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About Tekla Structures

Tekla Structures is a tool for structural engineers, detailers, and fabricators. It is an integrated model-based 3D solution for managing multi-material databases (steel, concrete, timber, etc.). Tekla Structures features interactive modeling, structural analysis and design, and automatic drawing creation.

You can automatically produce drawings and reports from the 3D model, at any time. Drawings and reports react to modifications in the model, and are always up to date.

Tekla Structures includes a wide range of standard drawing and report templates. You can also create your own templates using the Template Editor.

Tekla Structures supports multiple users working on the same project. You and your partners can work together on the same model, at the same time, even in different locations. This increases accuracy and quality, because you always use the most up-to-date information.

See also
- Main features on page 7
- Configurations on page 8
- Roles on page 8
- Languages on page 9
- Environments on page 10
- Single-user mode vs multi-user mode on page 12

1.1 Main features

Tekla Structures includes the following features:

- Easy modeling of basic objects, such as beams, columns, and slabs.
- Useful modeling aids, such as 3D grids and an adjustable work area.
- Catalogs of available material grades, profiles, bolts, and reinforcements.
- Modeling tools to create complex structures, such as staircases and trusses.
• Intelligent connections, such as end plates and clip angles, to automatically connect main members.
• A custom component editor that you can use to create your own parametric connections, details, and parts.
• Links to transfer data between Tekla Structures and other software, such as AutoCAD, STAAD, and MicroStation.
• Drawing tools to create several drawings with one click.
• Data output for CNC machines.
• Capability to undo and redo changes you have made, so that you can test solutions, and revert to the original if needed.
• Tekla Structures is available in a wide range of languages, and adapted to local standards and requirements.

See also Interface overview on page 13

### 1.2 Configurations

Tekla Structures is available in different configurations to suit the various players in the construction industry. When you log in to Tekla Structures, select the configuration you want to use.

See also Tekla Structures configurations

### 1.3 Roles

In some environments, when you start Tekla Structures 21.0, you can select a role you want to use. The user interface has been customized for each role.

The list of roles may be different in each environment, but typically the following roles are available:

• All
• Concrete Contractor
• Construction Management
• Engineer
• Precast Concrete Detailer
• Rebar Detailer
• Steel Detailer

**All** is a combination of all roles.
1.4 Languages

Tekla Structures 21.0 software is available in the following languages:

- Chinese – simplified (chs)
- Chinese – traditional (cht)
- Czech (csy)
- Dutch (nld)
- English (enu)
- French (fra)
- German (deu)
- Hungarian (hun)
- Italian (ita)
- Japanese (jpn)
- Polish (plk)
- Portuguese (ptg)
- Portuguese – Brazilian (ptb)
- Russian (rus)
- Spanish (esp)

Some language-dependent file and folder names include the abbreviations listed above.

See also Changing the language of the user interface on page 9

Changing the language of the user interface

You can change the language of the Tekla Structures user interface at any time.

To change the language of the user interface:

1. Click Tools --> Change Language...
2. Select a language from the Language list.
3. Click OK.
4. Restart Tekla Structures for the change to take effect.

See also Languages on page 9
1.5 Environments

The environment means region-specific settings and information. It defines which profiles, material grades, default values, connections, wizards, variables, reports, and templates you use.

When you install Tekla Structures, you can choose the environments you want to use. The environments available in Tekla Structures 21.0 are:

- Default environment
- Australasia
- Austria
- Brazil
- China
- Czech
- Denmark
- Finland
- France
- Germany
- Greece
- Hungary
- India
- Italy
- Japan
- Korea
- Middle-East
- Netherlands
- Netherlands (English)
- Norway
- Poland
- Portugal
- Russia
- South Africa
- South America
- South-East Asia
- Spain
• Sweden
• Switzerland
• Taiwan
• United Kingdom
• United States (Imperial)
• United States (Metric)

See also  Blank project on page 11

Blank project
The blank project is a Tekla Structures environment that includes only generic content, such as parametric profiles and undefined materials, and that can be used for gathering region-, company-, or project-specific settings, tools, and information. The blank project is included in the Tekla Structures software installation.

You can use Tekla Warehouse to download or install content to the blank project. For example, you can download or install profiles, material grades, bolts, reinforcement, components, tools, and templates from Tekla Warehouse across all Tekla Structures environment- and manufacturer-specific collections, and make combinations that suit your needs.

You can download or install content from Tekla Warehouse either before starting the project to your project and firm folders, or during the project to the model folder.

To start building or to use your own project settings, select blank project in the Environment list when you start Tekla Structures:
1.6 Single-user mode vs multi-user mode

Tekla Structures can be used in either single-user or multi-user mode.

When one user at a time is to work with a model, Tekla Structures should be run in single-user mode. In single-user mode, only one user can work with each model at any time.

If several users will work with a model simultaneously, you can choose to run Tekla Structures in multi-user mode. We recommend that you only run Tekla Structures in multi-user mode if the users will make use of the additional features of multi-user mode.

To run Tekla Structures in multi-user mode, one machine in the network has to be set up as a server running the Tekla Structures server program.

See also
2 Interface overview

This section provides an overview of the Tekla Structures user interface and its basic features.

Click the links below to find out more:
- Toolbars on page 13
- Mini Toolbar on page 15
- Tooltips on page 19
- Status bar on page 21
- Warning messages on page 22
- Customizing the interface on page 22

2.1 Toolbars

The toolbars contain buttons that give easy access to some of the most frequently-used commands. You can either dock the toolbars at the edges of the application window or leave them floating anywhere on your screen.

See also
- Showing and hiding a toolbar on page 13
- Moving a toolbar on page 15
- Resizing a toolbar on page 14
- Creating your own toolbar on page 23
**Showing and hiding a toolbar**

To show or hide a toolbar:

- Click **Tools** --> **Toolbars** and click the toolbar name.

Visible toolbars have a check mark beside their name.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>✅</td>
<td>Selecting</td>
</tr>
<tr>
<td>✅</td>
<td>Snapping</td>
</tr>
<tr>
<td></td>
<td>All Components</td>
</tr>
<tr>
<td></td>
<td>Modeling Tools</td>
</tr>
<tr>
<td></td>
<td>Assembly</td>
</tr>
</tbody>
</table>

**Resizing a toolbar**

You can resize toolbars that are floating.

To resize a floating toolbar:

1. Hold the mouse pointer over an edge of the toolbar until the pointer changes into a double-ended arrow.

2. Drag the edge of the toolbar to reach the desired size and shape.
Moving a toolbar

To move a toolbar, do one of the following:

<table>
<thead>
<tr>
<th>To</th>
<th>Do this</th>
</tr>
</thead>
<tbody>
<tr>
<td>Move a toolbar</td>
<td>Click the handle on the left or upper edge of a docked toolbar (or the title bar of a floating toolbar), and drag the toolbar to a new location.</td>
</tr>
<tr>
<td>Drag a toolbar beyond the program window</td>
<td>Hold down the Ctrl key while dragging the toolbar. The toolbar remains floating.</td>
</tr>
</tbody>
</table>

2.2 Mini Toolbar

The Mini Toolbar appears next to the mouse pointer when you click an object in a model or drawing.

The Mini Toolbar contains commands for modifying the most common object properties. You can customize the toolbar by hiding commands, and by adding macros and user-defined attributes.

If the properties cannot be modified using your current Tekla Structures configuration, they appear dimmed in the Mini Toolbar.

See also

- Showing and hiding the Mini Toolbar on page 15
- Changing the Mini Toolbar's position and distance on page 16
- Locking the Mini Toolbar's position on page 16
- Customizing the Mini Toolbar on page 17
Showing and hiding the Mini Toolbar

To show or hide the Mini Toolbar, do one of the following:

• Click Tools --> Options --> Mini Toolbar.
• Use the keyboard shortcut Ctrl+K.

See also  
Mini Toolbar on page 15
Changing the Mini Toolbar's position and distance on page 16
Locking the Mini Toolbar's position on page 16
Customizing the Mini Toolbar on page 17

Changing the Mini Toolbar's position and distance

You can change the position and distance the Mini Toolbar has in relation to the parts. For example, you could have it appear on the left side of the part.

To change the Mini Toolbar's position and distance:

1. Move the mouse pointer on the Mini Toolbar to display it.
2. Hold down the left mouse button. The mouse pointer changes into a cross with four arrows.
3. Hold down the Ctrl key and drag the Mini Toolbar to a new location.

See also  
Mini Toolbar on page 15
Locking the Mini Toolbar's position on page 16

Locking the Mini Toolbar's position

You can pin the Mini Toolbar to a specific location on the screen, so that the position is locked. For example, you could have it appear at the upper left corner of the screen. In the locked state, the position of the Mini Toolbar is independent of the individual part's location.

To lock the position of the Mini Toolbar:

1. Move the mouse pointer on the Mini Toolbar to display it.
2. Hold down the left mouse button.
   The mouse pointer changes into a cross with four arrows.
3. Drag the Mini Toolbar to a new location.
4. Click to pin the Mini Toolbar to the new location.
   The pin icon changes into when the position is locked.
Customizing the Mini Toolbar

You can customize the Mini Toolbar by selecting which commands are visible, and by adding macros and user-defined attributes to the toolbar.

