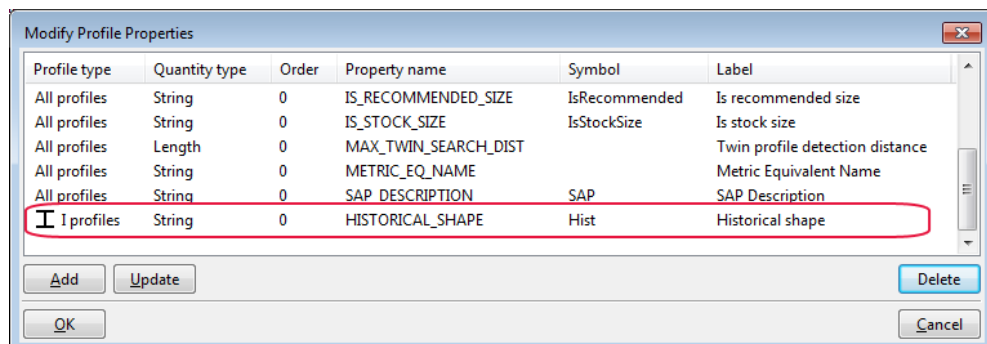
You can add your own attributes and their values to profiles. The user attributes can then be used, for example, in profile filtering.

In this example, you will add a user attribute for I profiles' rule.

To add a user attribute to a profile and using it in a rule:

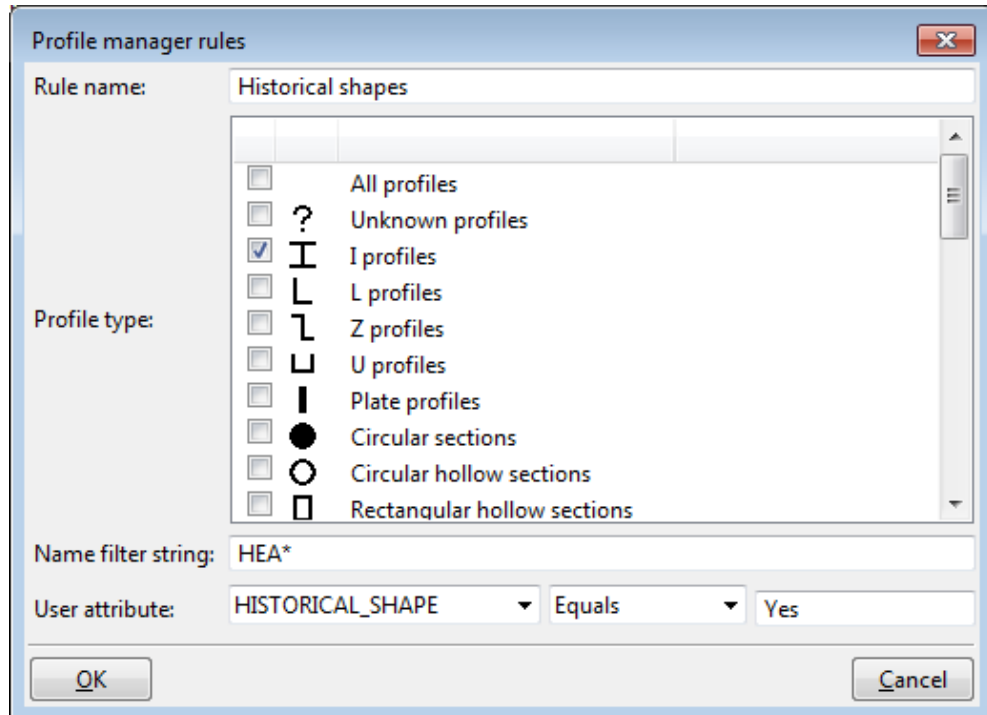
1. Click **Modeling** --> **Profiles** --> **Profile Catalog...** to open the **Modify Profile Catalog** dialog box.
2. On the **User attributes** tab, click **Definitions...**.  
The **Modify Profile Properties** dialog box appears.

3. Click **Add** to add a new row.
4. Select the row that was created and modify the properties as follows:
  - Set **Profile type** to **I profiles**.
  - Set **Quantity type** to **String**.
  - Set **Property name** to **HISTORICAL\_SHAPE**.
  - Set **Symbol** to **Hist**.
  - Set **Label** to **Historical shape**.



5. Click **Update** and **OK**.
6. In the profile tree, select **I profiles** and then **HEA**.
7. Right-click and select **Add Next Level Rule**.
8. In the **Profile manager rules** dialog box, set the rule properties as follows:
  - Set **Rule name** to **Historical shapes**.
  - In **Profile type**, clear the **All profiles** check box and select the **I profiles** check box.
  - Enter **HEA\*** in the **Name filter string** box.

- Set **User attribute** to `HISTORICAL_SHAPE` and **Equals**, and enter `Yes` in the box next to the two other boxes.



- Click **OK**.

**Historical shapes** appears in the profile tree.

- Select the required historical profile, for example **HEA120**, in the profile tree.
- Go to the **User attributes** tab and set **Value** of **Historical shape** to `Yes`.

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

- Click **Update**.
- Repeat the steps 10 and 11 for any other required profiles.

14. Click **OK** to close the **Modify Profile Catalog** dialog box.

15. Click **OK** in the **Save confirmation** dialog box to save the changes.

Next time you open the **Profile Catalog**, the profiles appear under **Historical shapes** in the profile tree.

See also [Adding user attributes to profiles on page 169](#)

[Adding a rule on page 167](#)

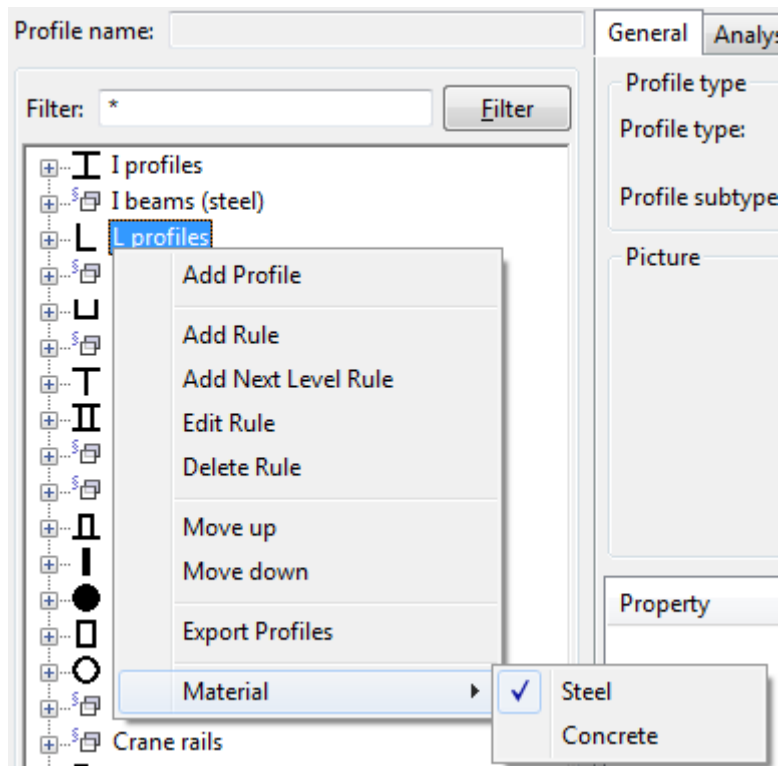
## Associating profile types with a certain material

You can define which profiles are available for steel parts, concrete parts, or both. This affects which profile types are shown in the **Select profile** dialog box when you change the material of a part.

To define the material of a profile type:

1. Click **Modeling** --> **Profiles** --> **Profile Catalog...** to open the **Modify Profile Catalog** dialog box.
2. Select a profile type, for example, **L profiles**.
3. To associate the profiles with steel, right-click and select **Material** --> **Steel** from the pop-up menu.

A check mark next to **Steel** indicates that the profiles are available for steel parts.



4. To make the selected profiles available also for concrete parts, right-click and select **Material --> Concrete**.

If needed, you can remove the check mark by clicking the material again.

5. Click **OK** to close the **Modify Profile Catalog** dialog box.
6. Click **OK** in the **Save confirmation** dialog box to save the changes.

See also

## Deleting a profile

To delete a profile:

1. Click **Modeling --> Profiles --> Profile Catalog...** to open the **Modify Profile Catalog** dialog box.
2. Select the profile that you want to delete.
3. Right-click and select **Delete Profile**.
4. Click **OK** to close the **Modify Profile Catalog** dialog box.
5. Click **OK** in the **Save confirmation** dialog box to save the changes.

Tekla Structures will continue showing parts in model views using the deleted profiles until you modify the parts or reopen the model. After that, the parts having profiles that are not available in the profile catalog, are shown as sticks without a profile.

See also [Managing profiles on page 166](#)

## 8.3 Importing and exporting profiles

Use importing and exporting for merging profiles across profile catalogs. Profile catalogs are imported and exported as `.lis` files, sketched profiles as `.uel` files, and user-defined parametric profiles as `.clb` files.

When you export an entire profile catalog, Tekla Structures creates three separate files: `profiles.clb`, `profiles.lis` and `rules.lis`. The `.clb` file contains parametric profile definitions, if they are used in the profiles in the catalog, otherwise it is empty. The `profiles.lis` file includes the actual profile definitions and the `rules.lis` file the branch rules. When you export a branch of a profile catalog, the branch name is attached as prefix to the file names.

Importing and exporting is useful when you:

- upgrade to a newer version of Tekla Structures and want to use a customized profile catalog from a previous version
- want to combine profile catalogs that are stored in different locations
- want to share profile catalog information with other users

- want to combine profile catalogs across different environments.

#### Limitations

- You cannot import or export hard-coded profiles such as PROFILE\_ZZ, PROFILE\_CC, and PROFILE\_CW.
- You cannot import profiles that do not have a defined cross section.
- If you have used a sketched profile or a user-defined parametric profile as the cross section for a fixed profile, you also need to import the sketched profile or the user-defined parametric profile to the new model.



You can also download or share profiles using Tekla Warehouse.

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See also [Exporting a profile catalog on page 175](#)

[Exporting a part of the profile catalog on page 176](#)

[Importing profile catalog items on page 174](#)

[Importing and exporting sketched profiles on page 179](#)

## Importing profile catalog items

Tekla Structures has five types of profile catalog items: fixed profiles, hard-coded parametric profiles, sketched profiles, user-defined parametric profiles, and rule sets. Profiles and rule sets are imported to Tekla Structures models as `.lis` files, sketched profiles as `.uel` files, and user-defined parametric profiles as `.clb` files.

If you are importing an entire profile catalog or a branch, we recommend that you save the related files in a separate folder. This makes the import process faster.

To import a profile catalog item:

1. Open the model to which you want to import profile catalog items.
2. Click **Modeling** --> **Profiles** --> **Profile Catalog...** to open the **Modify Profile Catalog** dialog box.
3. Click **Import...** to import a single file, or **Import Directory...** to import the contents of a file folder.
4. Select the import file or the import folder.
5. Click **OK**.

If a profile item with the same name as the profile item being imported already exists, the **Review import items** dialog box appears, and you have four options:

- **Leave:** The existing profile item is not replaced and the profile definitions in the import file are ignored.

- **Merge:** Profile properties that are different in the import file are added to the existing profile. All the other properties remain unchanged.  
Use this option to import only certain elements of the profile catalog, such as user attributes.
- **Replace:** The existing profile item is replaced with the imported profile item.
- **Continue:** The dialog box closes and the actions you selected take place. If an import item has **Unknown** as the action, it is not imported.

You can select more than one profile item at a time by using the **Shift** and **Ctrl** keys.



Each cross section definition has a unique name and ID number. If, during an import, a cross section with the same name but different properties is found in the existing profile catalog, the cross section being imported is renamed by adding an incremental number at the end of the existing name.

6. Click **OK** to close the **Modify Profile Catalog** dialog box.
7. Click **OK** in the **Save confirmation** dialog box to save the changes.

**See also** [Importing and exporting profiles on page 173](#)  
[Exporting a profile catalog on page 175](#)  
[Exporting a part of the profile catalog on page 176](#)  
[Importing sketched profiles on page 179](#)  
[Units used in import and export on page 177](#)

## Exporting a profile catalog

Profile catalogs are exported from Tekla Structures models as `.lis`, `.uel`, and `.clb` files.

To export an entire profile catalog:

1. Click **Modeling --> Profiles --> Profile Catalog...** to open the **Modify Profile Catalog** dialog box.
2. Click **Export....**
3. Browse for the folder where you want to save the export files.  
By default, the files are saved to the current model folder. For faster profile catalog import, we recommend that you create a separate subfolder for the catalog files.
4. Click **OK** to close the **Modify Profile Catalog** dialog box.

**See also** [Importing and exporting profiles on page 173](#)  
[Exporting a part of the profile catalog on page 176](#)  
[Example of profile export file on page 176](#)

[Importing profile catalog items on page 174](#)

[Units used in import and export on page 177](#)

## Exporting a part of the profile catalog

If you do not want to export an entire profile catalog, you can export a branch of the profile tree, meaning all the profiles grouped under one rule, or a single profile. Profiles and rule sets are exported from Tekla Structures models as `.lis` files, sketched profiles as `.uel` files and user-defined parametric profiles as `.clb` files.

To export a part of the profile catalog:

1. Click **Modeling --> Profiles --> Profile Catalog...** to open the **Modify Profile Catalog** dialog box.
2. Select profiles to be exported.
  - To export a branch of the profile tree, right-click the branch and select **Export Profiles**.
  - To export a single profile, right-click the profile and select **Export Profile**.
3. Browse for the folder where you want to save the export files.  
By default, the files are saved to the current model folder.  
If you are exporting a single profile, enter a name for the file.
4. Click **OK**.
5. Click **OK** to close the **Modify Profile Catalog** dialog box.

**See also** [Exporting a profile catalog on page 175](#)

[Example of profile export file on page 176](#)

[Importing profile catalog items on page 174](#)

[Units used in import and export on page 177](#)

## Example of profile export file

The export `.lis` file is divided into specific sections.

The first row in the file is `PROFILE CATALOG EXPORT VERSION = n`, where `n` is the version number.



Do not delete this row. If the row does not appear in the file, the import is canceled.

---



The next section defines the hierarchical tree structure that is used to display the contents of the catalog.

The next section contains the profiles.

#### Fixed profiles

```
PROFILE_NAME = "HEA120";
{
TYPE = 1; SUB_TYPE = 1001; COORDINATE = 0.000;
{
"FLANGE_SLOPE_RATIO"          0.000000000E+000
"ROUNDING_RADIUS_2"          0.000000000E+000
"ROUNDING_RADIUS_1"          1.200000000E+001
"FLANGE_THICKNESS"           8.000000000E+000
"WEB_THICKNESS"              5.000000000E+000
"WIDTH"                      1.200000000E+002
"HEIGHT"                     1.140000000E+002
```

#### Fixed user-defined profiles

Fixed user-defined profiles can have more than one cross section. The profile type for fixed user-defined profiles is 998. SUB\_TYPE refers to the name of the cross section definition. When importing fixed user-defined profiles, the relevant cross section definitions must be in the same import file as the profile.

```
PROFILE_NAME = "TAN_HK_TEST_2_CS";
{
TYPE = 998; SUB_TYPE = 253; COORDINATE = 0.000;
{
"EQUIVALENT_TYPE"            11
"FLANGE_SLOPE_RATIO"          0.000000000E+000
"ECCENTRICITY_Y"              0.000000000E+000
"ECCENTRICITY_X"              0.000000000E+000
"ROUNDING_RADIUS_2"          0.000000000E+000
"FLANGE_THICKNESS_2"          0.000000000E+000
"WEB_THICKNESS_2"             0.000000000E+000
```

#### Cross section definitions

```
CROSS_SECTION_NAME = "MY_OWN_PROFILE"
POINT_NUMBER = 1;
POINT_X = 200.00;
POINT_Y = -200.00;
CHAMFER_TYPE = 0;
CHAMFER_X = 0.00;
CHAMFER_Y = 0.00;
POINT_NUMBER = 2;
POINT_X = 200.00;
POINT_Y = 200.00;
CHAMFER_TYPE = 0;
CHAMFER_X = 0.00;
CHAMFER_Y = 0.00;
```

See also [Exporting a profile catalog on page 175](#)

[Exporting a part of the profile catalog on page 176](#)

## Units used in import and export

The table below lists the units Tekla Structures uses when importing and exporting profile catalogs and material catalogs.

Type	Unit (if blank, no unit)
Boolean	
Integer	
String	
Ratio	
Strain	
Angle	degree
Length	mm
Deformation	mm
Dimension	mm
Radius of inertia	mm
Area	mm <sup>2</sup>
Reinforcement area	mm <sup>2</sup>
Transverse reinforcement area	mm <sup>2</sup> /m
Area/unit length	mm <sup>2</sup> /m
Volume	mm <sup>3</sup>
Section modulus	mm <sup>3</sup>
Moment of inertia	mm <sup>4</sup>
Torsion constant	mm <sup>4</sup>
Warping constant	mm <sup>6</sup>
Force	N
Weight	kg
Distributed load	N/m
Spring constant	N/m
Mass/length	kg/m
Surface load	N/m <sup>2</sup>
Strength	N/m <sup>2</sup>
Stress	N/m <sup>2</sup>
Modulus	N/m <sup>2</sup>
Density	kg/m <sup>3</sup>
Moment	Nm
Distributed moment	Nm/m

Type	Unit (if blank, no unit)
Rotation spring constant	Nm/rad
Temperature	K (°C)
Thermal dilation coefficient	1/K (1/°C)
Factor	

See also [Importing profile catalog items on page 174](#)

[Importing a material catalog on page 260](#)



[Exporting a profile catalog on page 175](#)

[Exporting a material catalog on page 261](#)

## Importing and exporting sketched profiles

To use a sketched profile in other Tekla Structures models, you have to export the profile to a file (\*.uel), and then import the file into another Tekla Structures model.

We recommend that you use the **Profile Catalog** to import and export sketched profiles. You can also use the **Component Catalog**. Sketched profiles have the following symbols and numbers in the component catalog:

	Name	Number	Keywords
	LPROF	-10000	
	MYSKETCH	-10000	

See also [Importing sketched profiles on page 179](#)

[Exporting sketched profiles on page 180](#)

### Importing sketched profiles

After you have exported sketched profiles to a file, you can import them to another Tekla Structures model.

To import sketched profiles:

1. Open the Tekla Structures model you want to import to.
2. Click **Modeling --> Profiles --> Profile Catalog...** to open the **Modify Profile Catalog** dialog box.
3. Click **Import...**
4. In the **Import Profile Catalog** dialog box, select \*.uel from the **Filter** list.
5. Select the file to import.
6. Click **OK**.

7. Click **OK** to close the **Modify Profile Catalog** dialog box.
8. Click **OK** in the **Save confirmation** dialog box to save the changes.



To automatically import all \*.uel files from a folder when creating a new model, use the advanced option XS\_UEL\_IMPORT\_FOLDER .

**See also** [Exporting sketched profiles on page 180](#)

XS\_UEL\_IMPORT\_FOLDER

### *Exporting sketched profiles*

To export sketched profiles:

1. Open the Tekla Structures model you want to export from.
2. Click **Modeling --> Profiles --> Profile Catalog...** to open the **Modify Profile Catalog** dialog box.
3. Right-click the profile you want to export and select **Export Profile...** from the pop-up menu.
4. In the **Export Profile Catalog** dialog box, enter a name for the export file in the **Selection** box.
5. If you want to save the export file to a specific location, browse for the folder.  
By default, Tekla Structures saves the export file in the current model folder.
6. Click **OK**.

**See also** [Importing sketched profiles on page 179](#)

## 8.4 Creating your own profiles

You can create your own profiles and save them in the profile catalog. Use any of the following methods to create user-defined profiles in Tekla Structures:

Profile type	Creation methods
Fixed profile	<ul style="list-style-type: none"><li>• <a href="#">Creating a fixed profile on page 187</a></li><li>• <a href="#">Creating a fixed profile by copying on page 189</a></li><li>• <a href="#">Creating a fixed profile based on a parametric profile on page 190</a></li></ul>
Parametric profile	<ul style="list-style-type: none"><li>• <a href="#">on page 0</a></li></ul>

Profile type	Creation methods
	<ul style="list-style-type: none"> <li>• <a href="#">Creating parametric profiles by sketching on page 191</a></li> </ul>
Parametric profile with variable cross sections	<ul style="list-style-type: none"> <li>• <a href="#">Creating parametric profiles with variable cross sections on page 212</a></li> </ul>

## Creating user-defined cross sections

User-defined cross sections can be used for creating fixed profiles. Define the needed cross sections before creating the profile. Use any of the following methods to define a cross section:

- [Defining a cross section using polygon on page 181](#)  
Use this method to create a cross section with fixed dimensions.
- [Defining a cross section using a plate on page 183](#)  
Use this method if you have a contour plate in the model.
- [Defining a cross section using a DWG file on page 184](#)  
Use this method if you have a .dwg file of the profile you want to define.

See also [Creating fixed profiles on page 187](#)

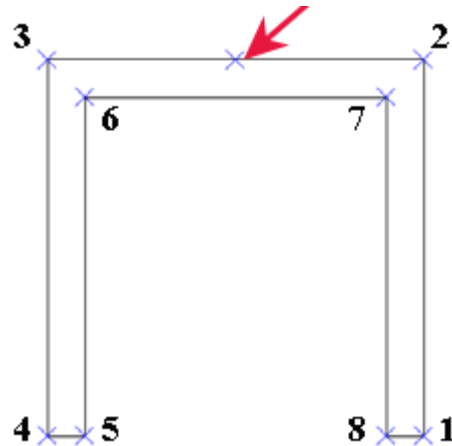
### *Defining a cross section using polygon*

Define a cross section by picking the shape of the cross section.

To define a cross section using polygon:

1. Click **Modeling --> Profiles --> Define Cross Section Using Polygon**.
2. Define a cross section without or with inner contours.
  - To create a cross section with no inner contours:
    1. Pick the corner points of the cross section to define the shape. Start at the bottom-right corner and pick the points counter clockwise.
    2. Pick the start point and click the middle mouse button to close the shape.

3. Pick the center point of the cross section.



---

To make it easier to define the shape, insert a reference model of the cross section in the model, and use the reference model as a basis for picking the cross section shape.