To customize the Mini Toolbar:
1. Move the mouse pointer on the Mini Toolbar to display it.
2. Click to open the Customize Mini Toolbar dialog box.
3. Select the elements you wish to show or hide.
   The Preview area shows what the toolbar will look like.
4. Include macros and user-defined attributes in the Mini Toolbar.
   a. Select a macro or user-defined attribute in the list of macros and user-defined attributes.

   You can only add user-defined attributes whose type is string. You can find out the type of user-defined attributes in the objects.inp file.

   b. Click Add to Mini Toolbar after each selected macro and user-defined attribute.

   The added macros and user-defined attributes are shown in the list of visible elements.

   c. To remove macros and user-defined attributes from the Mini Toolbar, clear the check boxes next to them in the list of visible elements.
5. Click OK.

See also  Mini Toolbar on page 15

2.3 Common buttons

The common buttons located at the top and bottom of a dialog box affect all the tabs in the dialog box. For example, when you click Save before closing the dialog box, Tekla Structures saves all information on all tabs to the designated file.

The following table lists some common buttons that can be found in most of the Tekla Structures dialog boxes:
<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Apply</strong></td>
<td>Retains the properties in the dialog box without closing the dialog box. Tekla Structures uses these properties the next time you create an object of this type.</td>
</tr>
<tr>
<td><strong>Cancel</strong></td>
<td>Closes the dialog box without retaining the properties in the dialog box or modifying objects.</td>
</tr>
<tr>
<td><strong>Create</strong></td>
<td>Creates a new object using the properties in the dialog box.</td>
</tr>
<tr>
<td><strong>Get</strong></td>
<td>Fills the dialog box with the properties of the selected object. When you select several objects, Tekla Structures takes the properties at random from one of the selected objects.</td>
</tr>
<tr>
<td><strong>Help...</strong></td>
<td>Displays the help for the dialog box.</td>
</tr>
<tr>
<td><strong>Load</strong></td>
<td>Loads all previously stored properties to the dialog box. Tekla Structures also loads the properties of sub-dialog boxes, even if they are not open. You can select the name of the file you want to use from the list.</td>
</tr>
<tr>
<td><strong>Modify</strong></td>
<td>Modifies the selected objects using the properties in the dialog box, but does not retain the properties in the dialog box.</td>
</tr>
<tr>
<td><strong>OK</strong></td>
<td>Retains the properties in the dialog box and closes the dialog box. Tekla Structures uses these properties the next time you create an object of this type.</td>
</tr>
<tr>
<td><strong>Save</strong></td>
<td>Stores the modifications of properties. Tekla Structures saves the properties in the file shown in the list.</td>
</tr>
<tr>
<td><strong>Save as</strong></td>
<td>Stores the dialog box properties with the name given in the box. The Save as button also updates the Load list. This is important if you add or delete files manually. Tekla Structures stores the properties files in the model folder, also including the properties of sub-dialog boxes.</td>
</tr>
<tr>
<td></td>
<td>Switches all the check boxes in the dialog box on and off.</td>
</tr>
</tbody>
</table>

**See also**  
Saving dialog box properties on page 18  
Loading dialog box properties on page 19

**Saving dialog box properties**

To save the properties of a dialog box:

1. In the dialog box, enter the properties you want to save.
2. In the box next to the **Save as** button, enter a name for the set of properties.
3. Click **Save as**.
To overwrite an existing set of properties, click **Save**. Tekla Structures saves the properties in the file shown in the list.

**Loading dialog box properties**

To load a previously stored set of properties to the dialog box:

1. In the list next to the **Load** button, select the set of properties you want to load.
2. Click **Load**.

**See also**

- Loading dialog box properties on page 19
- Common buttons on page 17

---

**2.4 Tooltips**

When you rest the mouse pointer on a toolbar button, a *tooltip* appears. Tekla Structures contains three types of tooltips:

- **Basic tooltips on page 19**
- **Enhanced tooltips on page 20**
- **Menu tooltips on page 20**

**Basic tooltips**

Basic tooltips only display the name of the command. If the enhanced tooltips are switched on, the basic tooltips are not displayed.

**See also**

- Enhanced tooltips on page 20
- Menu tooltips on page 20
Enhanced tooltips

Enhanced tooltips give more information about the command and how it can be executed. They also give examples, hints and tips.

On the basis of the information in the enhanced tooltip you are able to decide whether the command is the one that you need for your current task. You can also open the related online help topic by clicking the More... button.

To show or hide the enhanced tooltips, click Tools --> Options --> Enhanced Tooltips. The enhanced tooltips are switched on by default.

See also  Basic tooltips on page 19
Menu tooltips on page 20

Menu tooltips

Menu tooltips provide the same functionality as the enhanced tooltips, but for menu commands. The menu tooltips are displayed in a separate window, which you can drag and
drop to any position on the screen. To display the corresponding menu tooltip, move the mouse pointer over a menu command.

To show or hide the menu tooltips window, click **Tools --> Options --> Menu Tooltips**.

**See also**  
Basic tooltips on page 19  
Enhanced tooltips on page 20

### 2.5 Status bar

Tekla Structures displays instructions and messages on the status bar located at the bottom of the Tekla Structures window.

Follow the instructions on the status bar when you use commands. For example, when you are creating a part, always check the status bar as Tekla Structures will prompt you on how to continue.
The level in assembly or component hierarchy (0–9)

The middle mouse button mode (Pan or Scroll)

The current phase

The number of selected objects and handles

To view the status bar message history, click Tools --> Toolbars --> Message Panel. A message panel appears at the bottom of the Tekla Structures window.

See also Using commands on page 27

2.6 Warning messages

Tekla Structures displays warning messages when necessary, for example when you are about to copy or move objects outside the work area.

To prevent Tekla Structures from displaying the warning messages again, select the Do not show this message again check box.

To re-display the warning messages, press Shift when the warning message should appear, for example when you are copying or moving objects outside the work area, and Tekla Structures displays the warning message again.

2.7 Customizing the interface

Once you are familiar with the Tekla Structures user interface, you can customize it to better suit your needs. You can create your own toolbars, menus and keyboard shortcuts that contain the commands you use regularly.

Click the links below to find out more:

- Creating your own toolbar on page 23
- Creating your own menu on page 24
Creating your own toolbar

You can create your own toolbars that include the commands you use frequently. The toolbars that you create are user-specific, which means that if someone else opens the same model, your toolbars are not visible. You can create as many toolbars as needed.

Do not modify the existing toolbars. Instead, create new ones.

Always create and modify drawing command toolbars in the modeling mode. If you create or modify toolbars in the drawing mode, the new toolbars and toolbar changes are not saved.

To create your own toolbar:

1. In the modeling mode, click Tools > Customize... to open the Customize dialog box.

2. On the Toolbars tab, click New....

A new toolbar with the name UserToolbar 1 appears in the toolbar tree. You can rename the toolbar by clicking it and entering a new name for it.

3. To add commands to the new toolbar, select a command from the list on the left, and then click the right arrow button.

If you do not find the commands you want to add, use the Category list to select command subgroups and the Filter box to search for commands.

- Use the left arrow button to remove commands from a toolbar.
- Use the up and down arrow buttons to move a command up or down in the toolbar tree.
- Use the line button to add a separator line above the selected command.
- Use the Delete button to delete a command you have added, or the whole toolbar.

4. Set the toolbar visible by selecting the Visible check box.

Tekla Structures uses the eye symbols to indicate whether a toolbar is visible.

5. When you have added the needed commands to the toolbar or created as many toolbars as needed, click Close.

See also  Creating your own menu on page 24
Creating your own menu

You can create your own menu that contains the commands you use frequently. You can create only one custom menu, and this menu is always called User.

Always create and modify the User menu in the modeling mode. If you create or modify the User menu in the drawing mode, the new User menu or menu changes are not saved.

To create your own menu:

1. In the modeling mode, click Tools > Customize... to open the Customize dialog box.
2. Click the Menu tab.
3. To add commands to the new menu, select a command from the list on the left, and then click the right arrow button.
   
   If you do not find the commands you want to add, use the Category list to select command subgroups and the Filter box to search for commands.
4. To modify the menu, do any of the following:
   - Use the left arrow button to remove commands from a menu.
   - Use the up and down arrow buttons to move a command up or down in the menu tree.
   - Use the line button to add a separator line above the selected command.
5. When you have added the needed commands to the menu, click Close.
6. Restart Tekla Structures to activate the menu.

The name of the menu is always User.

See also Creating your own toolbar on page 23

Assigning a keyboard shortcut for a command

In addition to many predefined keyboard shortcuts in Tekla Structures, you can define your own keyboard shortcuts. If you frequently use certain commands, assign keyboard shortcuts to them. Using keyboard shortcuts is faster than using the commands on toolbars and menus.

Before you can assign a keyboard shortcut to a command, you need to create a custom User menu. For more information, see Creating your own menu on page 24.

To assign a keyboard shortcut to a command:
1. Click **Tools > Customize...** to open the **Customize** dialog box.

2. Select a command from the list on the left.
   
   Use the **Category** list to select command subgroups.
   