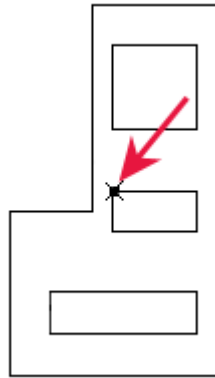
Alternatively, you can create a few construction lines or points in the model and use them to define the cross section shape.

If you do not have any actual points to pick, picking the center point of the cross section becomes difficult. This is because the cross section shape disappears after you have clicked the middle mouse button to close the shape.

---

- To create a cross section with inner contours:
  1. Pick the corner points of the cross section to define the shape.
  2. Pick the start point to close the shape.
  3. Pick the corner points of the cross section inner contour.
  4. Pick the start point to close the shape
  5. Repeat until you have picked all inner contours.
  6. Click the middle mouse button.

7. Pick the center point of the cross section.



3. When the **User Profile Cross Section** dialog box appears, enter a name for the cross section.
4. Click **OK** to close the **User Profile Cross Section** dialog box.
5. Click **OK** in the **Save confirmation** dialog box to save the changes.

You can now use the cross section in the profile catalog to create a new profile. The **Profile type** will be **User-defined, fixed**.

See also [Creating a fixed profile on page 187](#)

[Modifying a user-defined cross section on page 186](#)

[Defining a cross section using a plate on page 183](#)

[Defining a cross section using a DWG file on page 184](#)

### ***Defining a cross section using a plate***

You can define a cross section using a contour plate.

To define a cross section using a plate:

1. Create a contour plate that includes all the chamfers.  
Make sure the cross section does not have more than 99 corner points. Typically rounded shapes consist of many corner points. If needed, you can round the chamfers afterwards.
2. Click **Modeling --> Profiles --> Define Cross Section Using Plate...** .  
The **Profile Cross-Section from Plate (10)** dialog box appears.
3. On the **Parameters** tab, enter a name in the **Section name** and **Profile name** boxes.  
Other properties are optional.
4. Click **OK**.
5. Select the contour plate.

Tekla Structures creates the cross section with the shape of the contour plate.

You can now use the cross section in the profile catalog to create a new profile. The **Profile type** will be **User-defined, fixed**.

See also [Creating a fixed profile on page 187](#)

[Properties: Profile cross-section from plate \(10\) on page 184](#)

[Defining a cross section using polygon on page 181](#)

[Defining a cross section using a DWG file on page 184](#)

**Properties: Profile cross-section from plate (10)**

Use the **Parameters** tab to define the profile properties in the **Profile cross-section from plate (10)** modeling tool.

Option	Description
<b>Section name</b>	Name of the cross section shown in the <b>Modify Profile Catalog</b> dialog box. If you leave this box empty, no profile is created.
<b>Profile name</b>	Name of the profile shown in the <b>Beam Properties</b> dialog box, and in the <b>Modify Profile Catalog</b> dialog box. If you leave this box empty, no profile is created.
<b>Save to</b>	The location of the profile catalog. Select one of the following options: <ul style="list-style-type: none"><li>• <b>Model directory:</b> The current model folder.</li><li>• <b>Global directory:</b> ..\ProgramData\Tekla Structures\&lt;version&gt;\environments\&lt;environment&gt;\profil</li><li>• <b>Don't save:</b> Does not save the profile. This is useful for testing.</li></ul>
<b>Min distance between points</b>	The minimum distance between the corner points of the cross section. To create simpler drawings of complicated cross sections, increase this value.
<b>Center point offset</b>	The origin of the plate defines the location of the profile reference line. Enter an offset value to move the reference line, relative to the cross section.

See also [Defining a cross section using a plate on page 183](#)



### ***Defining a cross section using a DWG file***

If a cross section is available in DWG format, you can import the cross section and add it as a DWG profile to the profile catalog. Tekla Structures supports DWG files that have been created using version ACAD2010 or earlier.

Before you start defining a cross section using a DWG file:

- Save the outline of the cross section as a DWG file. Ensure that the DWG file only contains the outline of the profile.
- Make sure that the cross section is created as a closed polyline.
- Make sure that the outline consists of only one closed polyline. You cannot, for example, define holes to your cross section with this method. If you need holes or openings, use the polygon or the plate creation method.
- Remove hatching and unnecessary lines from the DWG file. Tekla Structures imports all the lines it finds in the DWG file.
- Make sure the cross section does not have more than 99 corner points. Typically rounded shapes consist of many corner points. If needed, you can round the chamfers afterwards.
- If there are blocks in the DWG file, they must be exploded.

To define a cross section using a DWG file:

1. Open a model.
2. Click **Modeling --> Profiles --> Define Cross Section Using DWG File...** .

The **DWG Profile to Library** dialog box appears.

3. Define cross section properties and click **OK**.
4. In the model, pick the start and the end points of the cross section to be imported.

Tekla Structures imports the cross section and places the profile reference line at the origin of the DWG file.

You can now use the cross section in the profile catalog to create a new profile. The **Profile type** will be **User-defined, fixed**.

**See also** [Creating a fixed profile on page 187](#)

[Properties: DWG Profile to Library \(6\) on page 185](#)

[Defining a cross section using polygon on page 181](#)

[Defining a cross section using a plate on page 183](#)

#### **Properties: DWG Profile to Library (6)**

Use the **Parameters** tab to define the profile properties in the **DWG profile to library (6)** modeling tool.

Option	Description
Input file	Browse for the DWG file to be imported.

Option	Description
<b>Section name</b>	Name of the cross section shown in the <b>Modify Profile Catalog</b> dialog box.
<b>Profile name</b>	Name of the profile shown in the <b>Modify Profile Catalog</b> dialog box.
<b>Save to</b>	The location of the profile catalog. Select one of the following options: <ul style="list-style-type: none"> <li>• <b>Model directory:</b> The current model folder.</li> <li>• <b>Global directory:</b> ..\ProgramData\Tekla Structures\&lt;version&gt;\environments\&lt;environment&gt;\profil</li> <li>• <b>Don't save:</b> Does not save the profile. This is useful for testing.</li> </ul>
<b>Min distance between points</b>	The minimum distance between the corner points of the cross section. To create simpler drawings of complicated cross sections, increase this value.
<b>Center point offset</b>	The origin of the plate defines the location of the profile reference line. Enter an offset value to move the reference line, relative to the cross section.

See also [Defining a cross section using a DWG file on page 184](#)

### ***Modifying a user-defined cross section***

You can modify cross sections that have been defined using a polygon, a plate, or a DWG file.

To modify an existing cross section:

1. Click **Modeling --> Profiles --> Edit Polygon Cross Section...** to open the **Modify Cross Section** dialog box.
2. Select the cross section you want to modify.
3. Modify the cross section point properties.
  - **Number** refers to each point picked when the cross section was created, in numerical order. The first point picked is 1, the second 2, and so on.
  - **Chamfer** refers to the chamfer shape.
  - **x:** and **y:** apply to the chamfer type. For example, if you want the chamfer to be equal on both sides of the angle, only enter a value for **x:**.  
For an uneven chamfer, enter values for **x:** and **y:**.
4. Click **Update**.
5. Click **OK** to close the **Modify Cross Section** dialog box.
6. Click **OK** in the **Save confirmation** dialog box to save the changes.



If you want to delete a cross section, select the cross section and click **Delete**.

---

**See also** [Defining a cross section using polygon on page 181](#)  
[Defining a cross section using a plate on page 183](#)  
[Defining a cross section using a DWG file on page 184](#)

## Creating fixed profiles

You can create new fixed profiles either from scratch or by copying an existing one. You can also convert a parametric profile into a fixed one.

Click the links below to find out more:

- [Creating a fixed profile on page 187](#)
- [Creating a fixed profile by copying on page 189](#)
- [Creating a fixed profile based on a parametric profile on page 190](#)
- [Modifying a fixed profile on page 190](#)

### *Creating a fixed profile*

You can create fixed profiles with a single cross section or with multiple cross sections. Note that cross sections affect the total weight of the profile.



If you create a profile with multiple cross sections, create the cross sections with the same number of corner points and in the same order.

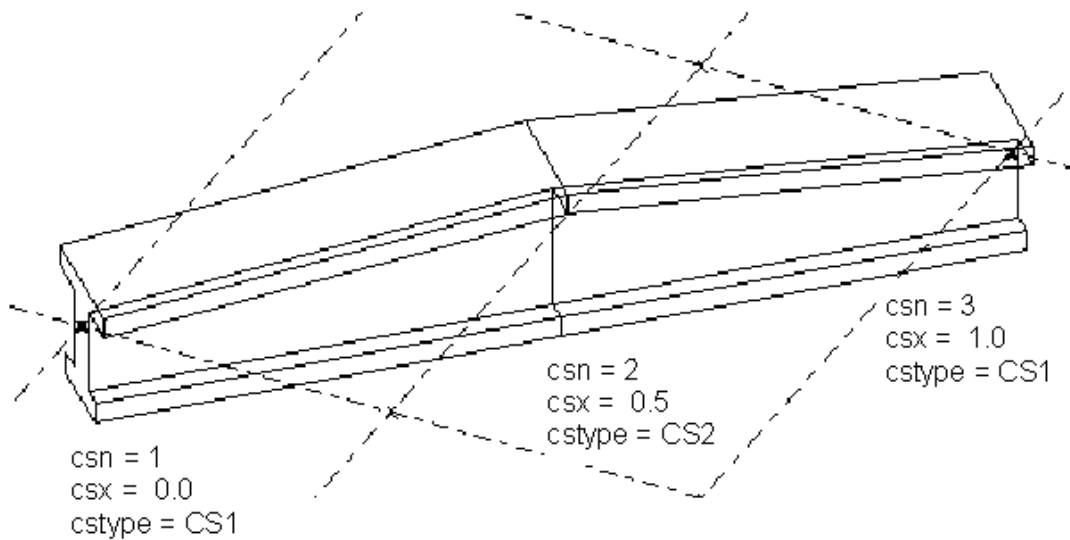
---

To create a new fixed profile:

1. Click **Modeling --> Profiles --> Profile Catalog...** to open the **Modify Profile Catalog** dialog box.
2. Right-click anywhere in the profile tree and select **Add Profile**.  
A new fixed profile with the name **PROFILE1** is created.
3. Change the profile name by entering a new name in the **Profile name** box.  
The profile name must be in upper case letters, with no spaces. Tekla Structures automatically converts lower case letters to upper case letters.
4. In the **Profile type** list, select **User-defined, fixed**.

5. In the **Profile subtype** list, select the cross section you want to use.  
If you have created your own user-defined cross sections, you can use one of them.
6. Under **Equivalent type**, select a profile type that matches the new cross section as closely as possible. This is important because some connections only work for certain types of profiles.  
  
The equivalent type and the profile dimensions, such as height and width, affect which connections can be applied to the profile. An unsuitable equivalent type or missing dimension values may result in problems with connections.
7. Click **Update**.
8. Modify the dimension values.  
  
Always enter values for the dimensions **Height h** and **Width b**, as these values affect how Tekla Structures displays the profiles. If the values are 0, the part is drawn as a line.
9. Under **Cross section**, define a relative location for each cross section:
  - a. In the **Number** list, select the number of the cross section.
  - b. In the **Relative location** box, enter the location of the cross section.  
  
This value indicates the location of the cross section along the axis: 0.0 for the start end and 1.0 for the second end. If you only have a single cross section, select 1 for **Number** and enter 0 . 000 for **Relative location**.
  - c. Click **Update** after defining each cross section.
10. Click **Add** to add more cross sections, if needed.
11. If you want to use a different cross section in the profile, select a new one from the **Profile subtype** list.
12. If you want to remove a cross section, select the cross section from the **Number** list and click **Remove**.
13. Click **OK** to close the **Modify Profile Catalog** dialog box.
14. Click **OK** in the **Save confirmation** dialog box to save the changes.

**Example** For a pitched profile, you need two cross sections with the same center point height. The **Relative location** value is 0 . 0 for the first cross section, 0 . 5 for the second cross section, and 1 . 0 for the third cross section.



See also [Creating a fixed profile by copying on page 189](#)  
[Modifying a fixed profile on page 190](#)  
[Deleting a profile on page 173](#)  
[Creating user-defined cross sections on page 181](#)

### ***Creating a fixed profile by copying***

You can create new fixed profiles by modifying a copy of an existing, similar profile.

To copy a fixed profile:

1. Click **Modeling** --> **Profiles** --> **Profile Catalog...** to open the **Modify Profile Catalog** dialog box.
2. Select a fixed profile that is similar to the one you wish to create.
3. Right-click and select **Copy Profile**.

A new profile with the name **<existing\_profile\_name COPY>** is created.

4. Change the profile name by entering a new name in the **Profile name** box.

The profile name must be in upper case letters, with no spaces. Tekla Structures automatically converts lower case letters to upper case letters.

5. Modify the profile properties.

---

Under **Equivalent type**, select a profile type that matches the new cross section as closely as possible. This is important because some connections only work for certain types of profiles.



Always enter values for the dimensions **Height h** and **Width b**, as these values affect how Tekla Structures displays the profiles. If the values are 0, the part is drawn as a line.

The equivalent type and the profile dimensions, such as height and width, affect which connections can be applied to the profile. An unsuitable equivalent type or missing dimension values may result in problems with connections.

---

6. Click **Update**.
7. Click **OK** to close the **Modify Profile Catalog** dialog box.
8. Click **OK** in the **Save confirmation** dialog box to save the changes.

See also [Creating a fixed profile on page 187](#)  
[Modifying a fixed profile on page 190](#)

### ***Creating a fixed profile based on a parametric profile***

To create a standard fixed profile based on a parametric profile:

1. Click **Modeling --> Profiles --> Profile Catalog...** to open the **Modify Profile Catalog** dialog box.
2. Select a parametric profile from the list.
3. Right-click and select **Add Profile**.


A new standard fixed profile is created, and it has the profile values of the parametric profile.

See also [Creating fixed profiles on page 187](#)

### ***Modifying a fixed profile***

If necessary, you can modify existing fixed profiles using the profile catalog. Note that the fixed profiles conform to industry standards, and you should not modify them unless you are an administrator.

To modify an existing profile:

1. Click **Modeling --> Profiles --> Profile Catalog...** to open the **Modify Profile Catalog** dialog box.
2. Select a fixed profile  in the tree and modify its properties.

- The **General** tab contains information on profile types and dimensions.
  - The **Analysis** tab contains information on the properties used in structural analysis. The structure can be analyzed with different analysis software.
  - The **User attributes** tab is for viewing or entering user attributes for profiles.
3. When you have finished modifying the profile, click **Update**.
  4. Click **OK** to close the **Modify Profile Catalog** dialog box.  
Tekla Structures asks if you want to save the changes to the model folder.
  5. Click **OK** in the **Save confirmation** dialog box to save the changes.

**See also** [Creating a fixed profile on page 187](#)

[Creating a fixed profile by copying on page 189](#)

## Creating parametric profiles by sketching

This section explains how to create parametric user-defined profiles by sketching. You can change the dimensions of parametric profiles each time you use them in a model.

Click the links below to find out more:

- [Opening the sketch editor on page 191](#)
- [Sketching the outline of a profile on page 194](#)
- [Refining the shape of a sketched profile on page 196](#)
- [Adding dimensions to a sketched profile on page 199](#)
- [Defining positioning planes for a sketched profile on page 203](#)
- [Checking a sketched profile on page 207](#)
- [Saving a sketched profile on page 207](#)
- [Modifying a sketched cross section on page 208](#)
- [Using sketched profiles in a model on page 211](#)
- [on page 0](#)

### *Opening the sketch editor*

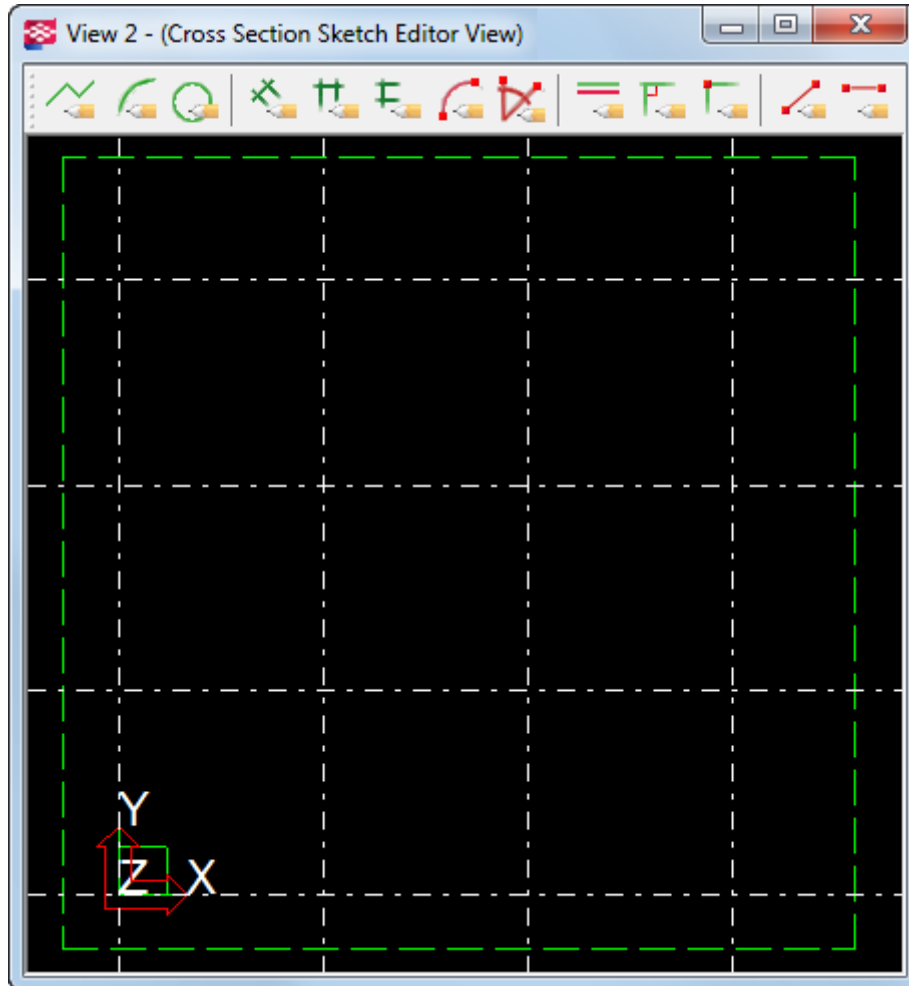
Use the sketch editor to create and modify sketched profiles.

To open the sketch editor:

1. Open a Tekla Structures model.
2. Click **Modeling --> Profiles --> Define Cross Section in Sketch Editor...**

Tekla Structures opens the sketch editor, the **Sketch Browser**, and the **Variables** dialog box.

When you first open the sketch editor, the view is empty. The grid coordinates and labels that you see in the sketch editor depend on the grid properties of your actual Tekla Structures model.



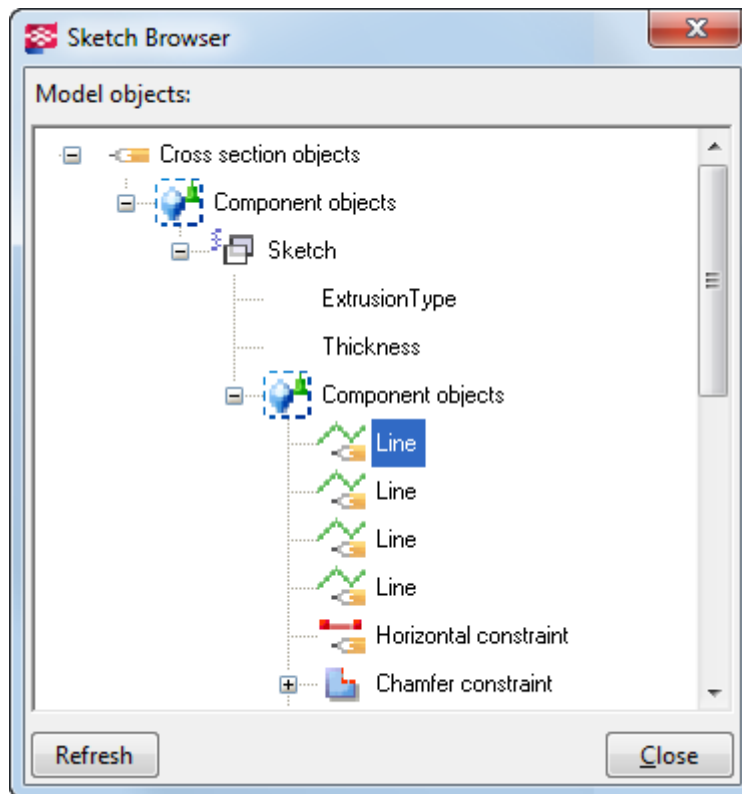
See also [Sketch Browser on page 192](#)  
[Variables in sketched profiles on page 193](#)

#### Sketch Browser

The **Sketch Browser** shows the objects (lines, arcs, circles, constraints, dimensions, and chamfers) of a sketched profile in a hierarchical, tree-like structure. The **Sketch Browser** automatically opens when you open the sketch editor.



When you click an object in the sketch editor, Tekla Structures highlights the object in the **Sketch Browser**, and vice versa.



The **Sketch Browser** displays the following information about a sketched profile:

- Extrusion type (0, 1, or 2) and thickness of the sketched profile
- Lines, arcs, and circles
- Constraints
- Distances and dimensions and their values
- Chamfers and their type (0=**None**, 1=**Line** ... 7=**Line and arc**) and dimensions.

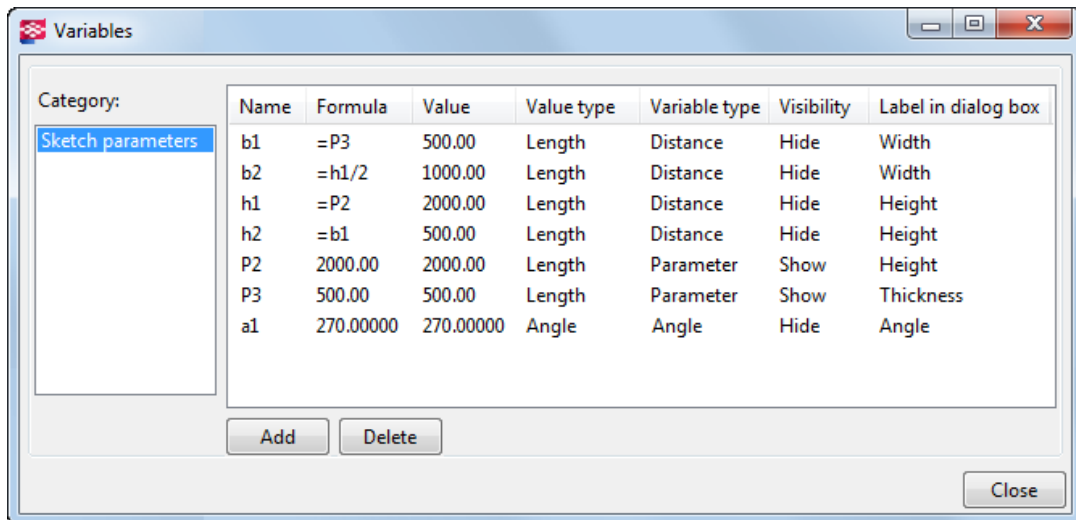
See also [Opening the sketch editor on page 191](#)

[Extrusion types on page 211](#)

#### **Variables in sketched profiles**

Use the **Variables** dialog box to define the properties of a sketched profile. Variables can define fixed properties, or they can include formulas, so that Tekla Structures calculates the property value each time you use the profile in a model.

The **Variables** dialog box automatically opens when you open the sketch editor.



The **Variables** dialog box functions the same way as the corresponding dialog box in the custom component editor. For more information on how to use variables, see .

See also [Opening the sketch editor on page 191](#)

### ***Sketching the outline of a profile***

When you create a new sketched profile, start by sketching the outline and the holes of the profile using lines, arcs, and circles.

Ensure that you create a closed shape, unless you are creating a profile of a consistent thickness, such as a cold-rolled profile.

The maximum number of points in a sketched profile is 100.

See also [Sketching a polyline on page 194](#)

[Sketching an arc on page 195](#)


[Sketching a circle on page 195](#)

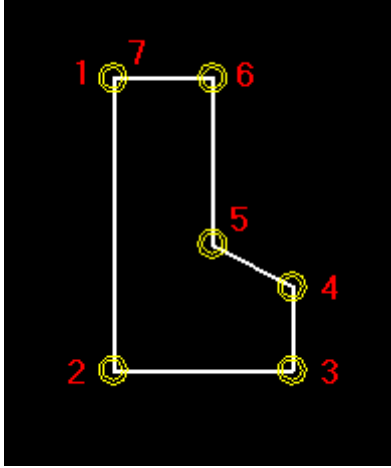
### **Sketching a polyline**

You can create line segments in the sketch editor by picking points. Tekla Structures automatically creates coincident constraints between the line segments and displays a chamfer symbol where line segments meet.

To sketch a polyline:

1. Open the sketch editor.

2. Click the **Sketch polyline** button: .
3. Pick points to create each line segment.
4. Click the middle mouse button to create the polyline.




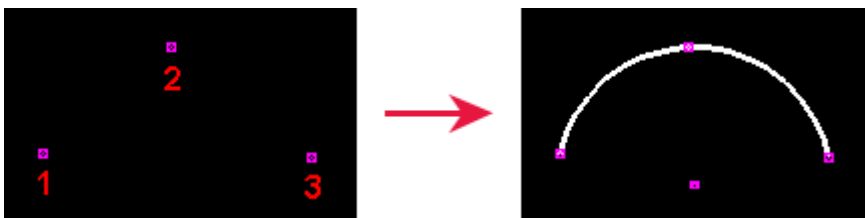
See also [Sketching the outline of a profile on page 194](#)

#### Sketching an arc

You can create an arc in the sketch editor by picking three points.

To sketch an arc:

1. Open the sketch editor.
2. Click the **Sketch arc** button: .
3. Pick three points to define the arc.




You can use the advanced option `XS_CS_CHAMFER_DIVIDE_ANGLE` to define the smoothness of the arc.

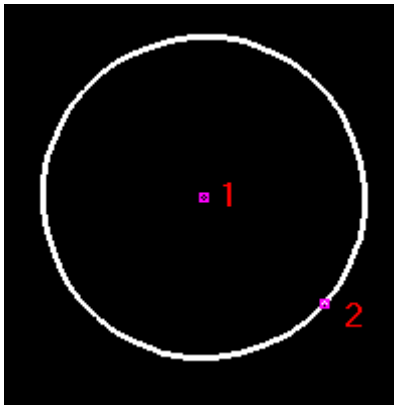
See also [Sketching the outline of a profile on page 194](#)

### Sketching a circle

You can create a circle in the sketch editor by picking two points.

To sketch a circle:

1. Open the sketch editor.
2. Click the **Sketch circle** button: .
3. Pick a point to indicate the center of the circle (1).
4. Pick a point to indicate the radius of the circle (2).



See also [Sketching the outline of a profile on page 194](#)

### *Refining the shape of a sketched profile*

After you have sketched the outline of a profile, use *constraints* to refine your sketch and lock the shape. For example, you can straighten lines, create 90 degree angles, force lines to meet, close the shape, and add chamfers in corners.

To straighten the entire profile, use horizontal and vertical constraints in conjunction with other constraints. Although the shape is locked, you can still rotate the profile in the model.

See also [Adding a parallel constraint on page 196](#)

[Adding a perpendicular constraint on page 197](#)

[Adding a coincident constraint on page 197](#)

[Adding a fixed constraint on page 198](#)

[Adding a horizontal constraint on page 198](#)

[Adding a vertical constraint on page 199](#)


[Deleting a constraint on page 199](#)

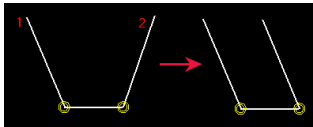
### **Adding a parallel constraint**

You can force two lines in a sketched profile to be parallel to each other.

Before you start, sketch the outline of the profile in the sketch editor.

To add a parallel constraint:

1. Click the **Parallel constraint** button: .
2. Select a line in the sketch (1).
3. Select another line in the sketch (2).




See also [Refining the shape of a sketched profile on page 196](#)

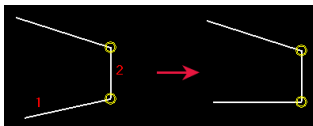
#### **Adding a perpendicular constraint**

You can force a line in a sketched profile to be at a 90 degree angle to another line you select. The lines do not have to intersect.

Before you start, sketch the outline of the profile in the sketch editor.

To add a perpendicular constraint:

1. Click the **Perpendicular constraint** button: .
2. Select a line in the sketch (1).
3. Select another line in the sketch (2).



See also [Refining the shape of a sketched profile on page 196](#)

#### **Adding a coincident constraint**

You can force two lines in a sketched profile to start or end at the same point, by extending or shortening one or both lines. The lines do not have to intersect.

---



Tekla Structures automatically creates coincident constraints:

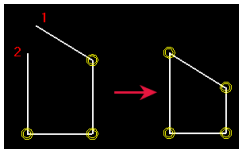


- Where two lines meet.
  - Between line segments when you draw them with the **Sketch polyline** tool.
  - Between the start of the first line segment and the end of the last line segment in a shape, if they are within a certain distance of each other.
-

Before you start, sketch the outline of the profile in the sketch editor.

To add a coincident constraint:

1. Ensure that the **Snap to end points**  snap switch is active.
2. Click the **Coincident constraint** button: .
3. Pick the end of the first line (1).
4. Pick the end of the second line. (2)




**See also** [Refining the shape of a sketched profile on page 196](#)

#### **Adding a fixed constraint**

You can lock the position and angle of a line in a sketched profile so that other constraints do not affect it.

Before you start, sketch the outline of the profile in the sketch editor.

To add a fixed constraint:

1. Click the **Fixed constraint** button: .
2. Select a line in the sketch.


**See also** [Refining the shape of a sketched profile on page 196](#)

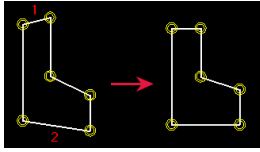
#### **Adding a horizontal constraint**

Use horizontal constraints to force a line in a sketched profile to be parallel to the local x axis. Tekla Structures automatically creates horizontal constraints when you create lines that are nearly horizontal.

Before you start, sketch the outline of the profile in the sketch editor.

To add a horizontal constraint:

1. Click the **Horizontal constraint** button: .
2. Select the lines you want to straighten (1, 2).




See also [Refining the shape of a sketched profile on page 196](#)

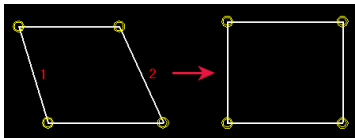
#### Adding a vertical constraint

Use vertical constraints to force a line in a sketched profile to be parallel to the local y axis. Tekla Structures automatically creates vertical constraints when you create lines that are nearly vertical.

Before you start, sketch the outline of the profile in the sketch editor.

To add a vertical constraint:


1. Click the **Vertical constraint** button: 
2. Select the lines you want to straighten (1, 2).



See also [Refining the shape of a sketched profile on page 196](#)

#### Deleting a constraint

To delete a constraint from a sketched profile:

1. Click  to open the **Sketch Browser**.
2. Select the constraint you want to delete.
3. Right-click and select **Delete** from the pop-up menu.
4. Click **Refresh**.

See also [Refining the shape of a sketched profile on page 196](#)

#### *Adding dimensions to a sketched profile*

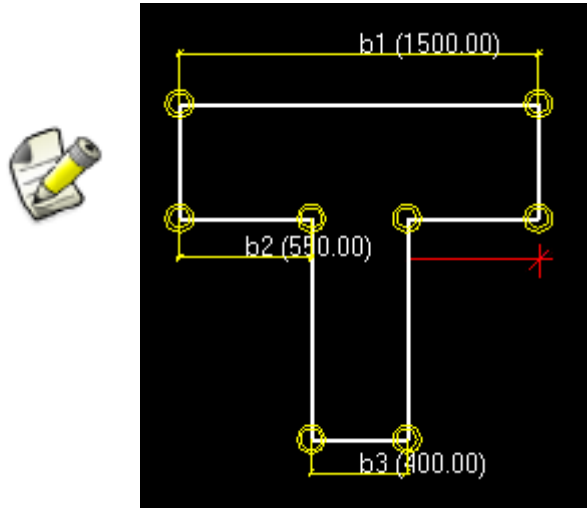
After you have sketched a profile, use dimensions to make different distances in the profile parametric. You can use these dimensions to define the size of the profile when you use it in a model.

Tekla Structures also adds the dimensions you create to the list of variables that you can use in calculations.

---

Do not create too many dimensions in a sketch, or the dimensions will not be able to adjust when the values are changed.

In the following example, if you create the dimension marked in red, the dimension b1 will no longer work:



---


**See also** [Adding a radial dimension to a sketch on page 200](#)  
[Adding an angle dimension to a sketch on page 201](#)  
[Adding a dimension between two points in a sketch on page 201](#)  
[Adding a horizontal dimension to a sketch on page 201](#)  
[Adding a vertical dimension to a sketch on page 202](#)  
[Deleting a dimension from a sketch on page 202](#)

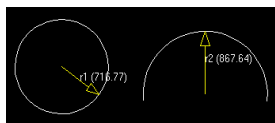
#### **Adding a radial dimension to a sketch**

You can create a radial dimension for an arc or a circle in a sketched profile.

Before you start, sketch the outline of the profile in the sketch editor.

To add a radial dimension:

1. Click the **Sketch radial dimension** button: .
2. Select the arc or circle.






See also [Adding dimensions to a sketched profile on page 199](#)

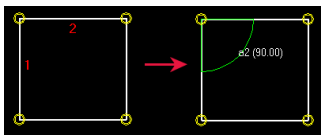
#### Adding an angle dimension to a sketch

You can create an angle dimension between two lines in a sketched profile. The angle is calculated counter clockwise from the first line you select.

Before you start, sketch the outline of the profile in the sketch editor.

To add an angle dimension:

1. Click the **Sketch angle dimension** button: .
2. Select the first line (1).
3. Select the second line (2).



If you are unable to see the angle symbol, scroll with the mouse wheel to zoom in.


See also [Adding dimensions to a sketched profile on page 199](#)

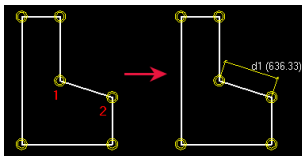
#### Adding a dimension between two points in a sketch

You can add a dimension to a sketched profile, between two points you pick.

Before you start, sketch the outline of the profile in the sketch editor.

To add a dimension between two points in a sketch:

1. Click the **Sketch free dimension** button: .
2. Pick a point to indicate the start point of the dimension (1).
3. Pick a point to indicate the end point of the dimension (2).
4. Pick a point to indicate the location of the dimension lines and text.



See also [Adding dimensions to a sketched profile on page 199](#)


### Adding a horizontal dimension to a sketch

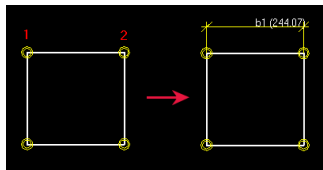
You can add a horizontal dimension to a sketched profile, between two points you pick.

Before you start, sketch the outline of the profile in the sketch editor.

To add a horizontal dimension to a sketch:



1. Click the **Sketch horizontal dimension** button: .
2. Pick a point to indicate the start point of the dimension (1).
3. Pick a point to indicate the end point of the dimension (2).
4. Pick a point to indicate the location of the dimension lines and text.



See also [Adding dimensions to a sketched profile on page 199](#)


### Adding a vertical dimension to a sketch

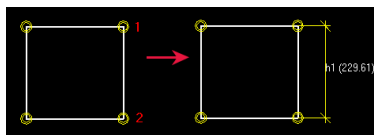
You can add a vertical dimension to a sketched profile, between two points you pick.

Before you start, sketch the outline of the profile in the sketch editor.

To add a vertical dimension to a sketch:



1. Click the **Sketch vertical dimension** button: .
2. Pick a point to indicate the start point of the dimension (1).
3. Pick a point to indicate the end point of the dimension (2).
4. Pick a point to indicate the location of the dimension lines and text.



See also [Adding dimensions to a sketched profile on page 199](#)

### Deleting a dimension from a sketch

To delete a dimension from a sketched profile:

1. Select the dimension you want to delete.
2. Right-click and select **Delete** from the pop-up menu.

See also [Adding dimensions to a sketched profile on page 199](#)

### ***Defining positioning planes for a sketched profile***

When you sketch a profile, you can define *positioning planes* for it. With positioning planes you can determine the planes Tekla Structures will use for positioning parts and components.

See also [Part positioning planes on page 203](#)

[Connection positioning planes on page 204](#)

[Showing and hiding positioning planes on page 205](#)

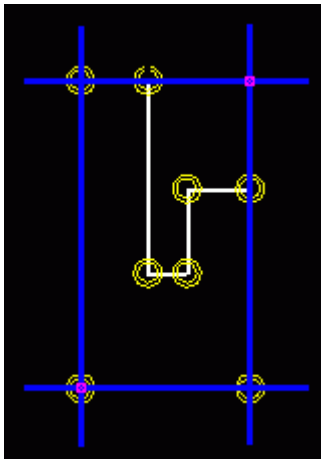
[Moving positioning planes on page 205](#)

[Reverting to default positioning planes on page 207](#)

### **Part positioning planes**

With part positioning planes you can determine how Tekla Structures positions parts that have a sketched profile. These planes are used for the **On plane** and **At depth** settings for parts, and also when placing custom components that are bound to boundary planes.

The part positioning planes are displayed in blue:

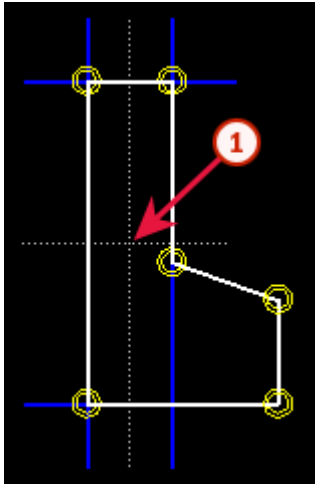


The **On plane** options **Left** and **Right** are set according to the vertical blue planes, and the **Middle** option is halfway between them.

The same principle applies to the **At depth** setting: the **Front** and **Behind** options are set according to the horizontal blue planes, and the **Middle** option is halfway between them.

Position		
<input checked="" type="checkbox"/> On plane:	Middle ▼	0.00
<input checked="" type="checkbox"/> Rotation:	Top ▼	-0.00000
<input checked="" type="checkbox"/> At depth:	Middle ▼	-0.00

**Example** You can define part positioning planes so that an asymmetric profile will be positioned according to its web only. In the following example, the **Middle** option is illustrated in gray dotted lines:



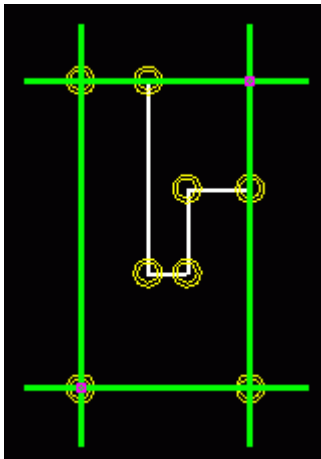
**1** Middle option

**See also** [Defining positioning planes for a sketched profile on page 203](#)

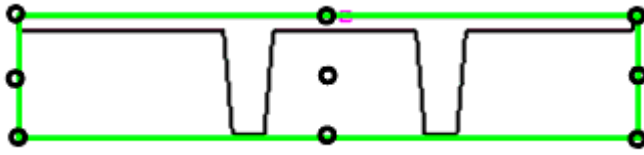
#### Connection positioning planes

With *connection positioning planes* you can determine how Tekla Structures positions components in relation to the component main part that has a sketched profile.

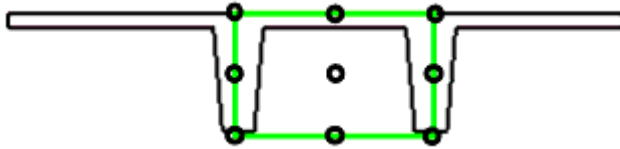
The connection positioning planes are displayed in green:



**Example** The following image shows the default connection positioning planes of a double tee slab that was created as a sketched profile. The green line illustrates the default connection positioning planes.





To place connections according to the location of the stems of the double tee, move the connection positioning planes as shown below.



See also [Defining positioning planes for a sketched profile on page 203](#)

#### Showing and hiding positioning planes

To show or hide the positioning planes, do one of the following:

To	Do this
Show or hide <b>part</b> positioning planes	Click  .
Show or hide <b>connection</b> positioning planes	Click  .

See also [Defining positioning planes for a sketched profile on page 203](#)

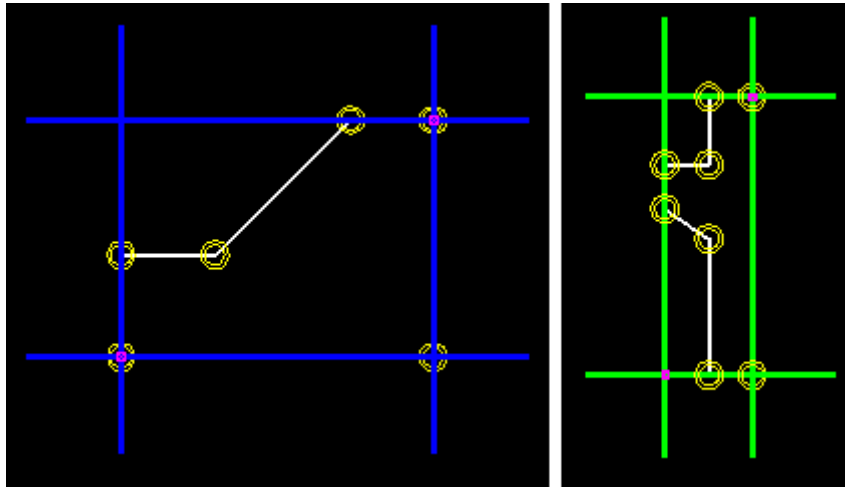
#### Moving positioning planes

You can move the positioning planes by moving their handles. Note that if you move the handles away from the outmost corners of the sketched profile, you must bind them by adding a dimension to each handle. Otherwise the positioning will not function correctly in the model.

To move the positioning planes:

1. Click the positioning plane to display the handles.

The handles are displayed in pink. By default, the handles are at the outmost corners of the sketched profile. For example:



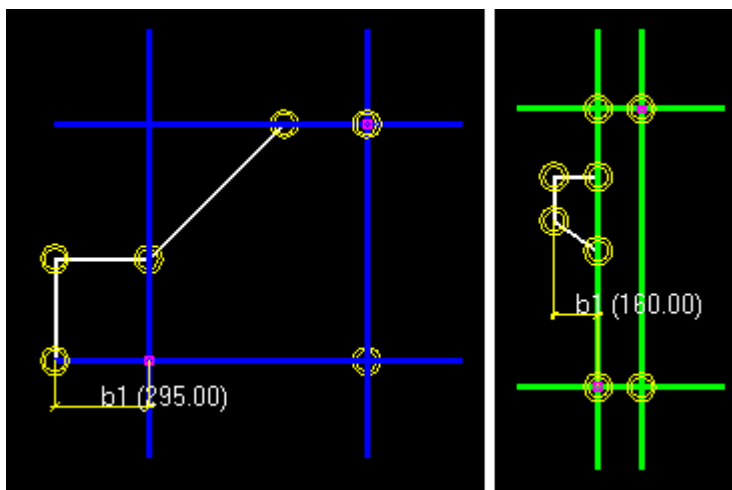
2. Click a handle to select it.



The same handle controls both the vertical and horizontal plane, so you can move them both at the same time.

3. Move the handle like any other object in Tekla Structures.  
For example, right-click and select **Move**.
4. If the handle is not at the outmost corner of the profile, add a dimension between the handle and the corner.

**Example** In the following examples, the left handle of the positioning plane has been bound by using a horizontal dimension (b1):







See also [Defining positioning planes for a sketched profile on page 203](#)

[Showing and hiding positioning planes on page 205](#)

### Reverting to default positioning planes

You can revert back to the default positioning planes of a sketched profile if you have moved the planes.

To revert to the default positioning planes, do one of the following:

To	Do this
Revert to the default <b>part</b> positioning planes	<ol style="list-style-type: none"><li>1. Click  to show the part positioning planes.</li><li>2. Select the part positioning planes.</li><li>3. Right-click and select <b>Delete</b> from the pop-up menu.</li><li>4. Click  again to check that the planes have reverted back to the default.</li></ol>
Revert to the default <b>connection</b> positioning planes	<ol style="list-style-type: none"><li>1. Click  to show the connection positioning planes.</li><li>2. Select the connection positioning planes.</li><li>3. Right-click and select <b>Delete</b> from the pop-up menu.</li><li>4. Click  again to check that the planes have reverted back to the default.</li></ol>

See also [Defining positioning planes for a sketched profile on page 203](#)

### Checking a sketched profile

To check that the constraints and dimensions in a sketched profile work correctly:

1. Double-click a dimension line to open the **Distance Properties** dialog box.
2. Change the **Value** box.
3. Click **Modify**.  
Tekla Structures updates the profile in the sketch editor.
4. Check that the shape of the profile does not change and that the dimensions adjust correctly.
5. Click **Cancel** to close the **Distance Properties** dialog box.