   Use the **Filter** box to search for commands.

3. To assign a keyboard shortcut for the command, use the **Shortcut** boxes.
   
   You can use a single letter, or combine a letter with the **Shift**, **Alt** or **Ctrl** keys.

   The following keys are valid in keyboard shortcuts:
   
   • A–Z
   • 0–9
   • F1–F24
   • Left arrow, Right arrow, Up arrow, Down arrow
   • Backspace, Enter, Esc, Tab
   • Insert, Delete, Home, End, Page Up, Page Down
   • 0–9 on the numeric keypad
   • Multiply (*), Divide (/), Add (+), Subtract (-), Decimal (.)

4. To activate the new keyboard shortcut, add the command to the custom **User** menu.

5. Click **Close**.

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

*Example*  
To define + as a shortcut, enter `add` in the **Shortcut** box:

```plaintext
Shortcut:  add
```

To run the command, use the + key on the numeric keypad.

*See also*  
Keyboard shortcuts for common commands on page 29

Keyboard shortcuts for selecting objects on page 42

Keyboard shortcuts for copying and moving objects on page 64

Keyboard shortcuts for snapping on page 82
Changing the size of toolbar buttons
By default, the size of the buttons on the toolbars is 16x16 pixels. If the buttons look too small, you can change their size to 24x24 pixels.

To change the size of toolbar buttons:
1. Click Tools > Customize... to open the Customize dialog box.
2. Select the Large icons check box.
   The size of the buttons changes.
3. Click Close.

See also  
Customizing the interface on page 22  
Creating your own toolbar on page 23  
Creating your own menu on page 24
This section explains how to run, repeat, and end commands. Note that you can use some Tekla Structures commands simultaneously. For example, you can use the Zoom commands while creating objects.

Click the links below to find out more:

- Running a command on page 27
- Repeating a command on page 28
- Ending a command on page 28
- Undoing a command on page 28
- Redoing a command on page 29
- Keyboard shortcuts for common commands on page 29

### 3.1 Running a command

To run a command in Tekla Structures, do one of the following:

- Click the toolbar button of the command you want to run.

  For example, click ![Bolt Icon](image) to create bolts.

- Click a menu title and then select the command.

  For example, click **Detailing --> Bolts --> Create Bolts**.

- Click the right mouse button to open a pop-up menu, and then select a command. When you select an object, the commands on the pop-up menu relate to that object.

The command runs until you end it or use another command.

For more information on how to use each command, rest the mouse pointer on a command button. The corresponding enhanced tooltip appears on the screen.

See also  Repeating a command on page 28
3.2 Repeating a command

To repeat the last command, do one of the following:

• Click Edit --> Repeat Last Command.
• Press Enter.

See also Running a command on page 27

3.3 Ending a command

To cancel or end a command, do one of the following:

• Click Edit --> Interrupt.
• Right-click and select Interrupt from the pop-up menu.
• Press Esc.

See also Running a command on page 27
Undoing a command on page 28

3.4 Undoing a command

You can undo commands and actions that you have previously done in Tekla Structures. You can undo all actions since the last save in the current session. Creating or opening a drawing clears the undo log.

To undo a command, do one of the following:

• Click undo.
• Click Edit --> Undo.
• Press Ctrl + Z.

Limitations You cannot undo view commands.

See also Redoing a command on page 29
3.5 **Redoing a command**

You can redo commands and actions that were previously undone. Before you can redo anything, you must use the **Undo** command to reverse at least one action. You can redo all actions since the last **Redo** command or last save in the current session. Creating or opening a drawing clears the redo log.

To redo a command, do one of the following:

- Click ![Redo button](image)
- Click **Edit --> Redo**.
- Press **Ctrl + Y**.

**Limitations** You cannot redo view commands.

**See also** [Undoing a command on page 28](#)

3.6 **Keyboard shortcuts for common commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Keyboard shortcut</th>
</tr>
</thead>
<tbody>
<tr>
<td>Help</td>
<td>F1</td>
</tr>
<tr>
<td>Create new model</td>
<td>Ctrl+N</td>
</tr>
<tr>
<td>Open model</td>
<td>Ctrl+O</td>
</tr>
<tr>
<td>Save model</td>
<td>Ctrl+S</td>
</tr>
<tr>
<td>Delete</td>
<td>Del</td>
</tr>
<tr>
<td>Properties</td>
<td>Alt+Enter</td>
</tr>
<tr>
<td>Undo</td>
<td>Ctrl+Z</td>
</tr>
<tr>
<td>Redo</td>
<td>Ctrl+Y</td>
</tr>
<tr>
<td>Interrupt</td>
<td>Esc</td>
</tr>
<tr>
<td>Repeat last command</td>
<td>Enter</td>
</tr>
<tr>
<td>Show or hide Mini Toolbar</td>
<td>Ctrl+K</td>
</tr>
</tbody>
</table>

**See also** [Using commands on page 27](#)

Assigning a keyboard shortcut for a command on page 24
Creating and modifying objects

This section explains how to create and modify objects in Tekla Structures models and drawings.

Click the links below to find out more:

Creating an object on page 30
Modifying an object on page 31
Deleting an object on page 32
Direct modification on page 32

4.1 Creating an object

To create an object:

1. Open the object properties dialog box by doing one of the following:
   - Double-click an existing object.
   - Double-click a toolbar button.
   - Hold down Shift and select a menu command.
   - Click in the Mini Toolbar.

      For example, to display the beam properties, double-click , or hold down Shift and click Modeling --> Create Steel Part --> Beam .

2. If needed, modify the properties.
   If you do not modify the properties, Tekla Structures creates the object using the current properties of the object type.

3. Click Apply or OK.
4. Pick points to place the object in the model.

To create several objects with the same properties, pick multiple points. The command runs until you end it or use another command.

See also  Mini Toolbar on page 15
Using commands on page 27

4.2 Modifying an object

To modify an object:

1. Select the objects you want to modify.
2. Open the object properties dialog box by doing one of the following:
   • Double-click an existing object.
   • Double-click a toolbar button.
   • Hold down Shift and select a menu command.
   • Click in the Mini Toolbar.

   For example, to display the beam properties, double-click , or hold down Shift and click Modeling --> Create Steel Part --> Beam.

3. To indicate which properties should be changed, select or clear the desired check boxes.

   Click to switch all check boxes on or off.

4. Modify the properties.

5. Click Modify.

You can also modify some model objects by using the direct modification handles. If Direct Modification is on, just select an object to display its direct modification handles. Then select a handle to drag it to a new location.

See also  Mini Toolbar on page 15
Selecting objects on page 35
Direct modification on page 32
4.3 Deleting an object

To delete an object:
1. Select the object you want to delete.
2. Do one of the following:
   • Click Edit --> Delete .
   • Right-click and select Delete from the pop-up menu.
   • Press Delete.

See also Selecting objects on page 35

4.4 Direct modification

With direct modification you can easily modify certain model objects by simply dragging handles, without using the object properties dialog boxes.

When you select an object in a model view, Tekla Structures displays handles and dimensions that are specific for that model object.

Direct modification handles and dimensions are available for the following model object types:
• Parts
• Pour breaks
• Reinforcement
• Loads
• Grids and grid lines
• Construction objects (points, lines, circles, and planes)
• Custom components whose type is Part

By using the handles and dimensions you can, for example, change the shape of a part, uniform load, or reinforcement, or you can move a construction object, grid line, point load, or line load.

Handles
The direct modification handles are typically blue. For custom parts, handles are red, green, and blue according to the local coordinate system of the custom part. The handle shapes are as follows:
<table>
<thead>
<tr>
<th>Handle</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Reference point handle" /></td>
<td>Reference point handle</td>
</tr>
<tr>
<td><img src="image2" alt="Midpoint handle" /></td>
<td>Midpoint handle</td>
</tr>
<tr>
<td><img src="image3" alt="End point handle of reinforcing bars" /></td>
<td>End point handle of reinforcing bars</td>
</tr>
<tr>
<td><img src="image4" alt="Line handle" /></td>
<td>Line handle</td>
</tr>
<tr>
<td><img src="image5" alt="Plane handle" /></td>
<td>Plane handle</td>
</tr>
<tr>
<td><img src="image6" alt="Axis handle of custom parts" /></td>
<td>Axis handle of custom parts</td>
</tr>
<tr>
<td><img src="image7" alt="Rotation handle of custom parts" /></td>
<td>Rotation handle of custom parts</td>
</tr>
</tbody>
</table>

When you right-click a point handle, Tekla Structures displays a toolbar with more modification options. The available options depend on the type of the object you are modifying and on the type of the handle.
**Dimensions**
The colors of direct modification dimensions follow the colors of work plane coordinate axes. The dimensions are red in the x direction of the work plane, green in the y direction, and blue in the z direction. The diagonal dimensions are magenta.

You can change the direct modification dimensions by dragging the dimension arrowheads or by using the **Enter a Numeric Location** dialog box.

**Switching on or off**
To switch direct modification on or off, do one of the following:

- Click 
- Press Ctrl+D.
- Click **Tools --> Options --> Direct Modification**.
Selecting objects

You can select objects as a sequence of single selections and/or area selections. Tekla Structures highlights the selected objects. The number of selected objects and handles is displayed in the bottom right corner of the status bar. For example: 1 + 1 object(s) selected.