See also [Using sketched profiles in a model on page 211](#)

### ***Saving a sketched profile***

Tekla Structures saves the sketched profiles in the current model folder, in the `xslib.db1` file, which is a library file containing custom components and sketches. Sketched profiles are available in the **Others** section in the profile catalog.

---




Note the following limitations when naming sketched profiles:



- You cannot use the name of a fixed profile.
- You cannot include numbers, special characters, or blank spaces in the profile name.
- Lower case letters are automatically converted into upper case letters.

---

To save a sketched profile, do one of the following:

To	Do this
Save a new profile	<ol style="list-style-type: none"><li>1. Click <b>Save sketch</b> .</li><li>2. Enter a name in the <b>Prefix</b> box, and then click <b>OK</b>.</li></ol>
Update an existing profile	<ol style="list-style-type: none"><li>1. Click <b>Save sketch</b> .</li><li>2. Click <b>Yes</b> when prompted to update the existing cross section.</li></ol>
Save a copy of the profile under a different name	<ol style="list-style-type: none"><li>1. Click <b>Save sketch as</b> .</li><li>2. Enter a new name in the <b>Prefix</b> box, and then click <b>OK</b>.</li></ol>

See also [Importing and exporting sketched profiles on page 179](#)

### ***Modifying a sketched cross section***

You can modify existing sketched profiles, for example, by modifying chamfers or dimensions. You can also move corners or holes by moving the handles. The chamfers are moved automatically when you move the handles.




- You cannot change dimensions that have been calculated using formulas in the **Variables** dialog box.
- Constraints may also prevent you from changing dimensions.

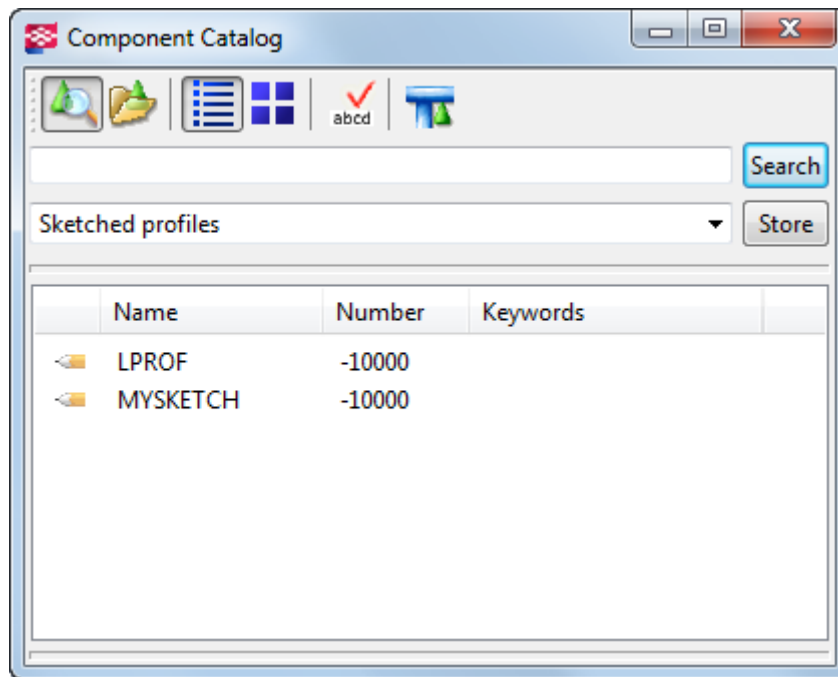
---


To modify a sketched profile:

1. Press **Ctrl + F** to open the **Component Catalog**.



Existing profiles are listed in the **Sketched profiles** folder. Sketched profiles have the symbol  next to their name.



2. Double-click a sketched profile to open it in the sketch editor.
3. Double-click a sketch object to modify its properties.  
The sketch objects you can modify appear in yellow.
4. Modify the properties and then click **Modify**.
5. Close the sketch object properties dialog box.
6. Click the **Save sketch as** button  to save the changes.


**See also** [Modifying chamfers in a sketch on page 209](#)

[Setting the sketch thickness on page 210](#)

#### **Modifying chamfers in a sketch**

You can change the shape and dimensions of chamfers in a sketched profile. For example, you can create rounded profile corners.

To modify a chamfer:

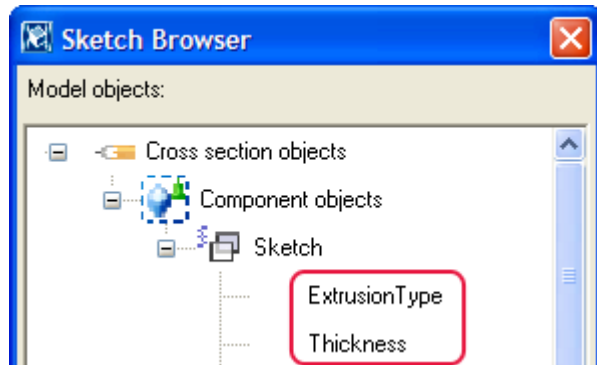
1. Double-click a chamfer symbol  in the sketch editor.
2. In the **Chamfer Properties** dialog box, change the shape and dimensions of the chamfer.
3. Click **Modify**.
4. Click **OK** to close the dialog box.

5. Click the **Save sketch as** button  to save the changes.


See also [Modifying a sketched cross section on page 208](#)

### Setting the sketch thickness

If you have sketched an open shape, such as a cold-rolled section, you must define the extrusion type and thickness of the sketch in the **Sketch Browser**. The thickness can be either fixed or parametric.



To set the thickness of a sketch:

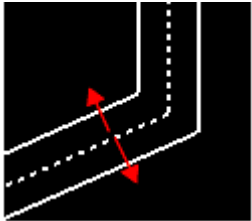
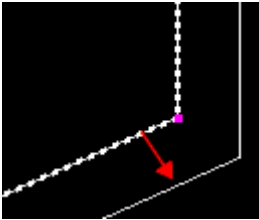
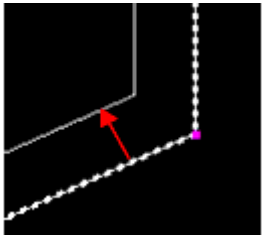
1. In the sketch editor, sketch an open polyline.
2. Do one of the following:
  - To set a fixed thickness:
    1. In the **Sketch Browser**, right-click **Thickness** and select **Add Equation** from the pop-up menu.
    2. Enter the value of the thickness after =.
  - To define a parametric thickness:
    1. In the **Variables** dialog box, add a new parameter variable for **Length** (for example, P1).
    2. In the **Formula** column, define the default value for the parameter variable.
    3. In the **Sketch Browser**, right-click **Thickness** and select **Add Equation** from the pop-up menu.
    4. Enter the name of the parameter variable (for example, P1) after =.
3. To define the extrusion type:
  - a. In the **Sketch Browser**, right-click **Extrusion Type** and select **Add Equation** from the pop-up menu.
  - b. Enter the extrusion type number (0, 1, or 2) after =.
4. Click the **Save sketch as** button  to save the changes.

See also [Modifying a sketched cross section on page 208](#)  
[Extrusion types on page 211](#)

**Extrusion types**

The extrusion type defines how a sketched profile of a consistent thickness is extruded. When you change the thickness, the profile grows inwards, outwards, or symmetrically in both directions, depending on the extrusion type. You must define the extrusion type for sketches that consist of an open polyline.

The extrusion types are:

Type	Description	Image
0	The sketch is extruded symmetrically to the outside and inside of the polyline. (Default)	 A diagram showing a black L-shaped sketch on a white background. Red dashed lines extend from the outer edges of the L-shape, and red arrows point outwards from the corners, indicating symmetric extrusion.
1	The sketch is extruded to the outside of the polyline.	 A diagram showing a black L-shaped sketch on a white background. Red dashed lines extend from the outer edges of the L-shape, and a red arrow points outwards from the corner, indicating outward extrusion.
2	The sketch is extruded to the inside of the polyline.	 A diagram showing a black L-shaped sketch on a white background. Red dashed lines extend from the inner edges of the L-shape, and a red arrow points inwards towards the corner, indicating inward extrusion.

See also [Setting the sketch thickness on page 210](#)

***Using sketched profiles in a model***

Once you have created a sketched profile and saved it, you are ready to use it in the model. If you have applied constraints correctly, the shape of the profile will be maintained when you change its dimensions.

To use a sketched profile for a new part in a model:

1. Double-click a toolbar button to open the part properties dialog box.

For example, to open the beam properties dialog box, double-click .

2. Click **Select...** next to the **Profile** box.  
The **Select Profile** dialog box appears.
3. Open the **Others** branch at the end of the profile tree.
4. Select a sketched profile.
5. If the profile is parametric, you can define its dimensions in the **Value** column on the **General** tab.
6. Click **OK** to close the **Select Profile** dialog box.
7. Click **Apply** to use the selected profile in the model.
8. Pick points to place the part in the model.

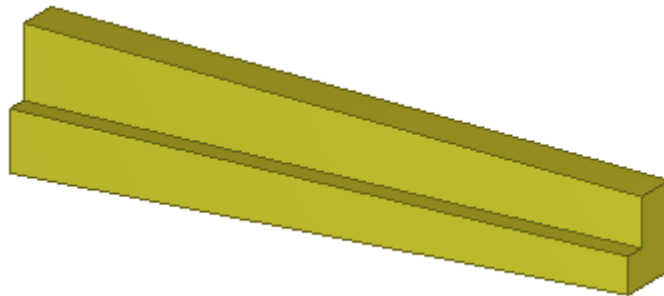
See also [Creating an image of a profile on page 216](#)

## Creating parametric profiles with variable cross sections

You can create parametric user-defined profiles with variable cross sections using the **Profile Editor**. You can use a profile with variable cross sections like any other parametric profile.

You can:

- Use a cross section with different dimensions at different locations in a profile.
- Modify the variables of the cross sections and the profile.
- Save the profile and use it as a parametric profile through the profile catalog.
- Import and export variable cross section profiles.



When you use this method, only the dimensions of a variable cross section can vary, not the actual shape of the cross section. If you want to use several different cross section shapes in the profile, create a fixed profile with multiple cross sections instead.

See also [Creating a profile with variable cross sections on page 213](#)

[Modifying a profile with variable cross sections on page 214](#)

[Creating a fixed profile on page 187](#)

### ***Creating a profile with variable cross sections***

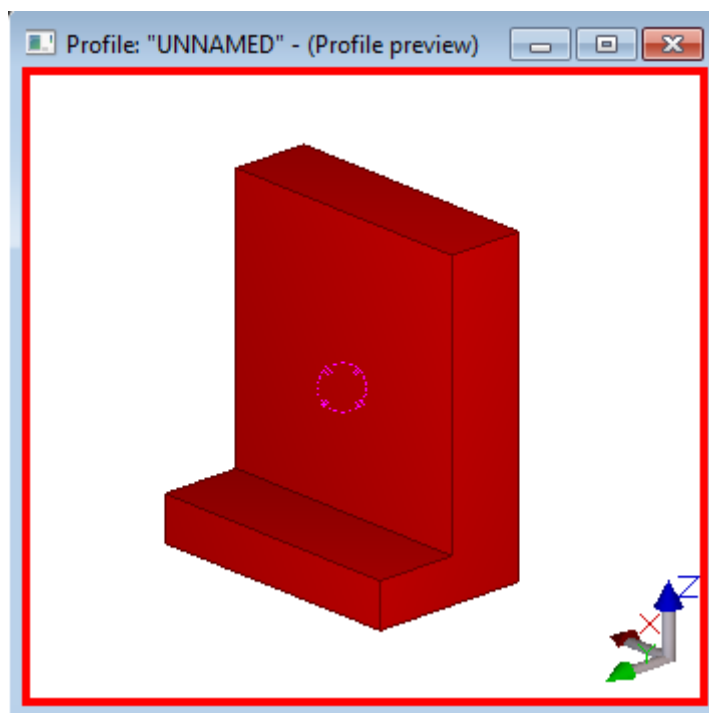
Before you start:

- Create a sketched profile using the sketch editor.
- In the **Variables** dialog box in the sketch editor, set **Visibility** to **Show** for the dimensions that you want to change when using the profile in a model.

To create a profile with a sketched variable cross section:

1. Click **Modeling --> Profiles --> Define Profile with Variable Cross Section...** .  
The **Define Profile with Variable Cross Section** dialog box opens.
2. Select the sketch you want to use as the start and end cross section of the profile.
3. Click **OK**.

The **Profile Editor** and the **Profile preview** view appear.

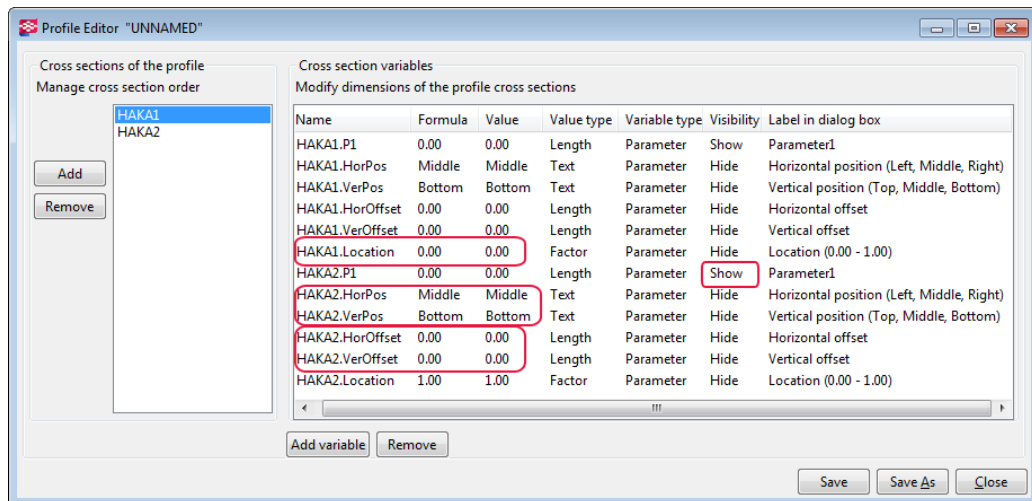


4. Under **Cross sections of the profile**, add cross sections or remove selected cross sections by clicking **Add** or **Remove**.

When you click **Add**, Tekla Structures adds a new cross section at the end of the profile, at the location 1.0., and moves the existing cross sections towards the start of the profile. By default, cross sections are located at 0.1 intervals in the profile.

5. Under **Cross section variables**, define the following:

- The relative location of each cross section in the profile.  
Use the \*.Location variables. For example, start=0.00, middle=0.5, end=1.00.
- How the cross sections are aligned in the horizontal and vertical direction.  
Use the \*.HorPos and \*.VerPos variables.
- How much the cross sections are offset from the alignment.  
Use the \*.HorOffset and \*.VerOffset variables.



- If you have added new cross sections, check that they do not overlap any existing cross sections.
- Set **Visibility** to **Show** for the dimensions that you want to change when using the profile in a model.
- If you want to use parameter variables and equations to define the cross section dimension, click **Add variable** and define the variable values.
- Save the profile.
  - Click **Save**.
  - In the **Save profile as** dialog box, enter a unique name for the profile.  
You cannot include numbers in the profile name, or use the name of a standard profile.
  - Click **OK**.  
Tekla Structures saves the profile in the current model folder.

**See also** [Creating parametric profiles with variable cross sections on page 212](#)


[Modifying a profile with variable cross sections on page 214](#)

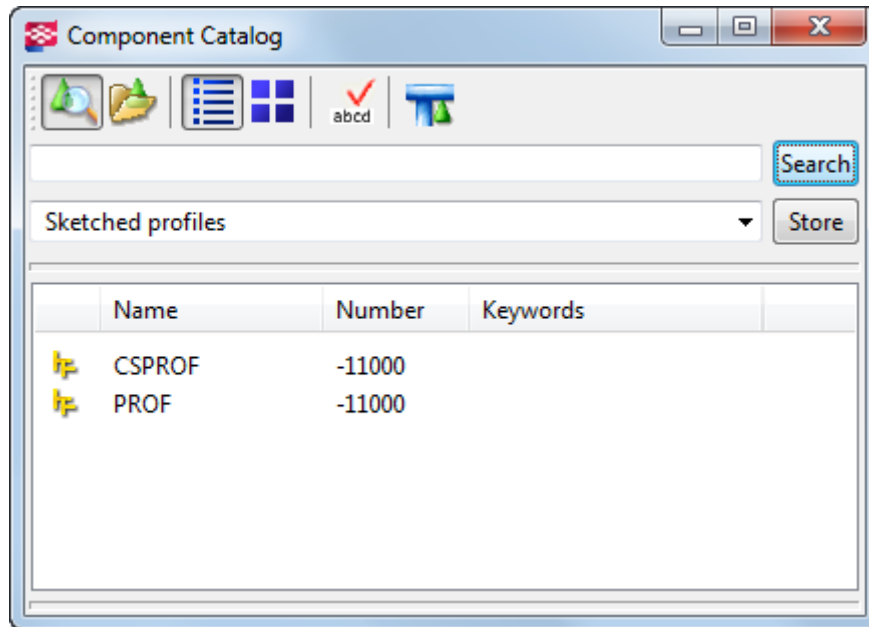
[Creating parametric profiles by sketching on page 191](#)

### ***Modifying a profile with variable cross sections***

To modify a profile that consists of variable cross sections:

1. Press **Ctrl + F** to open the **Component Catalog**.

Existing profiles are listed in the **Sketched profiles** folder. Profiles with variable cross sections have the symbol  next to their name.



2. Double-click a profile with variable cross sections to open it in the **Profile Editor**.
3. Modify the profile properties.
4. Click **Save**.

See also [Creating a profile with variable cross sections on page 213](#)

## **8.5 Defining standardized values for parametric profiles**

You can define standardized values for the dimensions of parametric profiles. The standardized values are visible in the profile catalog where you can select suitable dimension values for the profiles.

To define standardized values:

1. Go to the `..\ProgramData\Tekla Structures\<version>\environments\<environment>\system` folder.
2. Open the `industry_standard_profiles.inp` file using any standard text editor, for example, Microsoft Notepad.

3. Modify the file.

The file has the following format:

- profile and profile subtype
- parameters separated by spaces
- units for each parameter
- standardized values for each parameter.

Each dimension combination has its own row.

4. Save the file.

**Example** For example, the standardized combinations of dimension values for a C profile are as follows:

c	h*b*t	
h	b	t
mm	mm	mm
75	35	5
75	35	6
75	35	7
100	40	7
100	40	8
100	40	9

See also

## 8.6 Creating an image of a profile

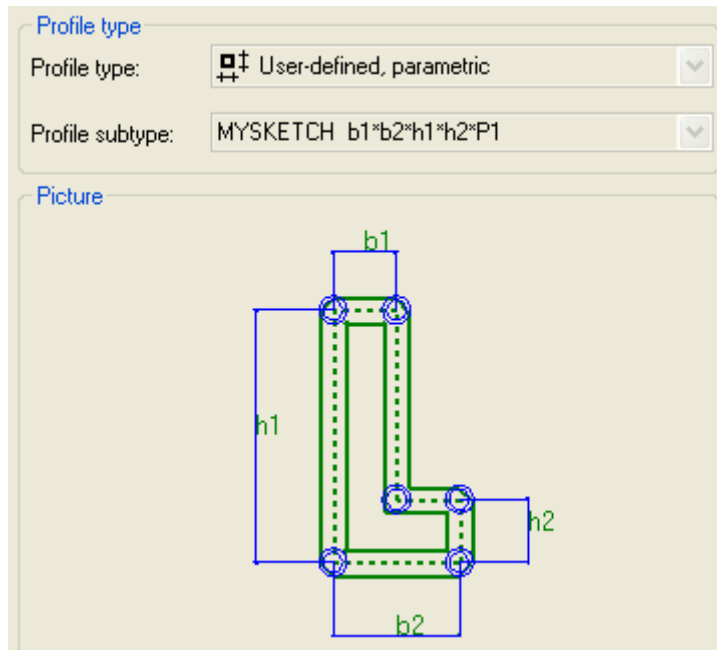
To illustrate the shape and dimensions of a profile you have created, you can create an image of it. Tekla Structures displays the image when you browse for profiles in the profile catalog. The image must be in Windows bitmap (.bmp) format and can be created with any bitmap editor, for example Microsoft Paint.

To create an image of a profile:

1. Take a screenshot of the profile you have drawn or sketched.  
For example, press the **Print Screen (Prt Scr)** key to take a screenshot of your entire desktop. To take a screenshot of an active window, press **Alt+Print Screen**. The screenshot is placed on the clipboard.
2. Open the screenshot in any bitmap editor (for example, Microsoft Paint) and modify the image if necessary.
3. Save the image in .bmp format in the ..\ProgramData\Tekla Structures \<version>\Bitmaps folder.  
The file name must match the actual profile name. For example, if the profile name is mysketch, the image must be named mysketch.bmp.
4. Restart Tekla Structures.



The image is now shown in the profile catalog.



See also

## 8.7 Predefined parametric profiles available in Tekla Structures

The following predefined parametric profiles are available in Tekla Structures.

[I profiles on page 218](#)

[I beams \(steel\) on page 218](#)

[L profiles on page 219](#)

[Z profiles on page 220](#)

[U profiles on page 220](#)

[C profiles on page 221](#)

[T profiles on page 222](#)

[Welded box profiles on page 222](#)

[Box profiles on page 224](#)

[WQ profiles on page 225](#)

[Rectangular sections on page 225](#)

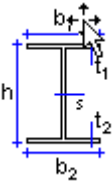
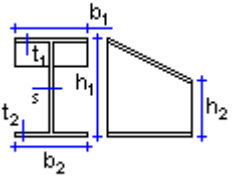
[Circular sections on page 226](#)

[Rectangular hollow sections on page 226](#)

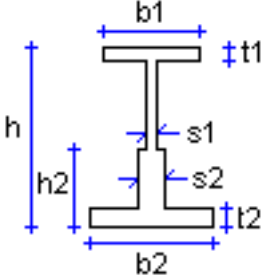
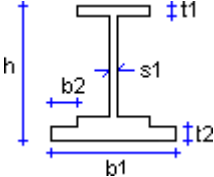
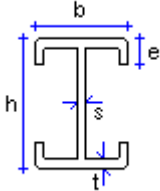
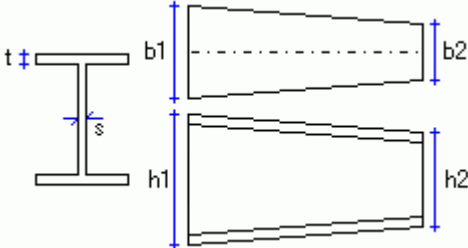
[Circular hollow sections on page 226](#)

[Cold rolled profiles on page 227](#)  
[Folded plates on page 230](#)  
[Hat profiles on page 236](#)  
[I beams \(concrete\) on page 237](#)  
[Ledger beams \(concrete\) on page 237](#)  
[T profiles \(concrete\) on page 238](#)  
[Irregular beams \(concrete\) on page 240](#)  
[Panels on page 244](#)  
[Variable cross sections on page 246](#)  
[Others on page 248](#)

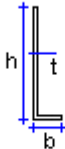
## I profiles

	$Hlh-s-t*b$ (symmetric) $Hlh-s-t1*b1-t2*b2$
	$Hlh1-h2-s-t*b$ $Hlh1-h2-s-t1*b1-t2*b2$

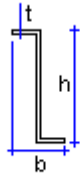
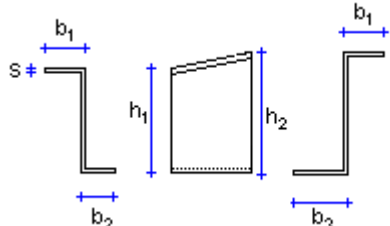
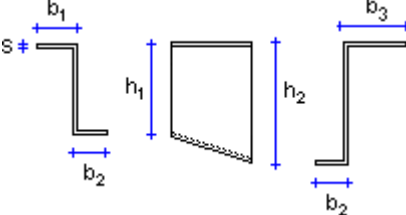
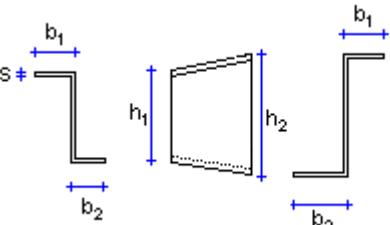
I beams (steel)

	$I\_BLT\_Ah-b1-s1-t1*h2-b2-s2-t2$
	$I\_BLT\_B\ h*b1*t1*s-b2*t2$
	$I\_HEMh*b*c*s*t$
	$I\_VAR\_Ah1-ht*b1-bt*s*t$

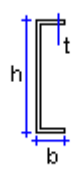
L profiles

	$Lh*b*t$
---	----------

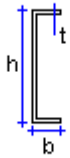
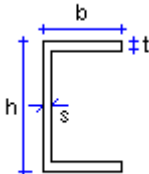
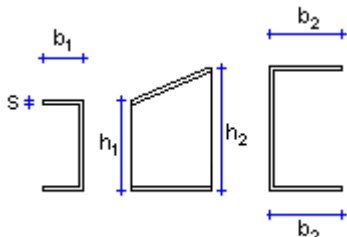
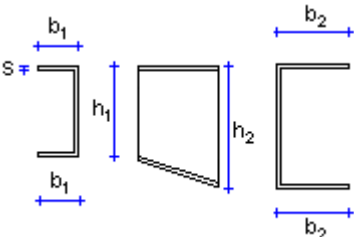
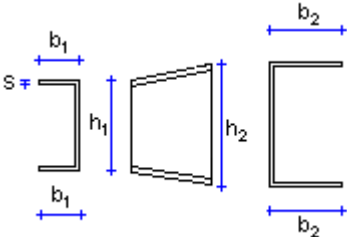
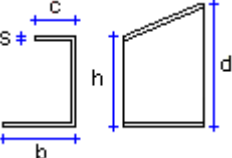
## Z profiles

	$Zh*b*t$
	$Z\_VAR\_Ah1*b1*b2-s-h2*b3$
	$Z\_VAR\_Bh1*b1*b2-s-h2*b3$
	$Z\_VAR\_C h1*b1*b2-s-h2*b3$

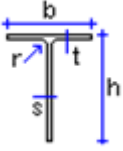
## U profiles

	$Uh*b*t$
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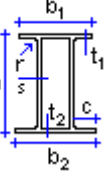
## C profiles

	$Ch*b*t$
	$C\_BUILT h*b*s*t$
	$C\_VAR\_Ah1*b1-s-h2*b2$
	$C\_VAR\_Bh1*b1-s-h2*b2$
	$C\_VAR\_Ch1*b1-s-h2*b2$
	$C\_VAR\_Dh-b-d-c-s$

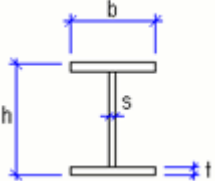
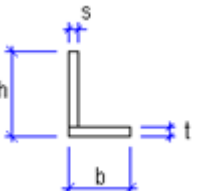
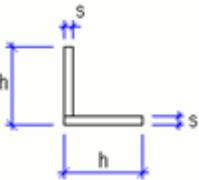
## T profiles

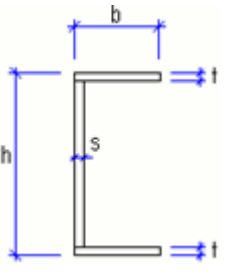
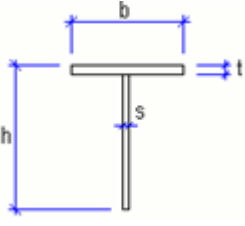
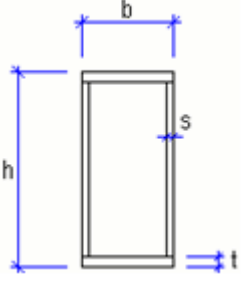
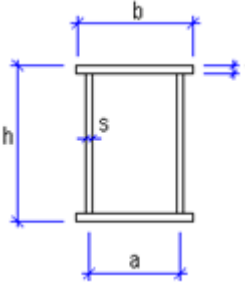
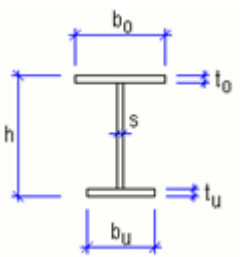
	Th-s-t-b
---	----------

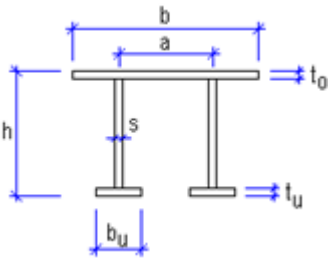
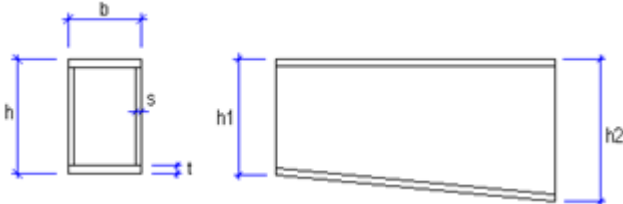

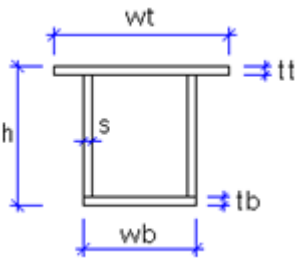
## Welded box profiles

	HK h-s-t*b-c HKh-s-t1*b1-t2*b2-c
---	-------------------------------------

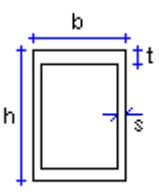
## Welded beam profiles

	B_WLD_A h*b*s*t
	B_WLD_B h*b*s*t
	B_WLD_C h*s

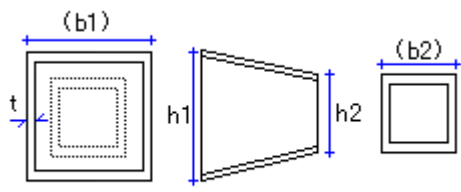
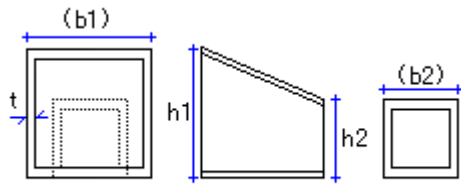
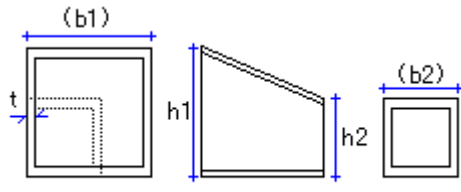
	B_WLD_D $h*b*s*t$
	B_WLD_E $h*b*s*t$
	B_WLD_F $h*b*s*[t]$
	B_WLD_G $h*b*s*t*a$
	B_WLD_H $h*bo*bu*s*to*tu$

	$B\_WLD\_I \ h \cdot b_o \cdot s \cdot t_o \cdot b_u \cdot t_u \cdot a$
	$B\_WLD\_J \ h_1/h_2 \cdot b \cdot s \cdot t$
	$B\_WLD\_K \ h_1/h_2 \cdot b \cdot s \cdot t$
	$B\_WLD\_L \ h \cdot wt \cdot wb \cdot s \cdot tt \cdot tb$

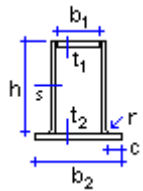
## Box profiles

	$B\_BUILTh \cdot b \cdot s \cdot t$
---	-------------------------------------

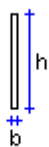


	B_VAR_Ah1-h2*t
	B_VAR_Bh1-h2*t
	B_VAR_Ch1-h2*t

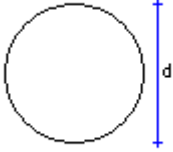
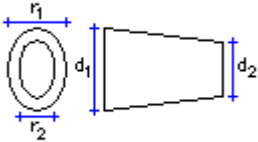
## WQ profiles

	$HQh-s-t_1*t_2*b_2$ $HQh*s-t_1*b_1-t_2*b_2-c$
---	--

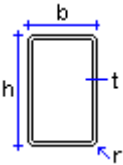
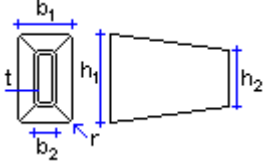
## Rectangular sections

	$PLh*b$ h=height b=thickness (smaller=b)
---	---

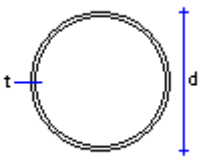
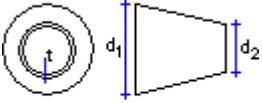
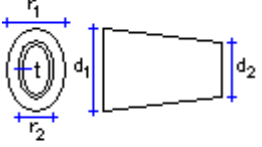
### Circular sections

	$Dd$
	$ELDd1*r1*d2*r2$

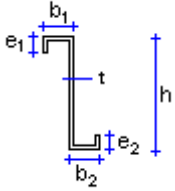
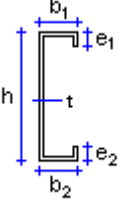
### Rectangular hollow sections

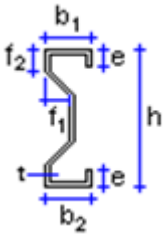
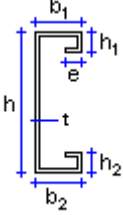
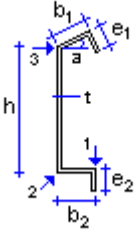
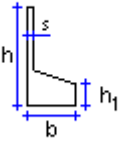
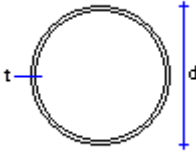
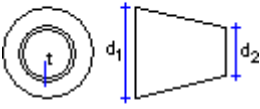
	$Ph*t$ (symmetric) $Ph*b*t$
	$Ph1*b1-h2*b2*t$

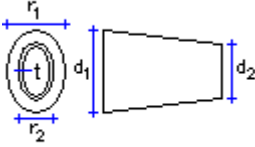
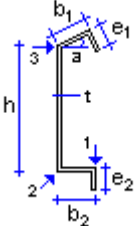
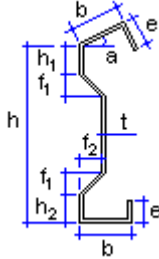
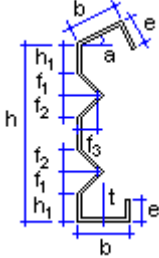
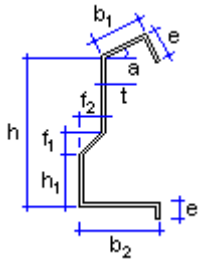
## Circular hollow sections

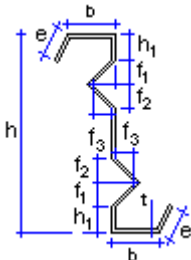
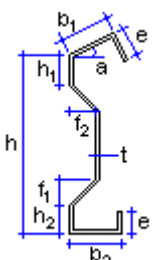
	$PDd$
	$PDd1*d2*t$
	$EPDd1*r1*d2*r2*t$

## Cold rolled profiles

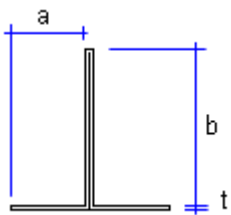
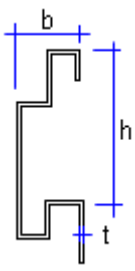
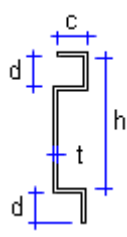
	$ZZh-t-e-b$ (symmetric) $ZZh-t-e1-b1-e2-b2$
	$CCh-t-e-b$ (symmetric) $CCh-t-e1-b1-e2-b2$

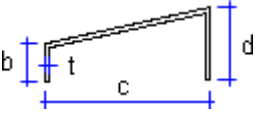
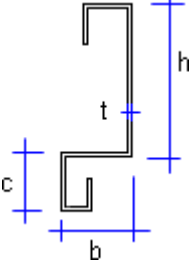
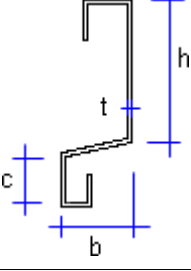
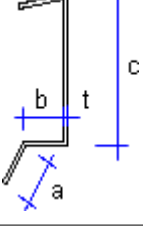
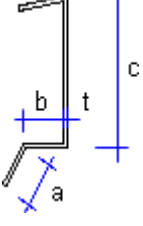
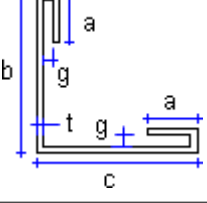
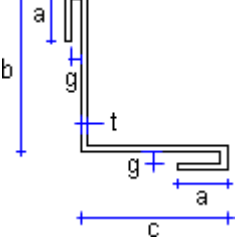
	<p>CW h-t-e-b-f-h1 (symmetric)</p> <p>CW h-t-e1*b1-f1-f2-e2*b2</p>
	<p>CUh-t-h1-b-e (symmetric)</p> <p>CUh-t-h1-b1-h2-b2-e</p>
	<p>EBh-t-e-b-a</p> <p>EBh-t-e1-b1-e2-b2-a</p> <p>Reference points: 1=right 2=left 3=top</p>
	<p>BFh-s-b-h1</p>
	<p>SPDd*t</p>
	<p>SPDd2*d2*t</p>

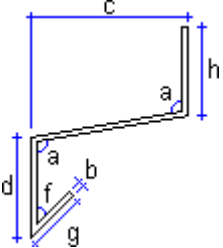
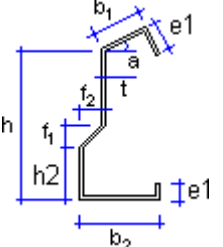
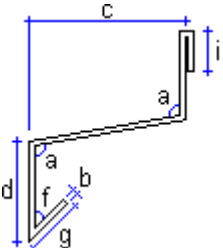
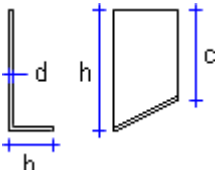
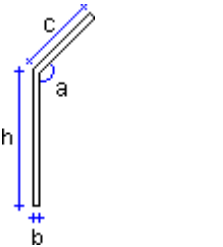
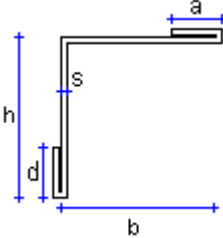
	ESPD d1-d2*t
	ECh-t-e-b-a ECh-t-e1-b1-e2-b2-a
	EDh-t-b-e-h1-h2-f1-f2-a
	EEh-t-e-b-f1-f3-h1-f2-a
	EFh-t-e-b1-b2-f1-f2/h1-a

	EZh-t-e-b-f1-f3-h1-f2-a
	EWh-t-e-b1-b2-f1-f2-h2-h1-a

## Folded plates

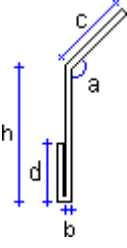
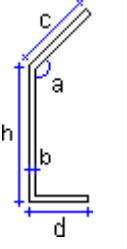
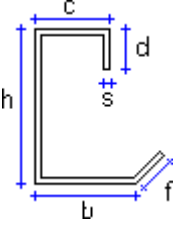
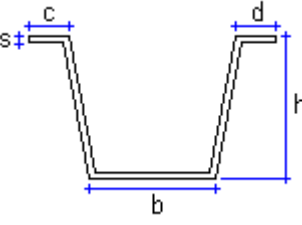
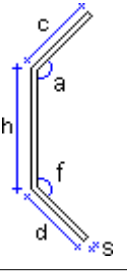
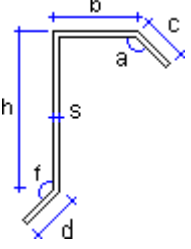

	FFLAa-b-t
	FPANBh-b-t FPANB_-b-t FPANBAh-b-t FPANBA_h-b-t
	FPANBBh-c-d-t

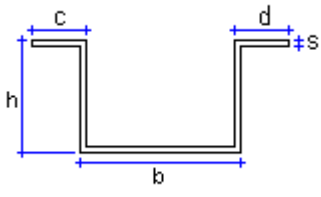
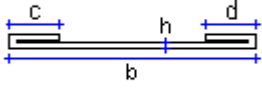
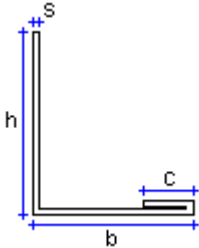
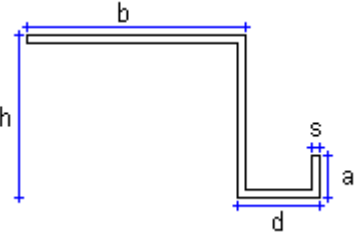
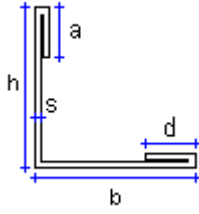
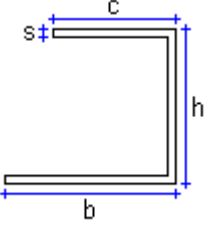
	FPANCVb-c-d-t
	FPANGh-b-c-t
	FPANGAh-b-c-t
	FPANJa-b-c-t
	FPANJa-b-c-t
	FPAN a-b-c-t-g
	FPANVWa-b-c-t-g

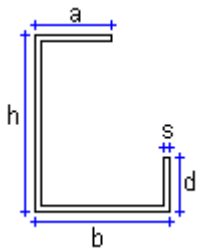
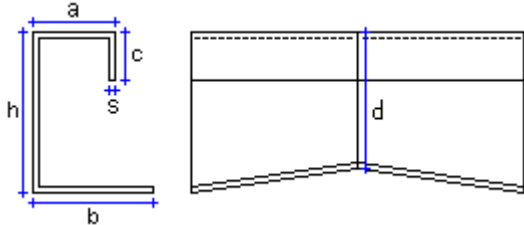
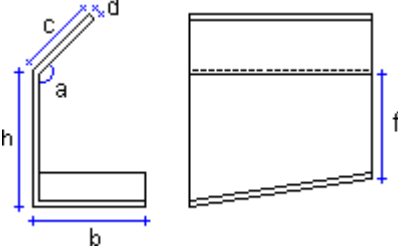

	FP_Ah-b-c-d-g
	FP_AAh*b2*t*a
	FP_Bh-b-c-d-g-i
	FP_BBh-b-d
	FP_Cb-h-c
	FP_CCh-b-a-d-s



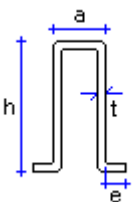

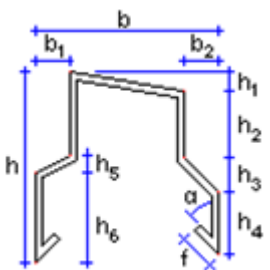
	FP_Db-h-c-d-f-g-i-j-s
	FP_Eb-h-c-d-f-g-s
	FP_Fb-h-c-d-f-g-s
	FP_Gb-h-c-d-f-g-s
	FP_Hb-h-c-d-f-s
	FP_Ib-h-c-d-f-s

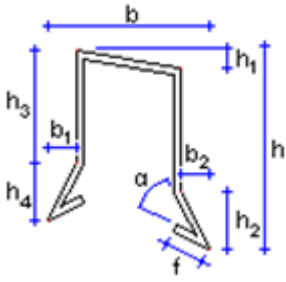
	FP_Jb-h-c-d-a
	FP_Kb-h-c-d
	FP_Lb-h-c-d-f-s
	FP_Mb-h-c-d-s
	FP_Nb-h-c-d
	FP_Ob-h-c-d-s
	FP_Pa1*a2*h-b1*b2-Alpha1-Alpha2-Beta1-Beta2-s

	FP_Qb-h-c-d-s
	FP_Rb-h-c-d
	FP_Sb-h-c-s
	FP_Tb-h-a-d-s
	FP_Ub-h-a-d-s
	FP_Vb-h-s-c