Also dimensions and dimension lines are displayed when you select a column or a beam in a model.

To show or hide the dimensions, use the advanced option.

See also

- Switching rollover highlight on or off on page 36
- Selection switches on page 37
- Selecting single objects on page 37
- Selecting multiple objects on page 38
5.1 Switching rollover highlight on or off

When you move the mouse pointer over objects in model views, Tekla Structures highlights the objects in yellow, so that you can easily see which objects you can select.

To switch rollover highlight on or off, do one of the following:

- Press H.
- Click Tools --> Options --> Rollover Highlight.

See also  Selecting objects on page 35
5.2 Selection switches

The selection switches are special commands that control which objects and object types you can select. For example, if only the Select welds switch is active, Tekla Structures only selects welds, even if you select the entire model area.

The main selection switches control whether you can select components and assemblies, or objects included in them. These switches have the highest priority:

![Selection switches](image1)

The other selection switches control which object types you can select:

![Selection switches](image2)

Similar selection switches are available in drawings:

![Selection switches](image3)

Click the selection switches to switch them on or off. For more information on how to use each switch, rest the mouse pointer on a switch button. The corresponding enhanced tooltip appears on the screen.

**See also** If you cannot select objects on page 97

5.3 Selecting single objects

To select a single object, do one of the following:

- To select an object, click it with the left mouse button.
- To select an object and open its pop-up menu, click the object with the right mouse button.

You can select objects with the right mouse button only if you have switched on the following options on the Tools --> Options menu:

- Select on Right-Click
- Rollover Highlight

**See also** Selecting multiple objects on page 38

Modifying the selection on page 41
5.4 Selecting multiple objects

You can select multiple objects simultaneously in models and in drawings. To select multiple objects (area selection), do one of the following:

- Hold down the mouse button and drag the mouse from **left to right** to select the objects that are completely within that rectangular area.

- Hold down the mouse button and drag the mouse from **right to left** to select the objects that are completely or partly within that rectangular area.

To define how area selection works, click **Tools --> Options --> Crossing Selection**.

When the option is **off**, the dragging direction affects the selection of objects, as described above. By default, the option is off.

When the option is **on**, all objects that fall at least partially inside the rectangular area are selected, regardless of the dragging direction.

See also  
- Selecting single objects on page 37
- Modifying the selection on page 41
- Interrupting object selection on page 98
5.5 Selecting handles

To select only the handles of a part:

1. Drag the mouse from left to right to select the part.

2. Hold down the Alt key and drag the mouse from left to right to select the part again.

5.6 Selecting assemblies and cast units

To select an assembly or cast unit:

1. Ensure that the Select assemblies selection switch is active.

2. Select a part. Tekla Structures selects the entire cast unit or assembly that contains the part.

See also
5.7 Selecting nested assemblies and components

The active selection switch defines on which level you start and toward which direction you move in the component or assembly hierarchy. The status bar shows the steps you take in the hierarchy.

To select nested assemblies or components:

1. Ensure that the correct selection switch is active.

   - If the **Select assemblies** switch is active, you can select objects in the assembly hierarchy, starting from the assemblies on the highest level, move to their sub-assemblies, and finally select single parts, bolts, and so on.

   - If the **Select objects in assemblies** switch is active, you start selecting from single objects and move to bigger and bigger nested assemblies.

2. Hold down the **Shift** key.

3. Scroll with the mouse wheel.

   An orange box indicates the assembly or component that you can select.

See also

5.8 Selecting a reference model

To select a reference model:

1. Activate the **Select reference models** switch.
2. Activate the Select components switch.
3. Select the reference model.

See also
- Selecting a reference model object on page 41
- Selecting a reference model assembly on page 41

5.9 Selecting a reference model object

To select a reference model object:

1. Activate the Select reference models switch.
2. Activate the Select objects in components switch.
3. Select the desired object in the reference model.

See also
- Selecting a reference model on page 40
- Selecting a reference model assembly on page 41

5.10 Selecting a reference model assembly

To select a reference model assembly:

1. Activate the Select reference models switch.
2. Activate the Select assemblies switch.
3. Select the desired assembly in the reference model.

See also
- Selecting a reference model object on page 41
- Selecting a reference model on page 40
5.11 Modifying the selection

To modify the current selection, do any of the following:

<table>
<thead>
<tr>
<th>To</th>
<th>Do this</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add objects to the current selection</td>
<td>Press the <strong>Shift</strong> key and select the objects.</td>
</tr>
<tr>
<td>Switch the selection of an object on or off</td>
<td>Press the <strong>Ctrl</strong> key during the selection. Tekla Structures deselects the objects that were already selected and selects those that were previously not selected.</td>
</tr>
</tbody>
</table>

See also Selecting objects on page 35

5.12 Keyboard shortcuts for selecting objects

<table>
<thead>
<tr>
<th>Command</th>
<th>Keyboard shortcut</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rollover highlight</td>
<td>H</td>
</tr>
<tr>
<td>Select all selection switch</td>
<td>F2</td>
</tr>
<tr>
<td>Select parts selection switch</td>
<td>F3</td>
</tr>
<tr>
<td>Add to selection</td>
<td>Shift</td>
</tr>
<tr>
<td>Toggle selection</td>
<td>Ctrl</td>
</tr>
<tr>
<td>Select all</td>
<td>Ctrl+A</td>
</tr>
<tr>
<td>Select assembly</td>
<td>Alt+object</td>
</tr>
<tr>
<td>Hide object</td>
<td>Shift+H</td>
</tr>
<tr>
<td>Lock X, Y or Z coordinates</td>
<td>X, Y or Z</td>
</tr>
<tr>
<td>Selection filter</td>
<td>Ctrl+G</td>
</tr>
</tbody>
</table>

See also Selecting objects on page 35

Assigning a keyboard shortcut for a command on page 24
The basic functionality of copying and moving objects is the same in models and in drawings. You can copy and move objects linearly, with rotation, and with mirroring.

If you copy or move objects from an assembly or cast unit, Tekla Structures copies the assembly structure if possible. For example, sub-assemblies are copied as sub-assemblies if a parent object is found.

If you copy or move reinforcements or surface treatments and want them to adapt to the part they are copied or moved to:

- The reinforcement or surface treatment handles must be in part corners.
- The parts between which you copy or move must have the same number of cross section corners.
- Circular parts must have the same cross section dimensions.

You can copy and move drawing objects between drawing views that have different scales.

See also
- Duplicate objects on page 43
- Copying an object on page 44
- Moving an object on page 55
- Rotating objects on page 59
- Mirroring an object on page 63
- Copying and moving efficiently on page 97
- Keyboard shortcuts for copying and moving objects on page 64
6.1 Duplicate objects

When you copy or move objects, Tekla Structures checks for duplicate objects in the location where you are about to copy or move the objects to. Tekla Structures also checks for duplicates if you create new parts in the same location as an existing part.

Two objects are considered duplicates if they have the same orientation and the same size of bounding box. If duplicates are found, you can choose whether to keep or delete the duplicate objects.

Use the advanced option to define the maximum number of objects that can be counted as duplicates while copying or moving objects.

Limitations Tekla Structures does not check for duplicates when you copy objects using a modeling tool, such as the Array of Objects (29) component.

See also Copying and moving objects on page 43

6.2 Copying an object

When you copy an object, Tekla Structures also copies all the objects that are connected to it. Tekla Structures also tries to copy connections. The connections must be surrounded by similar parts to be copied successfully.

To copy an object:

1. Select the object you want to copy.

2. Do one of the following:
   - In the model, click Edit --> Copy.
   - In the drawing, click Edit --> Copy --> Linear.

3. Pick the origin for copying.
4. Pick one or more destination points.

The objects are copied immediately. The Copy command remains active.

5. If you want to undo the latest copy operation, click Edit > Undo.

The Copy command still remains active.

6. To stop copying, click Edit --> Interrupt.
Copying an object by specifying distance from origin

You can place objects in a new position in the model or drawing by specifying a distance from the origin. Use the **Enter a Numeric Location** dialog box to specify the distance.

To copy an object by specifying distance from origin:

1. Select the objects you want to copy.
2. Click **Edit > Copy**.
3. Pick the origin for copying.
4. Move the cursor in the direction you want to copy the objects, but do not pick the point.
5. Type the distance.

   When you start typing, Tekla Structures displays the **Enter a Numeric Location** dialog box automatically.

6. Click **OK**.

**See also**
- Copying an object on page 44
- Snapping to a position using coordinates on page 75

Copying an object linearly to a new position

Use the **Copy Special > Linear...** command in a model to create multiple copies of an object in the same linear direction.

To copy an object linearly to a new position:

1. Select the objects you want to copy.
2. Click Edit > Copy Special > Linear...

3. Pick two points in the model, or enter the coordinates in the $dX$, $dY$, and $dZ$ boxes. You can also use a formula to calculate the x, y, and z displacements. For example:

\[
\begin{array}{c}
\text{\textbf{dY}} \\
-3.1350
\end{array}
\]

4. Enter the number of copies.
5. Click Copy.
6. To stop copying, click Edit --> Interrupt.

If the dialog box is open but the command is not active anymore, click the Pick button to re-activate the command.

See also  Copying an object on page 44

### Copying an object using drag-and-drop

To copy an object using drag-and-drop:

1. Click Tools --> Options --> Drag and Drop to activate the command.
2. Select the objects you want to copy.
3. Hold down the Ctrl key and the mouse button, and drag the objects to the new position.

To copy grid labels in a drawing, first select the grid label and then either activate the Select grid line selection switch or select the grid label handle.

See also  Copying an object on page 44

### Copying an object to another plane

In a model, you can copy objects from the first plane you specify to the second (and third, etc.) plane you specify. The position of the copied objects relative to the second (and third, etc.) plane remains the same as the position of the original objects relative to the first plane.

To copy an object to another plane:

1. Select the objects you want to copy.
2. Click Edit --> Copy Special --> To Another Plane.
3. Pick the point of origin of the first plane.
4. Pick a point on the first plane in the positive x direction.
5. Pick a point on the first plane in the positive y direction.
6. Repeat steps 3–5 for all destination planes.

See also  Copying an object on page 44

Copying an object to another object

In a model, you can copy objects from an object to other similar objects. This is useful, for example, when you detail previously modeled parts. The objects that you can copy between can have different dimensions, length, and rotation.

To copy an object to another object:
1. Select the objects you want to copy.
2. Right-click and select Copy Special > To Another Object.
3. Select the object to copy from (source object).
4. Select the objects to copy to (target object).

See also  Copying an object on page 44

Copying all content to another object

In a model, you can copy objects from an assembly or cast unit to other similar assemblies or cast units without individually selecting each object to copy. This is useful, for example, when you have detailed an assembly and want to copy all details to another similar assembly.

When you use the Copy Special --> All Content to Another Object command, Tekla Structures copies the following objects:

- Secondary parts
- Reinforcement, bolts, and welds
- Cuts, fittings, and edge chamfers
- Sub-assemblies
- Components

Tekla Structures does not copy pour breaks, or secondary parts created by a component that has also created the assembly main part.

If some of the objects to be copied already exist in the assembly or cast unit to copy to, Tekla Structures may create duplicate objects. Tekla Structures warns you
about duplicate secondary parts, reinforcement, and sub-assemblies, but not about
duplicate bolts, welds, cuts, or components.

To copy objects from an assembly or a cast unit to another assembly or cast unit:

1. Ensure that the **Select assemblies** selection switch is active.
2. Select the assembly or cast unit to copy from (source object).
3. Right-click and select **Copy Special --> All Content to Another Object** from the pop-up menu.
4. Select the assemblies or cast units to copy to (target objects).

See also  Copying an object on page 44

**Copying objects from another model**

To copy objects from another model:

1. Click **Edit > Copy Special --> From Another Model...**
2. Select the model to copy from in the **Model directories** list.
3. Enter the numbers of the phases from which to copy objects, separated by spaces.
   For example, 2 7.
4. Click **Copy**.
5. Close the dialog box.

**Limitations**  You cannot import drawings with the model.

Tekla Structures only copies secondary parts from the model if they belong to the same phase as their main part. This applies to both model and component parts.

See also  Copying an object on page 44

**Copying objects using linear array tool**

Use the **Linear array tool** modeling tool to copy selected objects along multiple directions at defined intervals or spacing.

To use the **Linear array tool**:

1. In the model, use the keyboard shortcut **Ctrl+F** to open the component catalog.
2. Double-click **Linear array tool** to open the **Linear array tool** dialog box. Use **Search**, if you cannot see **Linear array tool** on the list.

3. Select the **Copy method**. The options are:
   - **Selected objects only**
     This is the default. Only the selected objects are copied.
   - **All associated objects**
     Selected objects and all objects associated with them are copied. For example, cuts and fittings applied to a part.
   - **Advanced**
     This option is similar to **All associated objects**, but works better with modifications. For example, when you have stairs that have handrails welded to the steps, and you modify the distance between steps.

4. Select the **Copy origin**. The options are:
   - **Objects to be copied**
     This is the default. Copies are relative to the input objects.
   - **Origin point**
     Copies are relative to the input origin point.

5. Define the settings.

6. Select the objects to copy.

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

8. Click the middle mouse button.


10. Pick axis direction X.

11. Pick axis direction Y.

The selected objects are copied.

**See also**  
- Linear array tool settings on page 50  
- Copying objects using radial array tool on page 52
**Linear array tool settings**

1. Offset along the Y axis. The default value is 0 mm.
2. Offset along the Z axis. The default value is 0 mm.
3. Number of copies. The default value is 0.
4. Space between copies. The default value is 0 mm.
   Use the space character to separate values. Enter a value for each space between copies.
   This option is not available if you select *Equal* as the spacing method.
5. Copy direction. The options are:
   - **Normal** (default)
     Spacing values are calculated from the origin in positive direction along the axis.
   - **Reverse**
     Spacing values are calculated from the origin in negative direction along the axis.
   - **Centered**
     Copies are centered on the origin.
   - **Mirror**
     Spacing values are calculated from the origin in both positive and negative direction. Mirrored copying doubles the number of copies.
6. Spacing method. The options are:
   - **Equal** (default)
     Copies are equally spaced based on the length of the X or Y axis.
Specified
Copies are spaced according to the number and spacing values given.

See also
- Copying objects using linear array tool on page 49
- Copying objects using radial array tool on page 52

Copying objects using radial array tool

Use the Radial array tool modeling tool to copy selected objects along multiple directions at defined intervals or spacing.

To use the Radial array tool:
1. In the model, use the keyboard shortcut Ctrl+F to open the component catalog.
2. Double-click Radial array tool to open the Radial array tool dialog box.
   Use Search, if you cannot see Radial array tool on the list.
3. Select the Copy method. The options are:
   - **Selected objects only**
     This is the default. Only the selected objects are copied.
   - **All associated objects**
     Selected objects and all objects associated with them are copied. For example, cuts, welds, and bolts.
   - **Advanced**
     This option is similar to All associated objects, but works better with modifications. For example, when you have stairs that have handrails welded to the steps, and you modify the distance between steps.
4. Select the Rotate copies option.
   The default is Yes.
5. Define the rotation axis.
   The default is X.
6. Define the settings.
7. Select the objects to copy.
8. Click OK to close the dialog box.
9. Click the middle mouse button.
10. Pick origin point.
11. Pick axis direction X.
12. Pick axis direction Y.
The selected objects are copied.

See also  
Radial array tool settings on page 53
Copying objects using linear array tool on page 49

Radial array tool settings

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Distance between copies. The default value is 0.

2. Rotation. The options are:
   - **Angle** (default)
     - The copies are rotated by angle.
   - **Distance**
     - The copies are rotated by distance.

3. Number of angles or distances. The default value is 0.

4. Space between copies.
   - Use the space character to separate values. Enter a value for each space between copies.

5. Copy direction. The options are:
   - **Normal** (default)
     - Spacing values are calculated from the origin in positive direction along the axis.
• **Reverse**
  Spacing values are calculated from the origin in negative direction along the axis.

• **Centered**
  Copies are centered on the origin.

• **Mirror**
  Spacing values are calculated from the origin in both positive and negative direction. Mirrored copying doubles the number of copies.

<table>
<thead>
<tr>
<th></th>
<th>Angle between copies. The default value is 0. You can define the angle only when you select <strong>Distance</strong> as the <strong>Rotation</strong> option.</th>
</tr>
</thead>
</table>

**See also**
Copying objects using radial array tool on page 52
Copying objects using linear array tool on page 49

**Copying objects using Array of objects (29) component**

Use the **Array of objects (29)** component to copy model objects along a line. If you modify the original object, Tekla Structures also changes the copied objects.

<table>
<thead>
<tr>
<th>Parts created</th>
<th>Copies of the selected model objects.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Where to use</th>
<th>Situation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Diagram" /></td>
<td>An array of parts.</td>
<td></td>
</tr>
</tbody>
</table>
### Situation Description

An array of components.

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of copies</td>
<td>The number of copies created.</td>
</tr>
<tr>
<td>Spacing values</td>
<td>Define the spacing of the objects.</td>
</tr>
<tr>
<td>Copy to the opposite direction</td>
<td></td>
</tr>
<tr>
<td>Start point for copying</td>
<td>Choose either the object to be copied or the first input point.</td>
</tr>
<tr>
<td>Copy at equal distances</td>
<td>To create the objects at equal distances.</td>
</tr>
<tr>
<td></td>
<td><strong>Spacing value</strong> will be ignored.</td>
</tr>
</tbody>
</table>

### Before you start

Create the parts you want to copy.

### Defining properties

Use the **Array of objects (29)** dialog box to define the following properties:

1. Select the objects to copy.
2. Click the middle mouse button to finish selecting.
3. Pick a point to indicate the start of the line along which to arrange copied objects.
4. Pick a point to indicated the end of the line.

### Selection order

1. Select the object you want to move.
2. Click the middle mouse button to finish selecting.
3. Pick a point to indicate the start of the line along which to arrange copied objects.
4. Pick a point to indicated the end of the line.