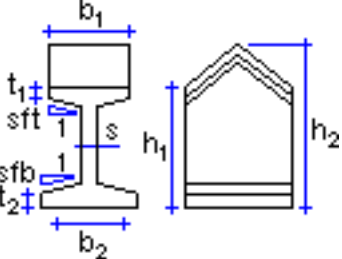
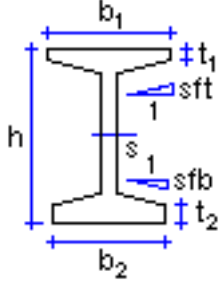
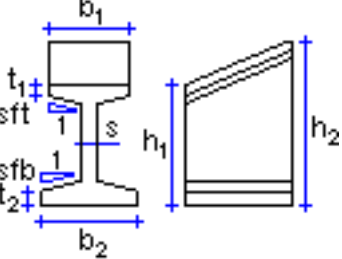
	FP_Wb-h-a-d-s
	FP_WWh-b-a-c-s
	FP_Yh-b-c-d
	FP_Zd-h-b-s-a-f

## Hat profiles

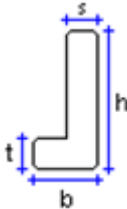
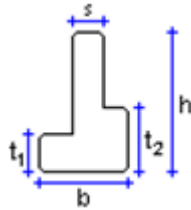
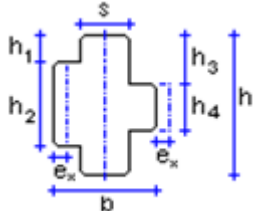
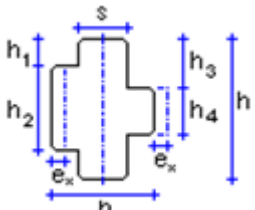
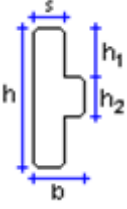
	HAT $h \cdot a \cdot c \cdot t$
	HATCa-b-c-b1-h-b3-b4-b5-s
	HATAB1* $h_1 \cdot h_2 \cdot h_3 \cdot h_4 \cdot h_5 \cdot h_6 \cdot b_2 \cdot t \cdot f \cdot a \cdot h \cdot b$

	$HATBb*b1*b2*h*h1*h2*h3*h4*t*f*a$
---	-----------------------------------

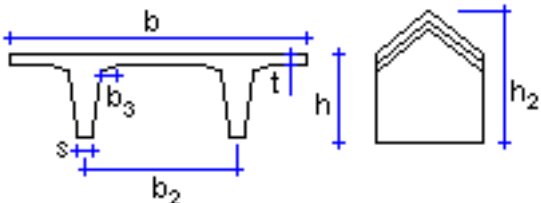
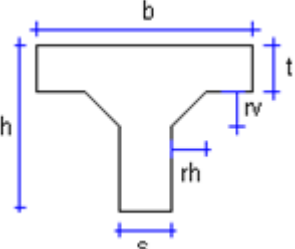
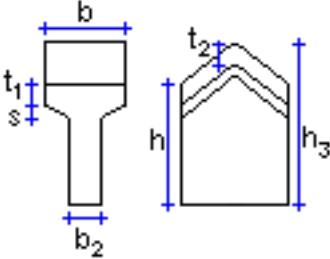
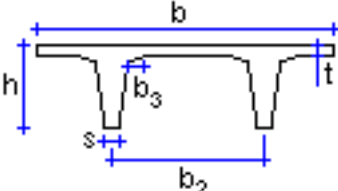
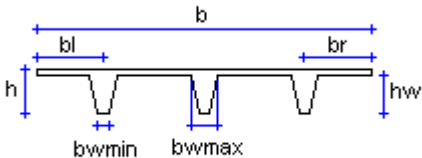
## I beams (concrete)

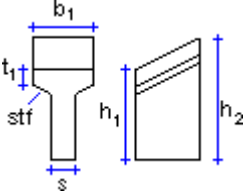
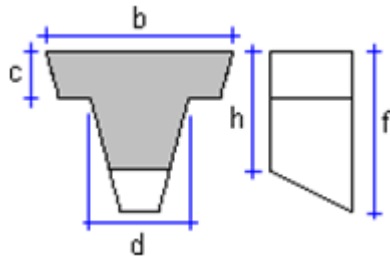
	$HIh1*b1*t1-h2-s-b2*t2[-sft[-sfb]]$
	$IIh*b1*t1-s-b2*t2[-sft[-sfb]]$
	$SIIh1*b1*t1-h2-s-b2*t2[-sft[-sfb]]$

## Ledger beams (concrete)

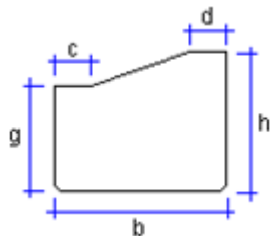
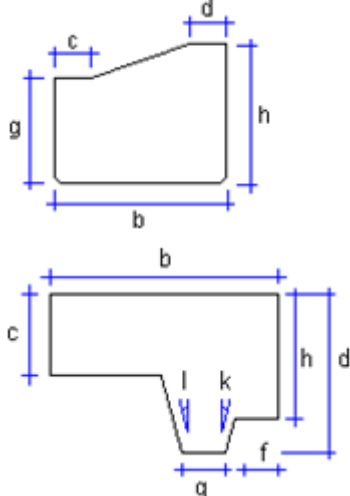
	$RCLs \cdot h - b \cdot t$
	$RCDLs \cdot h - b \cdot t$ $RCDLs \cdot h - b \cdot t_1 \cdot t_2$
	$RCDXs \cdot h - b \cdot h_2 \cdot h_1$ $RCDXs \cdot h - b \cdot h_4 \cdot h_3 \cdot h_2 \cdot h_1$ $RCDXs \cdot h - b \cdot h_4 \cdot h_3 \cdot h_2 \cdot h_1 - ex$
	$RCXXs \cdot h - b \cdot t \cdot h_1 - h_2 - ex$
	$RCXs \cdot h - b \cdot h_2 \cdot h_1$

## T profiles (concrete)

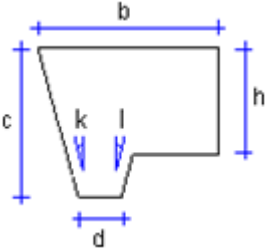
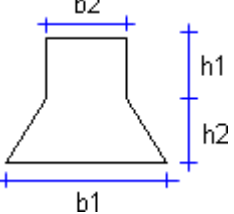

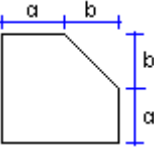
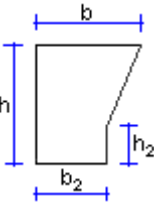
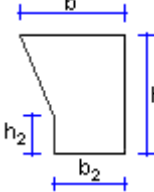
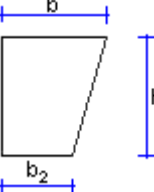
	HTTh*b-s-t-b2-h2
	TCh-b-t-s
	TRIh*b-b2*t1-h3-t2
	TTh*b-s-t-b2
	TTTh*b-bl-br-hw-bwmin-bwmax

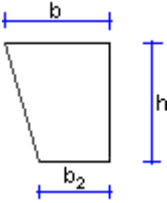
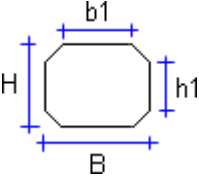
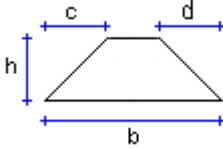
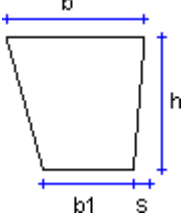
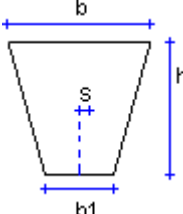
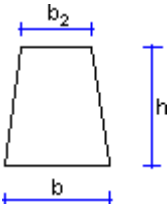
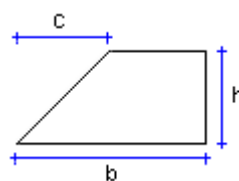
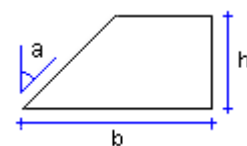
	T_VAR_Ah1*h2*s*b1*t1-sft
	T_VAR_Bh-b-c-d

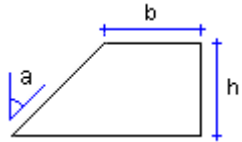
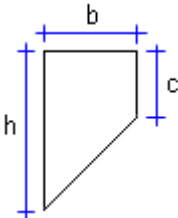
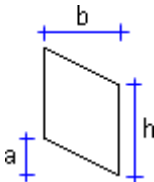
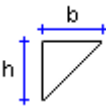
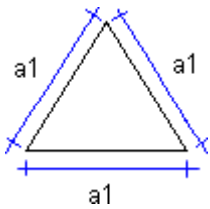
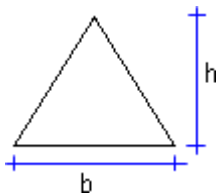
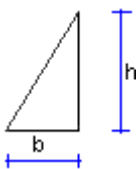
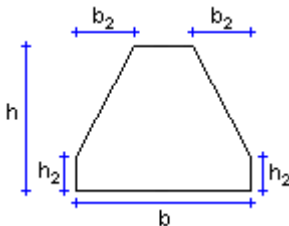
### Irregular beams (concrete)

	IRR_Ab-h-g-c-d
	IRR_Bh-b-c-d-f-g


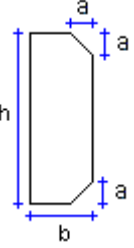
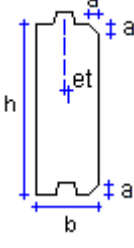
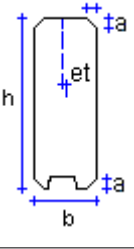
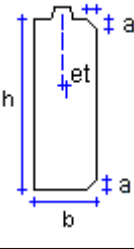


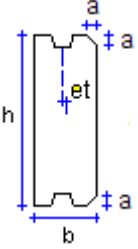
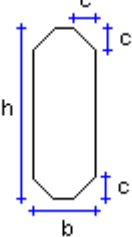
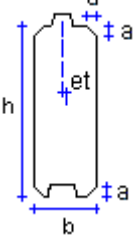
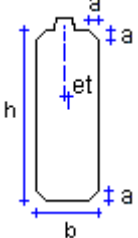
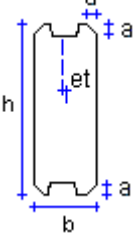
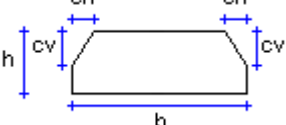
	IRR_Ch-b-c-d
	IRR_Db1*b2-h1*h2
	IRR_Eh-b-c-d-h2-h3-h4
	IRR_Fa*b
	IRR_Gh*b*h2*b2
	IRR_Hh*b*h2*b2
	IRR_Ih*b*b2

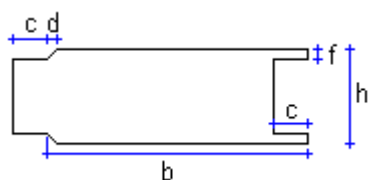
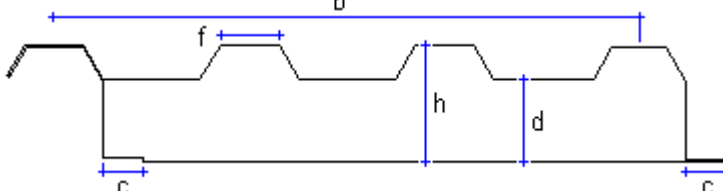
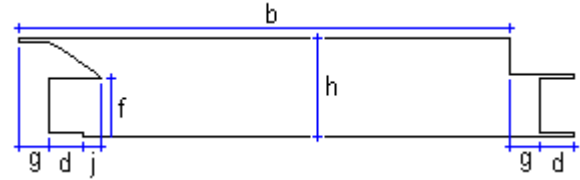
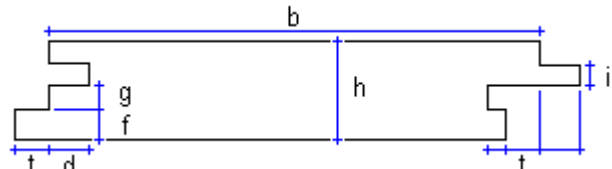
	IRR_Jh*b*b2
	OCTB*b1-H*h1
	REC_Ah-b
	REC_Bh-b-b1
	REC_Ch-b-b1
	REC_Dh-b-b2
	REC_Eh-b
	REC_Fh-b

	REC_Gh-b
	REC_Hh-b
	REC_I a-b*h
	TRI_Ah-b
	TRI_Ba1
	TRI_Cb-h
	TRI_Dh*b
	TRI_Eb*h*h2*b2

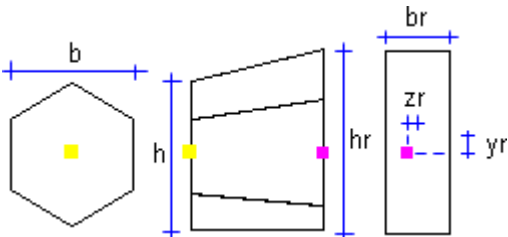
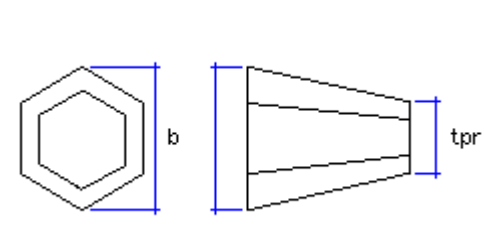
## Panels

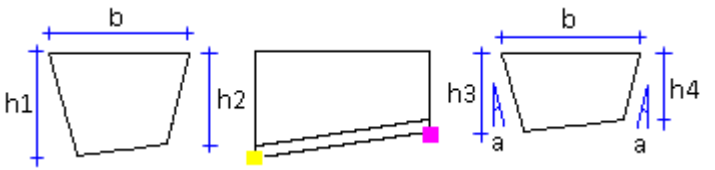
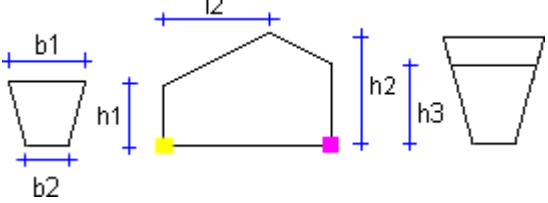
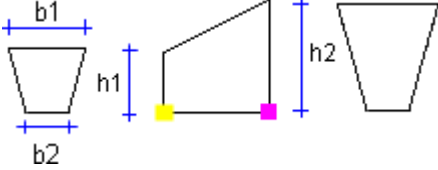
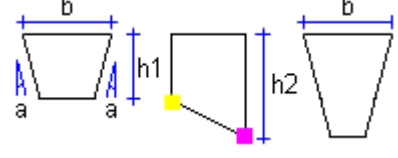
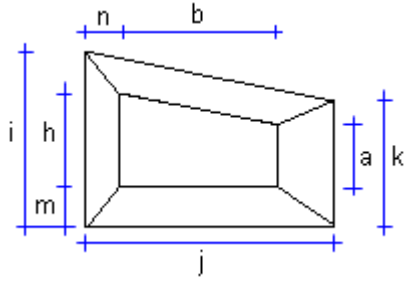
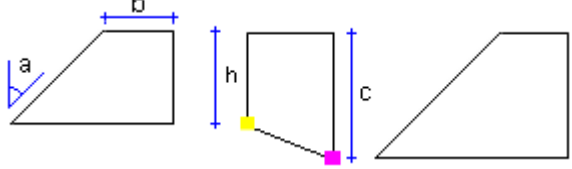
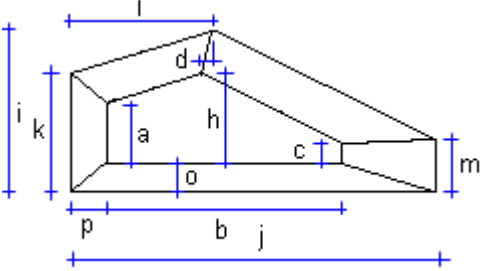
	PNL_Ah*b
	PNL_Bh*b
	PNL_Ch*b-a-ht*bt
	PNL_Dh*b-a-ht*bt
	PNL_Eh*b-a-ht*bt

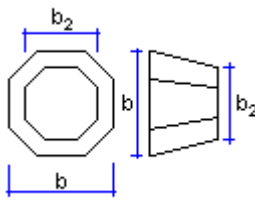
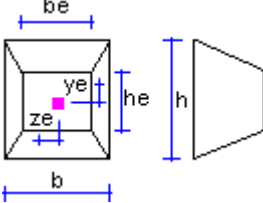
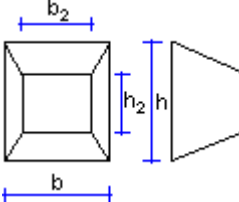
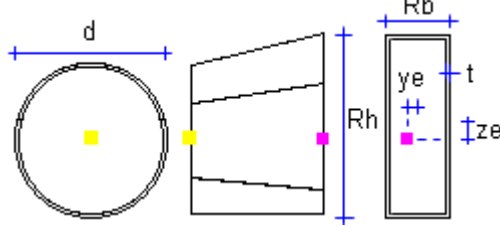
	PNL_Fh*b-a-ht*bt
	PNL_Gh*b
	PNL_Hh*b-a-ht
	PNL_Ih*b-a-ht*bt
	PNL_Jh*b-a-ht*bt
	PNL_Kh*b

	PNL_Lh-b-c-f
	PNL_Mh-b-c-f-d
	PNL_Nh-b-d-f-g-j
	PNL_Oh-b-d-f-g-i-t

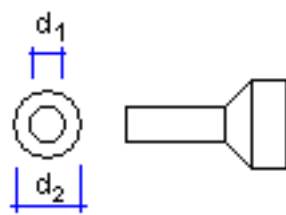
## Variable cross sections

	HEXRECTh-b-br-hr
	HXGONb

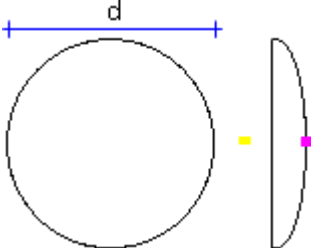
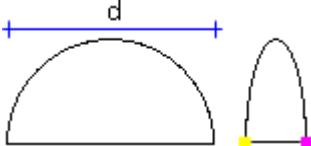
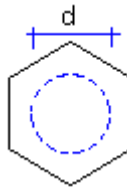
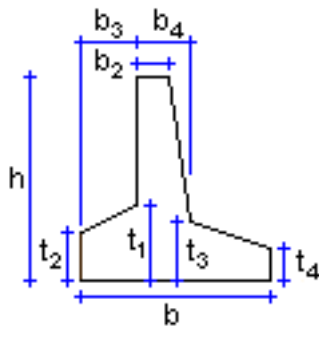
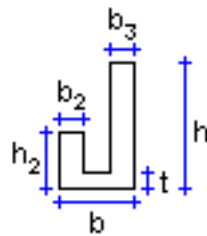
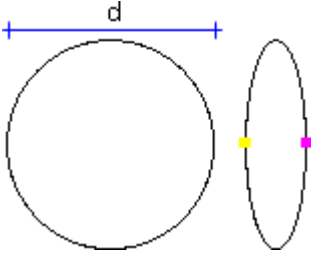
	OBLINCLh1-h2-h3-h4-b
	OBLRIDh1*b1*b2-h2-h3-l2-l1
	OBLVAR_Ah1*b1*b2-h2
	OBLVAR_Bh1-h2-b
	OBLVAR_Ch-b-a-i-j-k-m-n
	OBLVAR_Dh-c-b
	OBLVAR_Eh-b-a-c-d-i-j-k-l-m-p-o

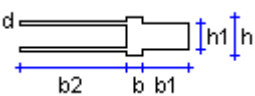
	OCTAGONb-b2
	PRMDASH*b-he*be PL_Vh*b-he*be
	PRMDh*b-h2*b2
	ROUNDRECTd-Rb*Rh-t*ye-ze

## Others

	BLKSd1-d2
---	-----------



	CAPd
	HEMISPHERd
	NUT_Md
	$RCRWh*b-b2*b3-b4-t1*t2-t3*t4$
	$SKh*b-h2-t-b2-b3$
	SPHEREd

	STBb-h-h1-b1-b2-d
	STEPb-b*h1-b1-s

## 8.8 Shapes

The **Shape Catalog** dialog box contains information on shapes. It is used for viewing shape properties, and for importing and exporting shapes.

The shapes you download from Tekla Warehouse are also displayed in the **Shape Catalog** dialog box.

The catalog includes two default shapes: **Default** and **Concrete\_Default**. Shapes are used in defining items. In Tekla Structures, items are similar to other parts, such as beams and columns. The main difference between items and other types of parts is that a 3D shape defines the geometry of an item, whereas a part has a 2D profile that is extruded to create the length of the part.

The shapes you import to the shape catalog are stored in the current model folder. There are two .xml files for each shape: one stored in the \Shapes folder and one in the \ShapeGeometries folder.

If you have shapes that you would like to have available in the **Shape Catalog** dialog box for all new models that are created in your project or company, copy the corresponding .xml files to the correct subfolders (\Shapes and \ShapeGeometries) in the \profil folder under your project or firm folder.

See also [Importing a shape on page 250](#)

[Exporting a shape on page 251](#)

[Deleting a shape on page 252](#)

## Importing a shape

You can import the following types of shape files: `dgn`, `tsc`, `skp`, `dxf`, `dwg`, `ifc`, `ifcZIP`, `ifcXML`, `igs`, `iges`, `stp`, and `step`.

When using other modeling software to model shapes that you want to import into Tekla Structures, we recommend that you center parts around the origin and direct the parts along the x axis.

To import a shape:

1. Click **Modeling** --> **Shape Catalog**.

The **Shape Catalog** dialog box opens.

2. Click **Import**.
3. Select the import file.
4. Click **OK**.

Importing a large file can take several minutes.

Shape import has three possible results:

- Tekla Structures imports the shape as a watertight solid shape. All solid operations are available.
- Tekla Structures imports the shape as a non-solid shape. A non-solid shape means that the object may not be watertight. For example, it has holes, or is missing a face or an edge.
- Import fails. This can happen, for example, if the shape is very complex or has no volume. There may also be a tolerance difference between Tekla Structures and the original software that was used to create the shape. To find out why the import failed, check the session history log by clicking **Tools** --> **Display Log File** --> **Session History**.

When you import a shape into the **Shape Catalog**, Tekla Structures creates two `.xml` files: one for shape attributes, such as name and GUID, and one for geometric properties, such as coordinates. The files are saved in the current model folder under the `\Shapes` and `\ShapeGeometries` subfolders.



You can also download shapes from Tekla Warehouse.