### 6.3 Moving an object

When you move an object, Tekla Structures also moves the objects that are connected to it. For example, if you move points, Tekla Structures also moves the parts or assemblies that use those points.

To move an object:
1. Select the object you want to move.
2. Do one of the following:
   - In a model, click **Edit --> Move**.
   - In a drawing, click **Edit --> Move --> Linear**.

3. Pick the origin for moving.

4. Pick a destination point.

The object is moved immediately. The **Move** command does not remain active.

**See also**  
Copying and moving efficiently on page 97  
Moving an object by specifying distance from origin on page 57
Moving an object by specifying distance from origin

You can place objects in a new position in the model or drawing by specifying a distance from the origin. Use the Enter a Numeric Location dialog box to specify the distance.

To move an object to a new position by specifying the distance:
1. Select the objects you want to move.
2. Click Edit > Move.
3. Pick the origin for moving.
4. Move the cursor in the direction you want to move the objects, but do not pick the point.
5. Type the distance.
   When you start typing, Tekla Structures displays the Enter a Numeric Location dialog box automatically.
6. Click OK.

Moving an object linearly to a new position

To move an object linearly to a new position in a model:
1. Select the objects you want to move.
2. Click Edit > Move Special > Linear....
3. Pick two points in the model, or enter the coordinates in the dX, dY, and dZ boxes.
   You can also use a formula to calculate the x, y, and z displacements. For example:

\[
\begin{array}{c|c}
    \text{dY} & -3.1250 \\
\end{array}
\]
4. Click Move.
If the dialog box is open but the command is not active anymore, click the Pick button to re-activate the command.

**See also**  
Moving an object on page 55

### Moving an object using drag-and-drop

To move an object using drag-and-drop:

1. Click **Tools** --> **Options** --> **Drag and Drop** to activate the command.
2. Select the objects you want to move.
3. Do one of the following:
   - To move the objects, hold down the mouse button and drag the objects to the new position.
   - To move the end of an object, select the handle, hold down the mouse button, and drag the handle to the new position.

For some objects, you need to switch both **Smart Select** and **Drag and Drop** on to drag from handles without selecting them first.

To switch **Smart Select** on, click **Tools** --> **Options** --> **Smart Select**.

To move grid labels in a drawing, first select the grid label and then either activate the **Select grid line** selection switch or select the grid label handle.

**See also**  
Moving an object on page 55

### Moving an object to another plane

In a model, you can move objects from the first plane you specify to another plane, which you specify by picking three points. The moved objects remain in the same position on the second plane as the original objects on the first plane.

To move an object to another plane:

1. Select the objects you want to move.
2. Click **Edit** --> **Move Special** --> **To Another Plane**.
3. Pick the point of origin of the first plane.
4. Pick a point on the first plane in the positive x direction.
5. Pick a point on the first plane in the positive y direction.
6. Repeat steps 3–5 for the destination plane.

See also Moving an object on page 55

**Moving an object to another object**

In a model, you can move objects from an object to other, similar objects. This is useful, for example, when you detail previously modeled parts. The objects that you move between can have different dimensions, length, and rotation.

To move an object to another object:

1. Select the objects you want to move.
2. Right-click and select **Move Special > To Another Object** from the pop-up menu.
3. Select the object to move from (source object).
4. Select the objects to move to (target object).

See also Moving an object on page 55

### 6.4 Rotating objects

You can copy or move an object in a model by rotating it around any line you choose. In a drawing, you can copy or move an object by rotating it around a given line on the work plane.

Click the links below to find out more:

- Rotating an object around a line on page 59
- Rotating an object around the z axis on page 61
- Rotating drawing objects on the work plane on page 63

Positive rotation is according to the right-hand rule (clockwise when looking from the start point of the rotation axis). For more information, see .
Rotating an object around a line

Use the line option when you want to copy and rotate, or move and rotate objects around any given line in the model.

To rotate an object around a line:
1. Select the objects you want to copy or move.
2. Activate the rotation command.
   - To copy and rotate the objects, click Edit --> Copy Special --> Rotate...
   - To move and rotate the objects, click Edit --> Move Special --> Rotate...
3. Select line in the Around list.
4. Pick the start point of the rotation axis, or enter its coordinates.
5. Pick the end point of the rotation axis, or enter its coordinates.
6. If you are copying, enter the number of copies.
7. If needed, enter the dZ value, which is the difference in position between the original and copied object in the z direction.
8. Enter the rotation angle.
9. Click Copy or Move.

   The objects are rotated accordingly.

Example

In this example, a fitting plate is copied and rotated around a construction line that is located at the following coordinates.

<table>
<thead>
<tr>
<th>Origin</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>X0</td>
<td>19000.00</td>
</tr>
<tr>
<td>Y0</td>
<td>23047.50</td>
</tr>
<tr>
<td>Z0</td>
<td>-900.00</td>
</tr>
<tr>
<td>X1</td>
<td>18000.00</td>
</tr>
<tr>
<td>Y1</td>
<td>24000.00</td>
</tr>
<tr>
<td>Z1</td>
<td>-900.00</td>
</tr>
</tbody>
</table>

As a result, the copied fitting plates follow the curve of the concrete panel.
Rotating an object around the z axis

Use the Z option when you want to copy and rotate, or move and rotate objects around the z axis in the model.

To rotate an object around the z axis:

1. Select the objects you want to copy or move. For example:

2. Activate the rotation command.
• To copy and rotate the objects, click Edit --> Copy Special --> Rotate...
• To move and rotate the objects, click Edit --> Move Special --> Rotate...

3. Select Z in the Around list.

4. Pick a point to define the rotation axis, or enter its coordinates.
   In the example below, the red cross indicates the picked point.

5. If you are copying, enter the number of copies.

6. If needed, enter the dZ value, which is the difference in position between the original and copied object in the z direction.

7. Enter the rotation angle. For example:

<table>
<thead>
<tr>
<th>Copy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of copies 3</td>
</tr>
<tr>
<td>dZ 0.00</td>
</tr>
<tr>
<td>Rotation</td>
</tr>
<tr>
<td>Angle 45.0000</td>
</tr>
<tr>
<td>Around Z</td>
</tr>
</tbody>
</table>

8. Click Copy or Move.
   The objects are rotated accordingly.

See also Rotating an object around a line on page 59
Rotating drawing objects on the work plane

To rotate a drawing object around a line on the work plane:

1. Select the objects you want to copy or move.
2. Activate the rotation command:
   • To copy and rotate the drawing object, click Edit --> Copy --> Rotate...
   • To move and rotate the drawing object click Edit --> Move --> Rotate...
3. Pick a point, or enter its coordinates.
4. If you are copying, enter the number of copies.
5. Enter the rotation angle.
6. Click Copy or Move.

See also Rotating objects on page 59

6.5 Mirroring an object

When you copy or move an object, you can mirror it through a plane that is perpendicular to the work plane and passes through a line you specify.

Note that Tekla Structures cannot create mirrored copies of connection properties. The Copy Special > Mirror... command does not fully mirror objects if they include connections that contain, for example, asymmetrically positioned parts.

To mirror an object:

<table>
<thead>
<tr>
<th>To</th>
<th>Do this</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mirror in the model</td>
<td>1. Select the objects you want to copy or move.</td>
</tr>
<tr>
<td></td>
<td>2. Activate the mirroring command:</td>
</tr>
<tr>
<td></td>
<td>• To copy and mirror the objects, click Edit --&gt; Copy Special --&gt; Mirror...</td>
</tr>
<tr>
<td></td>
<td>• To move and mirror the objects, click Edit --&gt; Move Special --&gt; Mirror...</td>
</tr>
<tr>
<td></td>
<td>3. Pick the start point of the mirroring plane, or enter its coordinates.</td>
</tr>
<tr>
<td></td>
<td>4. Pick the end point of the mirroring plane, or enter its coordinates.</td>
</tr>
<tr>
<td></td>
<td>5. Enter the angle.</td>
</tr>
</tbody>
</table>
To Do this
---
6. Click **Copy** or **Move**.

<table>
<thead>
<tr>
<th>Mirror in the drawing</th>
<th>1. Select the objects you want to copy or move.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Activate the mirroring command:</td>
</tr>
<tr>
<td></td>
<td>• To copy and mirror the objects, click <strong>Edit --&gt; Copy --&gt; Mirror</strong>...</td>
</tr>
<tr>
<td></td>
<td>• To move and mirror the objects, click <strong>Edit --&gt; Move --&gt; Mirror</strong>...</td>
</tr>
<tr>
<td></td>
<td>3. Pick the start point of the mirroring plane, or enter its coordinates.</td>
</tr>
<tr>
<td></td>
<td>4. Pick the end point of the mirroring plane, or enter its coordinates.</td>
</tr>
<tr>
<td></td>
<td>5. Enter the angle.</td>
</tr>
<tr>
<td></td>
<td>6. Click <strong>Copy</strong> or <strong>Move</strong>.</td>
</tr>
</tbody>
</table>

See also  Copying and moving objects on page 43

### 6.6 Keyboard shortcuts for copying and moving objects

<table>
<thead>
<tr>
<th>Command</th>
<th>Keyboard shortcut</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copy</td>
<td>Ctrl+C</td>
</tr>
<tr>
<td>Move</td>
<td>Ctrl+M</td>
</tr>
<tr>
<td>Smart Select</td>
<td>S</td>
</tr>
<tr>
<td>Drag and drop</td>
<td>D</td>
</tr>
</tbody>
</table>

See also  Copying and moving objects on page 43
Assigning a keyboard shortcut for a command on page 24
Most Tekla Structures commands ask you to pick points to position objects. Snap priority, snap switches, and snap depth all affect picking.