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**See also** [Example: Importing a shape from SketchUp Pro on page 253](#)

[Exporting a shape on page 251](#)

[Deleting a shape on page 252](#)

[Shapes on page 250](#)

## Exporting a shape

To export a shape:

1. Click **Modeling** --> **Shape Catalog** .  
The **Shape Catalog** dialog box opens.
2. Select the export file.
3. Click **Export**.
4. Select the folder where you want to export the shape.
5. Click **OK**.

The shape is saved in the destination folder as a `.tsc` file.



You can also upload shapes to Tekla Warehouse.

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**See also** [Importing a shape on page 250](#)  
[Deleting a shape on page 252](#)  
[Shapes on page 250](#)

## Deleting a shape

Before you start, ensure that the shape you want to delete is not used in your Tekla Structures model. When you delete a shape from the **Shape Catalog**, the shape is no longer available anywhere in the model. If a model includes a deleted shape, it is only shown as a straight line between its original reference points.

To delete a shape:

1. Click **Modeling** --> **Shape Catalog** .  
The **Shape Catalog** dialog box opens.
2. Right-click the name of the shape.
3. Click **Delete**.

Tekla Structures deletes the shape.

**See also** [Importing a shape on page 250](#)  
[Exporting a shape on page 251](#)  
[Shapes on page 250](#)

## Example: Importing a shape from SketchUp Pro

In this example, you import a solid 3D shape from Trimble SketchUp Pro to a Tekla Structures model.

To import a shape from SketchUp Pro:

1. Create an empty model in SketchUp Pro.

Delete any extra entities, such as the default person on the drawing area.

2. Create a group of entities.

Although Tekla Structures supports importing separate individual entities, we recommend you create a group of entities or a component in SketchUp.

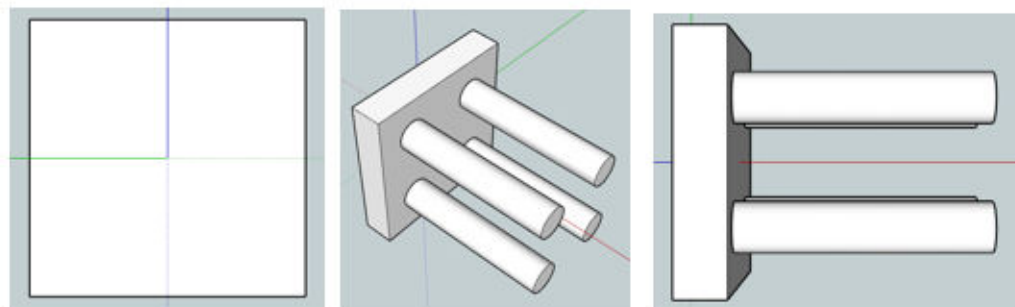
All SketchUp groups and components should form watertight solids. Select the group or component and open **Entity Info** to check that the selection is a solid. SketchUp solids have a volume. If there is no volume listed, the selection is not a solid.

3. Select the group and click **Solid Tools** --> **Union** to make the group of entities into a union of solids.

Your group becomes a single solid volume: a solid.

4. Place the solid in SketchUp so that it lies along the positive x axis (red), and halfway on both y (green) and z axes (blue). In Tekla Structures, the yellow and magenta part handles will align with the x axis used in SketchUp.

The location and rotation of the solid in SketchUp are important, since they determine how an item is inserted and positioned in Tekla Structures. Different positioning in SketchUp causes an offset in Tekla Structures.



5. Save the SketchUp file.
6. In your Tekla Structures model, open the **Shape Catalog** and click **Import**.
7. Select the SketchUp file.
8. Click **OK**.

Tekla Structures imports the shape to the **Shape Catalog** and you can use it to define the shape of an item or a concrete item.

See also [Shapes on page 250](#)

About items

Changing the shape of an item

[Importing a shape on page 250](#)

# 9 Material grades

The material catalog contains information on material grades. Materials are displayed in a hierarchical tree grouped according to material types, for example, steel and concrete. Material grades are located under each material type in the tree.

By default, the material catalog contains standard, environment-specific materials. You can add, modify, and delete material grades.

Tekla Structures stores the material information in the `matdb.bin` file.

**See also** [Material types on page 255](#)

[Managing material grades on page 255](#)

[Importing and exporting material grades on page 259](#)

[Creating user-defined material definitions on page 262](#)

## 9.1 Material types

You cannot add new material types to the material catalog. The following material types are available:

- Steel
- Concrete
- Reinforcing bar
- Reinforcement mesh
- Timber
- Miscellaneous

**See also** [Material grades on page 255](#)

## 9.2 Managing material grades


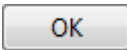
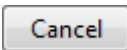
You can manage existing material grades using the material catalog. For example, you can add, modify and delete material grades.

Click the links below to find out more:

- [Important buttons in the material catalog on page 256](#)
- [Adding a material grade on page 256](#)
- [Modifying a material grade on page 257](#)
- [Copying a material grade on page 257](#)
- [Deleting a material grade on page 258](#)
- [Adding user attributes to material grades on page 259](#)

### Important buttons in the material catalog

When you work with the material grades, note the usage of the following buttons in the **Modify Material Catalog** dialog box:

Button	Description
	Saves the changes of a single edited material grade to the computer's memory until you click <b>OK</b> .
	Saves the changes in the model folder. Tekla Structures saves the modified catalog on the hard disk when you click <b>OK</b> to close the dialog box and then click <b>OK</b> in the <b>Save confirmation</b> dialog box.
	Closes the <b>Modify Material Catalog</b> dialog box without saving the changes. Note that all changes made to the catalog will be lost even if you have clicked <b>Update</b> , because the changes have not been saved on the hard disk. The changes made to the catalog are visible during one session, because the catalog is using the computer's memory. When you start Tekla Structures the next time, the previous data is restored from the hard disk.

Tekla Structures stores the material information in the `matdb.bin` file. When you first open a model, Tekla Structures reads the data from the hard disk and stores it in the computer's memory.

When you select a material, Tekla Structures reads the data from the computer's memory and displays it in the **Modify Material Catalog** dialog box. This is faster than accessing the data from the hard disk.

See also [Managing material grades on page 255](#)



## Adding a material grade

To add a new material grade:

1. Click **Modeling** --> **Material Catalog...** to open the **Modify Material Catalog** dialog box.
2. Select a material type, for example, steel.
3. Right-click and select **Add Grade**.  
A new material grade is added under to the material type you selected.
4. Change the material grade name by clicking the grade and entering a new name for it.
5. Enter the material grade properties.
6. Click **OK** to save the material grade and close the **Modify Material Catalog** dialog box.
7. Click **OK** in the **Save confirmation** dialog box to save the changes.

**See also** [Copying a material grade on page 257](#)  
[Modifying a material grade on page 257](#)  
[Deleting a material grade on page 258](#)

## Copying a material grade

You can add new material grades by modifying a copy of an existing, similar material grade.

To copy a material grade:

1. Click **Modeling** --> **Material Catalog...** to open the **Modify Material Catalog** dialog box.
2. Select a material grade that is similar to the one you wish to create.
3. Right-click and select **Copy Grade**.  
A copy of the material grade with the name **COPY** is added to the material tree.
4. Change the material grade name by clicking the grade and entering a new name for it.
5. Modify the material grade properties.
6. Click **OK** to save the material grade and close the **Modify Material Catalog** dialog box.
7. Click **OK** in the **Save confirmation** dialog box to save the changes.

**See also** [Adding a material grade on page 256](#)  
[Modifying a material grade on page 257](#)  
[Deleting a material grade on page 258](#)

## Modifying a material grade

You can modify existing material grades using the material catalog.

To modify an existing material grade:

1. Click **Modeling** --> **Material Catalog...** to open the **Modify Material Catalog** dialog box.
2. Select a material grade in the tree and modify its properties.
  - Use the **General** tab for entering three alternative names for the material. The names are usually the material names used in different countries or standards. The tab also contains the profile and plate density values.
  - Use the **Analysis** tab for entering information on the properties used in structural analysis.
  - Use the **Design** tab for entering information on the design-specific properties, such as strengths and partial safety factors.
  - Use the **User attributes** tab for creating your own attributes for material grades.  
For example, you can define a paint layer thickness, or the maximum grain size of concrete using a user-defined attribute.
3. When you have finished modifying the material grade, click **Update**.
4. Click **OK** to close the **Modify Material Catalog** dialog box.  
Tekla Structures asks if you want to save the changes to the model folder.
5. Click **OK** in the **Save confirmation** dialog box to save the changes.  
The modified material catalog is saved in the current model folder and is available only for that model. To make the modified catalog available for all the other models, use export and import.

**See also** [Adding a material grade on page 256](#)

[Copying a material grade on page 257](#)

[Deleting a material grade on page 258](#)

## Deleting a material grade

To delete a material grade:

1. Click **Modeling** --> **Material Catalog...** to open the **Modify Material Catalog** dialog box.
2. Select the material grade that you want to delete.
3. Right-click and select **Delete Grade**.
4. Click **OK** to close the **Modify Material Catalog** dialog box.
5. Click **OK** in the **Save confirmation** dialog box to save the changes.

See also [Adding a material grade on page 256](#)  
[Copying a material grade on page 257](#)  
[Modifying a material grade on page 257](#)

## Adding user attributes to material grades

You can add user attributes and their values to the material grades. The user attributes can then be used, for example, in filtering.

To add a user attribute to a material grade:

1. Click **Modeling** --> **Material Catalog...** to open the **Modify Material Catalog** dialog box.
2. On the **User attributes** tab, click **Definitions...** to open the **Modify Material Properties** dialog box.
3. Click **Add** to add a new row.
4. To define a user attribute, click each item on a row.
  - a. In the **Category** list, select a material category to which the user attribute is applied.
  - b. In the **Design code** list, select a design code to which the attribute is added.
  - c. In the **Material type** list, select a material type for the attribute.
  - d. In the **Quantity type** list, select the type of information that the user attribute contains, for example, weight, area, ratio, or string.
  - e. In the **Order** column, define the order in which the user attributes are shown in the dialog box. Smaller values are shown first.
  - f. In the **Property name** column, define a name for the property.

The name is saved in the catalog and can be used in reports and templates. When **Property name** is used in a template, `MATERIAL.PROPERTY_NAME` indicates where the property name appears.
  - g. In the **Label** column, define a label for the attribute.
5. Click **Update**.
6. Click **OK** to close the **Modify Material Properties** dialog box.

See also [Modifying a material grade on page 257](#)

## 9.3 Importing and exporting material grades

Use importing and exporting for merging material catalogs. Material catalogs are imported and exported as `.lis` files.

Importing and exporting is useful when you:

- upgrade to a newer version of Tekla Structures and want to use a customized material catalog from a previous version
- want to combine material catalogs that are stored in different locations
- want to share material catalog information with other users
- want to combine material catalogs across different environments.



You can also download or share material grades using Tekla Warehouse.

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**See also** [Importing a material catalog on page 260](#)  
[Exporting a material catalog on page 261](#)  
[Exporting a part of the material catalog on page 261](#)  
[Units used in import and export on page 177](#)

## Importing a material catalog

Material catalogs are imported to Tekla Structures models as `.lis` files. You can move an exported `.lis` file to any model folder and import it to an existing material catalog.

To import a material catalog:

1. Open the model to which you want to import a material catalog.
2. Click **Modeling --> Material Catalog...** to open the **Modify Material Catalog** dialog box.
3. Click **Import....**
4. Browse for the folder that contains the import file, and select the file.
5. Click **OK**.

If a material with a same name as the material being imported already exists, the **Import confirmation** dialog box appears and you have three options:

- **Replace:** The existing material is replaced with the imported material.
- **Merge:** Material properties that are different in the import file are added to the existing material. All the other properties remain unchanged.

Use this option to import only certain elements of the material catalog, such as user attributes.

- **Leave:** The existing material is not replaced and the material definitions in the import file are ignored.

If you select the **Apply for all** check box, Tekla Structures uses the same option (**Replace**, **Merge**, or **Leave**) for all the existing materials that have the same name as the one being imported.

If a user attribute with a different definition already exists, you are prompted to **Replace** or **Leave** the existing attribute.

6. Click **OK** to close the **Modify Material Catalog** dialog box.
7. Click **OK** in the **Save confirmation** dialog box to save the changes.

**See also** [Exporting a material catalog on page 261](#)

[Exporting a part of the material catalog on page 261](#)

[Units used in import and export on page 177](#)

## Exporting a material catalog

Exporting and importing are used to merge material catalogs. Material catalogs are exported from Tekla Structures models as `.lis` files. Note that the **Export...** command exports the entire catalog.

To export a material catalog:

1. Click **Modeling** --> **Material Catalog...** to open the **Modify Material Catalog** dialog box.
2. Click **Export....**
3. Browse for the folder where you want to save the exported file.  
By default, the file is save to the current model folder.
4. Enter a name for the file and click **OK**.
5. Click **OK** to close the **Modify Material Catalog** dialog box.
6. Click **OK** in the **Save confirmation** dialog box to save the changes.

**See also** [Exporting a part of the material catalog on page 261](#)

[Importing a material catalog on page 260](#)

[Units used in import and export on page 177](#)

## Exporting a part of the material catalog

If you do not want to export the whole material catalog, you can export a branch of the material tree, meaning all the material grades grouped under one material type, or a single material grade. Material catalogs are exported from Tekla Structures models as `.lis` files.

To export a part of the material catalog:

1. Click **Modeling --> Material Catalog...** to open the **Modify Material Catalog** dialog box.
2. Select material grades to be exported.
  - To export a branch of the material tree, right-click the branch and select **Export Grades**.
  - To export a single material grade, right-click the material grade and select **Export Grade**.
3. Browse for the folder where you want to save the export files.  
By default, the file is saved to the current model folder.
4. Enter a name for the file and click **OK**.
5. Click **OK** to close the **Modify Material Catalog** dialog box.
6. Click **OK** in the **Save confirmation** dialog box to save the changes.

See also [Exporting a material catalog on page 261](#)  
[Importing a material catalog on page 260](#)  
[Units used in import and export on page 177](#)

## 9.4 Creating user-defined material definitions

You can replace the existing material definitions with your own definitions and use them, for example, in drawing part marks. Material definitions can contain text, numbers and symbols.

To create user-defined material definitions:

1. Save the symbol file `user_material_symbols.sym` in the symbol folder (usually the folder `..\ProgramData\Tekla Structures\<version>\environments\common\symbols\`).
2. Create a text file that contains your material definitions.

Create the file using a text editor, for example Microsoft Notepad.

Each row in the file defines a material. Use the following syntax: `material_name symbol_file_name@n`, where

- `material_name` is the name of the material used in the material catalog
- `symbol_file_name` is the symbol file name to be used

- $n$  is the number of the symbol.

For example:

```
S235JRG1 user_material_symbols@1 B
S235JRG2 user_material_symbols@2 C
S235JR   user_material_symbols@0 A
S275JR   user_material_symbols@3 D
S355JR   user_material_symbols@4 E
```



The order of material names in the definition file is relevant to the conversion. Materials with more specific names need to be listed before the ones with similar, but simpler names, for example, S235JRG1 must be listed before S235JR. Otherwise they both get the same symbol.

---

3. Save the file for example with the name `user_material_definitions.txt`.

All the named materials in the material catalog will be replaced with the ones defined in this file.

4. Set the name of the file as a value for the advanced option  
`XS_MATERIAL_SYMBOL_REPRESENTATION_FILE` in **Tools --> Options --> Advanced Option...** --> **Drawing Properties** as follows:

```
set
XS_MATERIAL_SYMBOL_REPRESENTATION_FILE=user_material_definitions.txt
```

You can also enter a full path to the material definition file. Without the path Tekla Structures searches for the file in the model, firm, project, and system folders.

See also [Material grades on page 255](#)

Symbols in drawings

# 10 Bolt assemblies

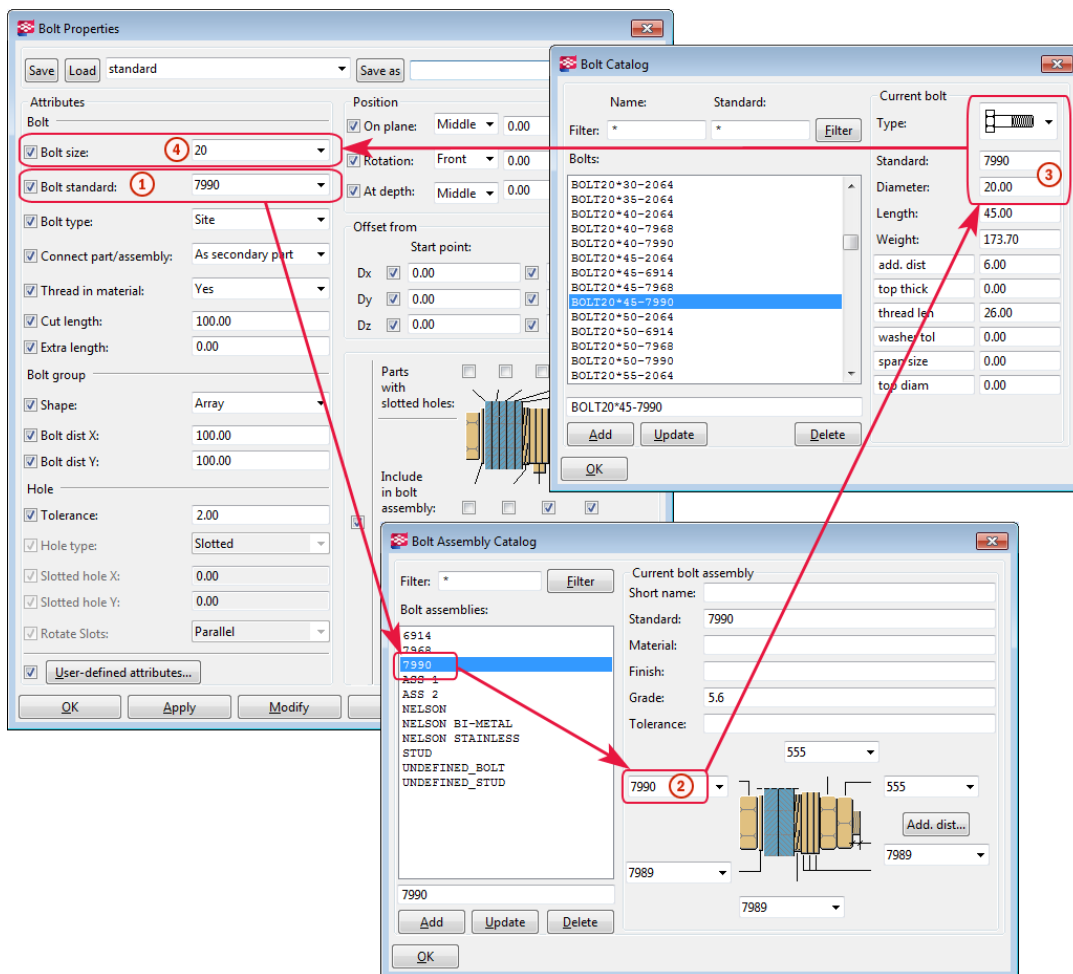
The individual *bolt assembly elements*, such as bolts of different sizes and lengths, nuts and washers, are listed in the bolt catalog. Each *bolt assembly* then consists of these bolt assembly elements. You cannot use a bolt if it does not belong to a bolt assembly. The bolt assemblies are listed in the bolt assembly catalog.

Tekla Structures stores the bolt catalog information in the `screwdb.db` file and the bolt assembly catalog information in the `assdb.db` file.

**See also** [How the bolt catalog and bolt assembly catalogs work together on page 264](#)  
[Managing bolts and bolt assemblies on page 265](#)  
[Importing and exporting bolts and bolt assemblies on page 270](#)  
[Bolt length calculation on page 275](#)



## 10.1 How the bolt catalog and bolt assembly catalogs work together



- ① The **Bolt standard** options are read from the bolt assembly catalog.
- ② The bolt assembly catalog defines which bolt standard is used in the bolt assembly.
- ③ The bolt catalog contains the different bolt diameters, lengths, and other properties used in the bolt standard.
- ④ The **Bolt size** options are read from the bolt catalog depending on the selected **Bolt standard** option.

See also [Bolt assemblies on page 264](#)

[Bolt catalog properties on page 278](#)

[Bolt assembly catalog properties on page 279](#)

## 10.2 Managing bolts and bolt assemblies

This section describes how to manage bolts and bolt assemblies using the bolt catalog and the bolt assembly catalog. You can add, modify, and delete bolts and bolt assemblies.

Click the links below to find out more:

[Adding a bolt to the catalog on page 266](#)

[Adding a stud bolt to the catalog on page 267](#)

[Modifying bolt information in the catalog on page 268](#)

[Deleting a bolt from the catalog on page 268](#)

[Adding a bolt assembly to the catalog on page 269](#)

[Modifying bolt assembly information in the catalog on page 269](#)

[Deleting a bolt assembly from the catalog on page 270](#)

### Adding a bolt to the catalog

To add a new bolt to the bolt catalog:

1. Click **Detailing** --> **Bolts** --> **Bolt Catalog...** to open the **Bolt Catalog** dialog box.
2. Enter the name of the bolt in the following box:

The image shows a screenshot of a software dialog box. At the top is a single-line text input field. Below the input field are three buttons arranged horizontally: 'Add', 'Update', and 'Delete'. The buttons have a light gray background and a thin border.

You can enter a maximum of 40 characters in the name box.

3. Define the other properties of the new bolt.

You can enter a maximum of 25 characters in the **Standard** box.

4. Click **Add** to add the bolt to the bolt catalog.

You cannot use a bolt if it does not belong to a bolt assembly. Therefore, we recommend checking that the catalog also includes nuts and washers that work with the new bolt so that you can create a bolt assembly. If the catalog does not include suitable nuts and washers, add them the same way as you added the new bolt.

5. Click **OK**.

The **Save confirmation** dialog box appears.

6. Select **Save changes to model folder** to save the changes in the `screwdb.db` file in the current model folder, and then click **OK**.



You can also add bolts by importing them to the bolt catalog.

---

**See also** [Importing bolts to the catalog on page 271](#)  
[Adding a stud bolt to the catalog on page 267](#)  
[Modifying bolt information in the catalog on page 268](#)  
[Deleting a bolt from the catalog on page 268](#)  
[Bolt length calculation on page 275](#)  
[Bolt catalog properties on page 278](#)  
[Adding a bolt assembly to the catalog on page 269](#)

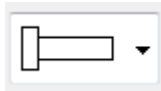
## Adding a stud bolt to the catalog

A stud is special type of bolt that is welded to steel parts to transfer loads between steel and concrete. You cannot use studs unless you have defined a stud assembly that contains the assembly's name and material.

To add a stud:

1. Click **Detailing --> Bolts --> Bolt Catalog...** to open the **Bolt Catalog** dialog box.
2. Enter values for the following properties:

- **Name:** Name for the stud bolt.

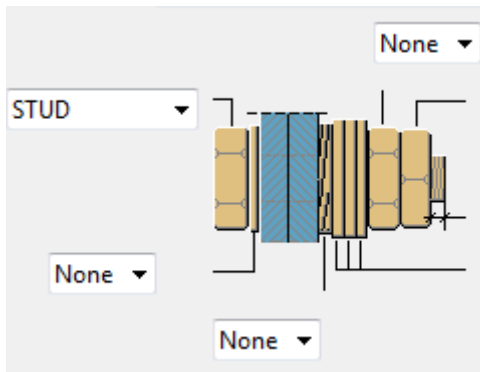


- **Type:**
- **Standard:** This name is needed when creating a bolt assembly for the stud.
- **Diameter:** Shank diameter.
- **Length:** Stud length.
- **Weight:** Stud weight.
- **top thick:** Head thickness.
- **top diameter:** Head diameter.

The units depend on the settings in **Tools --> Options --> Options --> Units and decimals**.

3. Click **Detailing --> Bolts --> Bolt Assembly Catalog** to open the **Bolt Assembly Catalog** dialog box.
4. Select the standard for the stud bolt.

- Set all the other bolt assembly parts to **None**.



- To create studs in the model, create bolts and select the stud assembly standard.

**See also** [Bolt catalog properties on page 278](#)

## Modifying bolt information in the catalog

To modify bolt information in the bolt catalog:

- Click **Detailing** --> **Bolts** --> **Bolt Catalog...** to open the **Bolt Catalog** dialog box.
- Select a bolt from the list.
- Modify the properties.
- Click **Update**.
- Click **OK**.

The **Save confirmation** dialog box appears.

- Select **Save changes to model folder** to save the changes in the `screddb.db` file in the current model folder, and then click **OK**.

**See also** [Adding a bolt to the catalog on page 266](#)

[Deleting a bolt from the catalog on page 268](#)

[Bolt catalog properties on page 278](#)

## Deleting a bolt from the catalog

To delete a bolt from the bolt catalog:

- Click **Detailing** --> **Bolts** --> **Bolt Catalog...** to open the **Bolt Catalog** dialog box.
- Select a bolt from the list.

Use the **Shift** and **Ctrl** keys to select multiple bolts.

3. Click **Delete**.
4. Click **OK**.

The **Save confirmation** dialog box appears.

5. Select **Save changes to model folder** to save the changes in the `screddb.db` file in the current model folder, and then click **OK**.

**See also** [Adding a bolt to the catalog on page 266](#)

[Modifying bolt information in the catalog on page 268](#)

## Adding a bolt assembly to the catalog

You can add new bolt assemblies to the bolt assembly catalog. Note that the bolt assembly can contain only bolts or studs, not both of them.

To add a bolt assembly:

1. Click **Detailing** --> **Bolts** --> **Bolt Assembly Catalog...** to open the **Bolt Assembly Catalog** dialog box.
2. Enter the name of the bolt assembly in the following box:

The image shows a screenshot of a software dialog box titled "Bolt Assembly Catalog". It features a single-line text input field at the top. Below the input field are three buttons arranged horizontally: "Add", "Update", and "Delete". The buttons have a light gray background and a thin border.

3. Define the other properties of the new bolt assembly.  
You can enter a maximum of 30 characters in the **Standard** box. For all the other properties, you can enter a maximum of 25 characters.
4. Click **Add** to add the bolt assembly to the catalog.
5. Click **OK**.  
The **Save confirmation** dialog box appears.
6. Select **Save changes to model folder** to save the changes in the `assdb.db` file in the current model folder, and then click **OK**.

**See also** [Modifying bolt assembly information in the catalog on page 269](#)

[Deleting a bolt assembly from the catalog on page 270](#)

[Bolt assembly catalog properties on page 279](#)

## Modifying bolt assembly information in the catalog

To modify a bolt assembly:

1. Click **Detailing** --> **Bolts** --> **Bolt Assembly Catalog...** to open the **Bolt Assembly Catalog** dialog box.
2. Select a bolt assembly from the list.
3. Modify the properties.
4. Click **Update**.
5. Click **OK**.

The **Save confirmation** dialog box appears.

6. Select **Save changes to model folder** to save the changes in the `assdb.db` file in the current model folder, and then click **OK**.

**See also** [Adding a bolt assembly to the catalog on page 269](#)  
[Deleting a bolt assembly from the catalog on page 270](#)

## Deleting a bolt assembly from the catalog

To delete a bolt assembly:

1. Click **Detailing** --> **Bolts** --> **Bolt Assembly Catalog...** to open the **Bolt Assembly Catalog** dialog box.
2. Select a bolt assembly from the list.
3. Click **Delete**.
4. Click **OK**.

The **Save confirmation** dialog box appears.

5. Select **Save changes to model folder** to save the changes in the `assdb.db` file in the current model folder, and then click **OK**.

**See also** [Adding a bolt assembly to the catalog on page 269](#)  
[Modifying bolt assembly information in the catalog on page 269](#)

## 10.3 Importing and exporting bolts and bolt assemblies

Use importing and exporting for merging bolts and bolt assemblies across catalogs. Bolts are imported and exported as `.bolts` files, bolt assemblies as `.bass` files, and bolt catalogs as `.lis` files.

When you export single bolts or bolt assemblies, you can select the bolts or bolt assemblies you want to include in the `.bolts` or `.bass` file. When you import and export bolt assemblies, also the related bolts are included in the `.bass` file.

You can import and export an entire bolt catalog. You can also import a part of an exported bolt catalog.

Importing and exporting bolt catalogs is useful, when you:

- Upgrade to newer version of Tekla Structures and you want to use a customized bolt catalog from a previous version.
- Want to combine bolt catalogs that are stored in different locations.
- Want to share bolt catalog information with other users.



You can also download or share bolt assemblies using Tekla Warehouse.

---

**See also** [Importing bolts to the catalog on page 271](#)

[Exporting bolts from the catalog on page 272](#)

[Importing bolt assemblies to the catalog on page 272](#)

[Exporting bolt assemblies from the catalog on page 273](#)

[Importing a bolt catalog on page 273](#)

[Importing a part of the bolt catalog on page 274](#)

[Exporting a bolt catalog on page 275](#)

## Importing bolts to the catalog

Bolts are imported and exported as `.bolts` files. A `.bolts` file can include one bolt or several bolts.

To import bolts to the catalog:

1. Click **Detailing --> Bolts --> Bolt Catalog...** to open the **Bolt Catalog** dialog box.
2. Right-click in the **Bolts** list and select **Import**.
3. Select the import file.
4. Click **OK**.

The bolts are displayed on the **Bolts** list by their original names.

5. Click **OK**.

The **Save confirmation** dialog box appears.

6. Select **Save changes to model folder** to save the changes in the `screwdb.db` file in the current model folder, and then click **OK**.

**See also** [Adding a bolt to the catalog on page 266](#)  
[Importing a bolt catalog on page 273](#)  
[Importing a part of the bolt catalog on page 274](#)  
[Importing bolt assemblies to the catalog on page 272](#)  
[Exporting bolts from the catalog on page 272](#)

## Exporting bolts from the catalog

Bolts are imported and exported as `.bolts` files. A `.bolts` file can include one bolt or several bolts.

To export bolts from the catalog:

1. Click **Detailing** --> **Bolts** --> **Bolt Catalog...** to open the **Bolt Catalog** dialog box.
2. Select bolts from the **Bolts** list.  
Use the **Shift** and **Ctrl** keys to select multiple bolts.
3. Right-click in the **Bolts** list and select **Export**.
4. Browse for the folder where you want to save the export file.
5. Enter a name for the file in the **Selection** box.
6. Click **OK**.

**See also** [Exporting bolt assemblies from the catalog on page 273](#)  
[Exporting a bolt catalog on page 275](#)  
[Importing bolts to the catalog on page 271](#)

## Importing bolt assemblies to the catalog

Bolt assemblies are imported and exported as `.bass` files. A `.bass` file can include one bolt assembly or several bolt assemblies.

To import bolt assemblies:

1. Click **Detailing** --> **Bolts** --> **Bolt Assembly Catalog...** to open the **Bolt Assembly Catalog** dialog box.
2. Right-click in the **Bolt assemblies** list and select **Import**.
3. Select the import file.



4. Click **OK**.

The bolt assemblies are displayed on the **Bolt assemblies** list by their original names.

5. Click **OK**.

The **Save confirmation** dialog box appears.

6. Select **Save changes to model folder** to save the changes in the `assdb.db` file in the current model folder, and then click **OK**.

**See also** [Adding a bolt assembly to the catalog on page 269](#)

[Importing a bolt catalog on page 273](#)

[Importing bolts to the catalog on page 271](#)

[Exporting bolt assemblies from the catalog on page 273](#)

## Exporting bolt assemblies from the catalog

Bolt assemblies are imported and exported as `.bass` files. A `.bass` file can include one bolt assembly or several bolt assemblies.

To export bolt assemblies:

1. Click **Detailing --> Bolts --> Bolt Assembly Catalog...** to open the **Bolt Assembly Catalog** dialog box.
2. Select bolt assemblies from the **Bolt assemblies** list.  
Use the **Shift** and **Ctrl** keys to select multiple bolt assemblies.
3. Right-click in the **Bolt assemblies** list and select **Export**.
4. Browse for the folder where you want to save the export file.
5. Enter a name for the file in the **Selection** box.
6. Click **OK**.

**See also** [Exporting a bolt catalog on page 275](#)

[Exporting bolts from the catalog on page 272](#)

[Importing bolt assemblies to the catalog on page 272](#)

## Importing a bolt catalog

Bolt catalogs are imported to Tekla Structures models as `.lis` files.

To import a bolt catalog:

1. Open the model to which you want to import a bolt catalog.

2. Copy the `screwdb.lis` file that you want to import to the current model folder.
3. Click **Detailing --> Bolts --> Import Bolt Catalog** to import the bolt catalog file `screwdb.lis` from the current model folder.

Tekla Structures does not replace the entries that have the same names as the entries in the import file.

4. Check the status bar for error messages.

To view errors, click **Tools --> Display Log File --> Session History...** .

**See also** [Importing a part of the bolt catalog on page 274](#)

[Exporting a bolt catalog on page 275](#)

## Importing a part of the bolt catalog

If you do not want to import the entire bolt catalog, you can select the parts to be imported.



If you only want to import a few bolts or bolt assemblies, use the import and export commands of the corresponding catalogs.

---

To import a part of the bolt catalog:

1. Open the model that contains the bolt catalog you want to use.
2. Click **Detailing --> Bolts --> Export Bolt Catalog** .  
The bolt catalog is saved as the `screwdb.lis` file in the current model folder.
3. Open the `screwdb.lis` file using a text editor, for example, Microsoft Notepad.  
Each entry is listed on a separate row.
4. Delete the unwanted rows from the file.



Do not delete the `STARTLIST` and `ENDLIST` rows.

- 
5. Save the file with the name `screwdb.lis`.
  6. Open the model to which you want to import the bolt catalog.
  7. Copy the `screwdb.lis` file that you want to import to the current model folder.
  8. Click **Detailing --> Bolts --> Import Bolt Catalog** to import the bolt catalog file `screwdb.lis` from the current model folder.

**See also** [Importing bolts to the catalog on page 271](#)

[Importing bolt assemblies to the catalog on page 272](#)

[Importing a bolt catalog on page 273](#)

[Exporting a bolt catalog on page 275](#)

## Exporting a bolt catalog

Bolt catalogs are exported from Tekla Structures models as `.lis` files.

To export a bolt catalog:

1. Open the model that contains the bolt catalog you want to export.
2. Click **Detailing** --> **Bolts** --> **Export Bolt Catalog**.

The exported bolt catalog is the `screwdb.lis` file in the current model folder.



The **Export Bolt Catalog** command exports the entire bolt catalog. To export only part of the bolt catalog, modify the export file to contain only the required elements. You can also export bolts from the **Bolt Catalog** dialog box or bolt assemblies from the **Bolt Assembly Catalog** dialog box.

---

**See also** [Exporting bolt assemblies from the catalog on page 273](#)

[Exporting bolts from the catalog on page 272](#)

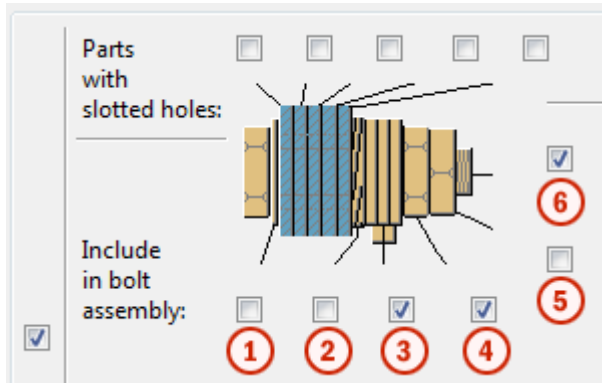
[Importing a bolt catalog on page 273](#)

[Importing a part of the bolt catalog on page 274](#)

## 10.4 Bolt length calculation

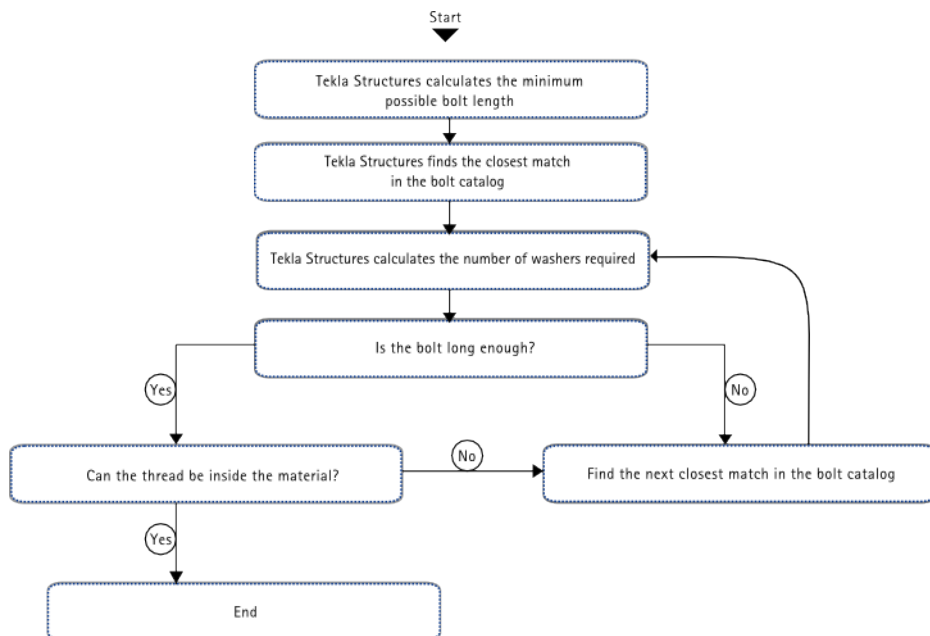
Tekla Structures uses values from the bolt catalog and the bolt assembly catalog when calculating the bolt length. If the bolt catalog does not contain long enough bolts for your purposes, you need to add them to the bolt catalog.

The following settings in the **Bolt Properties** dialog box affect the bolt length calculation process. If the check box is selected, the part is used in the bolt assembly.



- ① Washer (1)
- ② Washer (2)
- ③ Washer (3)
- ④ Nut (1)
- ⑤ Nut (2)
- ⑥ If the check box is clear, only a hole is created

The chart and the detailed steps below explain the process of bolt length calculation.



1. Tekla Structures calculates the **minimum possible length** of the bolt as follows:
  - washer (1) thickness (if the check box is selected) +
  - material thickness +
  - washer (2) thickness (if the check box is selected) +
  - washer (3) thickness (if the check box is selected) +
  - nut (1) thickness +
  - nut (2) thickness +
  - extra length
2. Tekla Structures searches for the **closest match** in the bolt catalog.
3. Tekla Structures calculates the **number of washers required** (must not exceed 10) so that the **length of the shaft is less than**:
  - nut (1) thickness +
  - material thickness +
  - nut (2) thickness +
  - washer (1) thickness +
  - washer (2) thickness +
  - (number of washers\*washer (3) thickness)
4. Tekla Structures checks that the **bolt found in step 2 is longer than**:
  - extra length +
  - nut (1) thickness +
  - material thickness +
  - nut (2) thickness +
  - add. dist (from the bolt catalog) +
  - washer (1) thickness +
  - washer (2) thickness +
  - (number of fitting washers \* washer (3) thickness)
5. If the selected bolt does not fulfill the criteria in step 4, Tekla Structures returns to step 2, otherwise it continues on to step 6.
6. Tekla Structures checks that the selected bolt fulfills **all the following conditions**:
  - Can the thread be inside the material to be connected? Even if this is **not** allowed, the calculation always allows 3 or 4 mm of thread to be inside the material, depending on the bolt diameter. If the bolt diameter is  $\geq 24$  mm, it allows 4 mm, otherwise it allows 3 mm.
  - Shaft length must be more than:
    - material thickness +

extra length +

washer (1) thickness (if checked) -

maximum thread in material allowed (if thread in material = no) = 3 mm or 4 mm

- Shaft length is calculated as:

Screw length - screw thread length - thread end.

- Thread end is the part of the bolt between the shaft and the thread. It is calculated as follows:

Diameter of bolt (mm)	Thread end (mm)
>33.0	10.0
>27.0	8.0
>22.0	7.0
>16.0	6.0
>12.0	5.0
>7.0	4.0
>4.0	2.5
≤4	1.5

7. If the selected bolt does not fulfill **all** the above conditions, Tekla Structures returns to step 2 and tries the next longest bolt.
8. If the advanced option `XS_BOLT_LENGTH_EPSILON` is set, the epsilon thickness is added to, or subtracted from, the material thickness to avoid inaccurate bolt length calculation.

For example, if this value is not taken into account, and the calculated length is 38.001 mm, a 39 mm bolt might be selected.

**See also** [How the bolt catalog and bolt assembly catalogs work together on page 264](#)  
[Adding a bolt to the catalog on page 266](#)

## 10.5 Bolt catalog properties

Use the **Bolt Catalog** dialog box to view and modify the properties of individual bolt elements, such as bolts, washers, and nuts. The units depend on the settings in **Tools --> Options --> Options --> Units and decimals**.

Option	Description
Type	The type of the bolt part.

Option	Description
<b>Standard</b>	This name is the full name which is shown in the bolt assemblies list in the <b>Bolt Assembly Catalog</b> dialog box, and in the <b>Bolt standard</b> list in the <b>Bolt Properties</b> dialog box. The value is used in bolt length calculation.
<b>Diameter</b>	The diameter of the bolt part.
<b>Length</b>	The length of the bolt part.
<b>Weight</b>	The weight of the bolt part.
<b>add. dist</b>	The length of the part of the bolt that protrudes from the nut. The value is used in bolt length calculation.
<b>top thick</b>	The thickness of the bolt head.
<b>thread len</b>	The length of the threaded part of the bolt shaft. The value is not used in bolt length calculation (value is 0) if the bolt is fully-threaded.
<b>washer tol</b>	The tolerance between the washer inner diameter and the bolt diameter. The value is used when searching for the correct-sized washer for the bolt. Not used in bolt length calculation.
<b>span size</b>	The size of the wrench needed.
<b>calc thick</b>	The calculation thickness of a nut or a washer. This value is used in bolt length calculation.
<b>real thick</b>	The true thickness of a nut or a washer. This is for information only.
<b>inner diam</b>	The inner diameter of a nut or a washer. This is for information only.
<b>outer diam</b>	The outer diameter of a nut or a washer. This is for information only.
<b>top diam</b>	The diameter of the hexagon. This is for information only.

See also [Adding a bolt to the catalog on page 266](#)

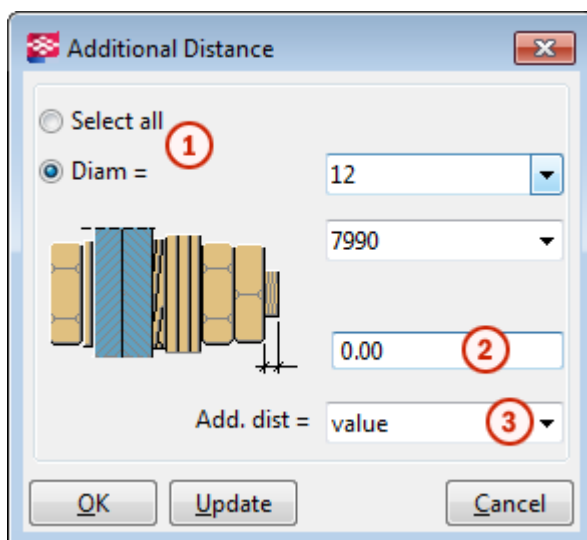
## 10.6 Bolt assembly catalog properties

Use the **Bolt Assembly Catalog** dialog box to view and modify the properties of bolt assemblies. The units depend on the settings in **Tools --> Options --> Options --> Units and decimals**.

Option	Description
<b>Short name</b>	This name is used in drawings and reports. It is usually the commercial name for a specific bolt.
<b>Standard</b>	This name is the full name which is shown in the bolt assemblies list in the <b>Bolt Assembly Catalog</b> dialog box, and in the <b>Bolt standard</b> list in the <b>Bolt Properties</b> dialog box.  The value is used in bolt length calculation.
<b>Material</b>	The material of the bolt assembly.
<b>Finish</b>	The type of the finish.
<b>Grade</b>	The grade of the bolt assembly.
<b>Tolerance</b>	The tolerances of the bolt assembly.

Additional length  
for bolt  
calculation

Option	Description
<b>Add. dist...</b>	The <b>Additional Distance</b> option controls how much of the bolt protrudes from the nut.  <b>Additional Distance</b> updates the <b>Additional Distance</b> values of all bolts that use the selected bolt standard and have the selected diameter.  The value is used in bolt length calculation.



- 1 Select whether the value of the additional length affects all or individual diameters of one bolt assembly.
- 2 Enter the additional length value.
- 3 Select whether the value is absolute or relative to the diameter.

See also [Adding a bolt assembly to the catalog on page 269](#)



# 1 1 Disclaimer

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