When you move the mouse pointer over objects, Tekla Structures displays snap symbols for the available snap points. Tekla Structures also displays snap dimensions in the model, which means you can easily create objects of a desired length.

To show or hide the dimensions, use the advanced option XS_DISPLAY_DIMENSIONS_WHEN_CREATING_OBJECTS.
7.1 Snap zone

Each object has a snap zone. It defines how close you need to pick to hit a position. When you pick within the snap zone of an object, Tekla Structures automatically snaps to the closest pickable point on that object.

You can set the snap zone using the advanced option.

See also Snapping to positions on page 65

7.2 Snap depth

The first list on the Snapping toolbar defines the depth of each position you pick. The following options are available:

- Plane
  You can snap to positions either on the view plane or the work plane, depending on what you have selected in the second list on the Snapping toolbar.

- 3D
  You can snap to positions in the entire 3D space.

- Auto
  In perspective views, this option works like the 3D option. In non-perspective views, it works like the Plane option.

See also Snapping to positions on page 65
7.3 Snap switches

Use the snap switches to control which positions you can pick in the model or drawing. For example, you can snap to end points, midpoints, and intersections of existing objects. By using snap switches, you can position objects precisely without having to know the coordinates. You can use snap switches any time Tekla Structures prompts you to pick a point.

If you pick several positions simultaneously, Tekla Structures snaps to the position with the highest snap priority. If there is more than one point available to snap to, press the Tab key to cycle forward through the snap points, and Shift+Tab to cycle backwards through them. Click the left mouse button to select the appropriate point.

Click the snap switches on the Snapping toolbar to switch them on or off. For more information on how to use each switch, rest the mouse pointer on a switch button. The corresponding enhanced tooltip appears on the screen.

See also  Main snap switches on page 67  
Other snap switches on page 68  
Overriding the current snap switch on page 69  
Keyboard shortcuts for snapping on page 82

Main snap switches

The two main snap switches illustrated in the following table define whether you can snap to reference points or any other points on objects, for example part corners. These switches have the highest priority. If both these switches are off, you cannot snap to any positions, even if all the other switches are on.

<table>
<thead>
<tr>
<th>Button</th>
<th>Snap positions</th>
<th>Description</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Reference lines and points" /></td>
<td>Reference lines and points</td>
<td>You can snap to object reference points (points that have handles).</td>
<td><img src="image" alt="Symbol" /></td>
</tr>
</tbody>
</table>

See also  Main snap switches on page 67  
Other snap switches on page 68  
Overriding the current snap switch on page 69  
Keyboard shortcuts for snapping on page 82
<table>
<thead>
<tr>
<th>Button</th>
<th>Snap positions</th>
<th>Description</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Geometry lines and points" /></td>
<td>Geometry lines and points</td>
<td>You can snap to any points on objects.</td>
<td><img src="image" alt="Small symbol" /></td>
</tr>
</tbody>
</table>

**See also**  Other snap switches on page 68

### Other snap switches

The table below lists the remaining snap switches and their symbols. You can have Tekla Structures display the snap symbols in the model or drawing when you move the mouse pointer over objects. The snap symbol is yellow for model objects and objects in drawings, and green for objects inside components.

Make sure that you do not have too many snap switches on when snapping. Having too many snap switches on may easily lead to inaccuracies and errors in snapping. Be particularly careful when you use the **Free** snap switch.

<table>
<thead>
<tr>
<th>Button</th>
<th>Snap positions</th>
<th>Description</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Points" /></td>
<td>Points</td>
<td>Snaps to points and grid line intersections.</td>
<td><img src="image" alt="Points symbol" /></td>
</tr>
<tr>
<td><img src="image" alt="End points" /></td>
<td>End points</td>
<td>Snaps to end points of lines, polyline segments, and arcs.</td>
<td><img src="image" alt="End points symbol" /></td>
</tr>
<tr>
<td><img src="image" alt="Centers" /></td>
<td>Centers</td>
<td>Snaps to centers of circles and arcs.</td>
<td><img src="image" alt="Centers symbol" /></td>
</tr>
<tr>
<td><img src="image" alt="Midpoints" /></td>
<td>Midpoints</td>
<td>Snaps to midpoints of lines, polyline segments, and arcs.</td>
<td><img src="image" alt="Midpoints symbol" /></td>
</tr>
<tr>
<td><img src="image" alt="Intersections" /></td>
<td>Intersections</td>
<td>Snaps to intersections of lines, polyline segments, arcs, and circles.</td>
<td><img src="image" alt="Intersections symbol" /></td>
</tr>
<tr>
<td><img src="image" alt="Perpendicular" /></td>
<td>Perpendicular</td>
<td>Snaps to points on objects that form a perpendicular alignment with another object.</td>
<td><img src="image" alt="Perpendicular symbol" /></td>
</tr>
<tr>
<td><img src="image" alt="Line extensions" /></td>
<td>Line extensions</td>
<td>Snaps to the line extensions of nearby objects, and reference and geometry lines of drawing objects.</td>
<td><img src="image" alt="Line extensions symbol" /></td>
</tr>
<tr>
<td><img src="image" alt="Free" /></td>
<td>Free</td>
<td>Snaps to any position.</td>
<td><img src="image" alt="Free symbol" /></td>
</tr>
<tr>
<td>Button</td>
<td>Snap positions</td>
<td>Description</td>
<td>Symbol</td>
</tr>
<tr>
<td>--------</td>
<td>----------------</td>
<td>-------------</td>
<td>--------</td>
</tr>
<tr>
<td>❌</td>
<td>Nearest point</td>
<td>Snaps to the nearest points on objects, e.g. any point on part edges or lines.</td>
<td><img src="image" alt="Symbol" /></td>
</tr>
<tr>
<td>➤</td>
<td>Lines</td>
<td>Snaps to grid lines, reference lines, and the edges of existing objects.</td>
<td><img src="image" alt="Symbol" /></td>
</tr>
</tbody>
</table>

To show or hide the snap symbols, click **Tools --> Options --> Options... --> Mouse settings**, and select or clear the **Display snap symbol** check box.

See also  
- Main snap switches on page 67  
- Overriding the current snap switch on page 69

### Overriding the current snap switch

To temporarily override the current snap switch settings, do one of the following:

- Right-click and select the appropriate snap option from the pop-up menu.
- Click a button on the **Snap Override** toolbar.

To show or hide the **Snap Override** toolbar, click **Tools --> Toolbars --> Snap Override**.

See also  
- Snap switches on page 66

### 7.4 Snapping in orthogonal directions

When you use the **Ortho** tool for snapping in a model or in a drawing, the mouse pointer locks to the closest orthogonal point on the plane (0, 45, 90, 135, 180 degrees, and so on). The mouse pointer automatically snaps to positions at even distances in the given direction. The snapping precision depends on the current zoom level.

To snap to a position in an orthogonal direction:

1. Press **O** or click **Tools --> Ortho** to activate orthogonal snapping.
2. Initiate a command that requires you to pick positions. For example, create a beam.
Tekla Structures displays an angle symbol to indicate the direction of snapping.

![Diagram showing angle symbol for snapping](image)

In drawings, orthogonal snapping is handy when you want to place marks in a consistent manner in exact locations.

**See also**  
Snapping relative to previously picked points on page 70  
Creating a temporary reference point on page 74

**Snapping relative to previously picked points**

When picking multiple points, for example when you create a polybeam or a contour plate, you can snap in orthogonal directions relative to the two previously picked points. This is useful, for example, when you want to create a rectangular slab that is on the view plane but not along the x and y axes.

The color of the line and angle symbol changes to indicate that the snap is orthogonal to the previous points and not the work plane:

<table>
<thead>
<tr>
<th>Orthogonal to the work plane</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Diagram showing orthogonal snapping" /></td>
</tr>
</tbody>
</table>

See also Snapping to positions on page 70  
Snapping in orthogonal directions
Orthogonal to the two previously picked points

7.5 Snapping to a line

Use the Snap to line snap switch when modeling objects that should be lined up with an existing object or a grid line.

To snap to a line:

1. Ensure that the Snap to line snap switch is active.
2. Initiate a command that requires you to pick two or more points. For example, create a beam.

   Tekla Structures automatically picks both ends of the line. The yellow arrow symbol indicates the direction of the points.

   If you use the snap switch with a command that requires only one point to be picked, for example when creating a column, only the start point of the line is used to position the part.

3. To switch direction, move the mouse pointer closer to the opposite end of the line.

See also Snapping in orthogonal directions on page 69
Snapping to extension lines

You can snap to the extension lines of nearby objects. This can be useful, for example, when you want to align objects with one another.

To snap to the extension line of another object:

1. Ensure that the correct snap switches are active:

   - Switch on: **Snap to extension lines**
   - Switch on one of the following if you are snapping to the intersection of an extension line and a grid line: **Snap to nearest points** or **Snap to intersection points**
   - Switch off if you are working in 3D: **Snap to end points**

See also Snapping to positions on page 65
2. Initiate a command that requires you to pick positions. For example, create a beam.
Tekla Structures displays line extensions in blue color.

3. Move the mouse pointer close to the object to find the extension line.
When the line is found, you can move the pointer further away while keeping the snap.

In drawings, Tekla Structures snaps to extensions of reference and geometry lines of drawing objects. The reference and geometry lines are shown in blue when the mouse pointer locks to them.

**Example**

**In the model:**

![Diagram of a beam with snapping to extension lines](image1)

**In the drawing:**

![Diagram of a beam in a 3D model](image2)
7.7 Creating a temporary reference point

You can create a temporary reference point to use as a local origin when snapping in models or drawings. Temporary reference points can be used in combination with other snapping tools, such as snap switches and orthogonal snapping.

To create a temporary reference point:
1. Initiate a command that requires you to pick positions. For example, create a beam.
2. Pick the start point.
3. Hold down the Ctrl key and pick a position.
   A green cross indicates that this position is now a temporary reference point.
4. Repeat step 3 to create as many reference points as needed.
5. Release the **Ctrl** key and pick the end point.

Tekla Structures creates the object between the start point and the end point.

---

### 7.8 Locking a coordinate

You can lock the x, y, and z coordinates on a line. This is useful when you need to determine a point to pick and the needed point does not exist on the line. When a coordinate is locked, you can snap to points only in that direction.

To lock the pointer in the x direction:

1. Initiate a command that requires you to pick positions. For example, create a beam.
2. To lock the x coordinate, press **X**. You can snap to points only in the x direction.
3. To unlock the coordinate, press **X** again.

---

### 7.9 Snapping to a position using coordinates

You can use coordinates when snapping to a position. Use the **Enter a Numeric Location** dialog box to specify the coordinates.

To snap to a position using coordinates:

1. Initiate a command that requires you to pick positions. For example, create a beam.
2. Do one of the following:
   
   - **Click** **Tools** --> **Enter a Numeric Location** and select an option.
   - Start entering the coordinates using the keyboard.

When you start typing, Tekla Structures displays the **Enter a Numeric Location** dialog box automatically.
3. After entering the coordinates, press **Enter** or click **OK** to snap to the position.

See also
- Options for entering coordinates on page 77
- Copying an object by specifying distance from origin on page 46
- Moving an object by specifying distance from origin on page 57

### Tracking

Tracking means that you follow a line and pick a point at a specified distance along the line. You usually use tracking in combination with numeric coordinates and other snapping tools, such as snap switches and orthogonal snapping.

When you have snap switches on and you use a command that requires you to pick positions, the mouse pointer locks onto a snap point. Tekla Structures displays a green line between the last point picked and the snap point.

You can track along the line towards a snap point, and use the **Enter a Numeric Location** dialog box to specify the distance from the last point picked.

**Tracking along a line**  In the illustration below, we snapped to a grid line midpoint and tracked along the tentative line for 1000 units when creating a beam.
Tracking beyond the snap point
You can also track beyond the snap point, for example, 4000 units from the last point picked.

Tracking in the opposite direction
Track in the opposite direction by entering a negative value, for example, -1000.

See also
Snapping to a position using coordinates on page 75
Options for entering coordinates

The table below explains the types of information you can enter in the **Enter a Numeric Location** dialog box.

Tekla Structures has three snapping modes, relative, absolute, and global. Use the advanced option `XS_KEYIN_DEFAULT_MODE` to indicate the default snapping mode.

<table>
<thead>
<tr>
<th>You can enter</th>
<th>Description</th>
<th>Special character</th>
</tr>
</thead>
<tbody>
<tr>
<td>One coordinate</td>
<td>A distance to an indicated direction.</td>
<td></td>
</tr>
<tr>
<td>Two coordinates</td>
<td>If you omit the last coordinate (z) or angle, Tekla Structures assumes that the value is 0.</td>
<td></td>
</tr>
<tr>
<td>Three coordinates</td>
<td>In drawings, Tekla Structures ignores the third coordinate.</td>
<td></td>
</tr>
<tr>
<td>Cartesian coordinates</td>
<td>The x, y, and z coordinates of a position separated by commas.</td>
<td>, (comma)</td>
</tr>
<tr>
<td></td>
<td>For example, 100, -50, -200.</td>
<td></td>
</tr>
<tr>
<td>Polar coordinates</td>
<td>A distance, an angle on the xy plane, and an angle from the xy plane separated by angle brackets.</td>
<td>&lt;</td>
</tr>
<tr>
<td></td>
<td>For example, 1000&lt;90&lt;45.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Angles increase in the counterclockwise direction.</td>
<td></td>
</tr>
<tr>
<td>Absolute coordinates</td>
<td>The coordinates based on the origin of the work plane.</td>
<td>$</td>
</tr>
<tr>
<td>Relative coordinates</td>
<td>The coordinates relative to the last position picked.</td>
<td>@</td>
</tr>
<tr>
<td></td>
<td>For example, @1000, 500 or @500&lt;30.</td>
<td></td>
</tr>
<tr>
<td>Global coordinates</td>
<td>The coordinates relative to the global origin and the global x and y directions.</td>
<td>!</td>
</tr>
<tr>
<td></td>
<td>For example, !6000, 12000, 0.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This is handy, for example, when you have set the workplane to a wall and want to snap to a position defined in the global coordinate system without changing the workplane to global.</td>
<td></td>
</tr>
</tbody>
</table>

See also  [Snapping to a position using coordinates on page 75](#)  
  - `XS_KEYIN_DEFAULT_MODE`  
  - `XS_KEYIN_ABSOLUTE_PREFIX`  
  - `XS_KEYIN_GLOBAL_PREFIX`  
  - `XS_KEYIN_RELATIVE_PREFIX`
Example: Placing a drawing object at a specified distance

This example shows how to place a drawing object at a specified distance in the indicated direction. We will use the Enter a Numeric Location dialog box to specify the distance coordinate.

To place a drawing object at a specified distance:

1. Click Shapes --> Draw Line to activate the line tool.

2. Hold down Ctrl and pick an origin.

3. Point to the direction where you want to place the start point of the line.

   Here, the bolt group needs to be moved 30 mm to the right and the line will indicate the new position for the group.

4. Start entering the distance, for example, enter 30. The Enter a Numeric Location dialog box is displayed.

5. When you have entered the distance, click OK. Tekla Structures indicates the start point of the line.
6. Pick an end point for the line.

7. To check that the distance is correct, create a dimension.
7.10 Defining a snap grid

Use a snap grid when you pick points using the Snap to any position snap switch.

To define a snap grid:

1. Click Tools --> Options --> Options... --> Mouse settings.
2. Define the grid spacing intervals in the Spacing boxes.
   - For example, if the spacing of the x coordinate is 500, you are able to snap to positions at intervals of 500 units in the x direction.
3. If needed, define offsets for the snap grid origin in the Origin boxes.
4. To activate the snap grid, select the Activate snap grid when free snap is on check box.

See also Snapping to positions on page 65

See also Snap switches on page 66
7.11 Defining a snap grid in drawings

You can easily align dimensions, mark and associative notes using a snap grid. You can use a snap grid when you pick points using the Snap to any position snap switch.

To define a snap grid:

1. Click Tools --> Options --> Snap settings... to open the Snap dialog box.
2. If you want to see the snap grid symbol, select Symbol.
3. Define the grid spacing intervals in the Spacing boxes.
   For example, if the spacing of the x coordinate is 200, you are able to snap to positions at intervals of 200 units in the x direction.
4. If needed, define offsets for the snap grid origin in the Origin boxes.
5. Click Apply and OK.

7.12 Keyboard shortcuts for snapping

<table>
<thead>
<tr>
<th>Command</th>
<th>Keyboard shortcut</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snap to reference lines/points</td>
<td>F4</td>
</tr>
<tr>
<td>Snap to geometry lines/points</td>
<td>F5</td>
</tr>
<tr>
<td>Snap to nearest points</td>
<td>F6</td>
</tr>
<tr>
<td>Snap to any position</td>
<td>F7</td>
</tr>
<tr>
<td>Ortho</td>
<td>O</td>
</tr>
<tr>
<td>Relative coordinate input</td>
<td>R</td>
</tr>
<tr>
<td>Absolute coordinate input</td>
<td>A</td>
</tr>
<tr>
<td>Global coordinate input</td>
<td>G</td>
</tr>
<tr>
<td>Snap to next position</td>
<td>Tab</td>
</tr>
<tr>
<td>Snap to previous position</td>
<td>Shift+Tab</td>
</tr>
</tbody>
</table>

See also

* Snap switches on page 66
* Assigning a keyboard shortcut for a command on page 24

Snapping to positions 82

Keyboard shortcuts for snapping
Filters allow you to view and/or select objects that have only certain characteristics. This can be useful when you want to perform an operation on several objects at the same time.

You can create filters of your own, or you can use any of the standard filters available in Tekla Structures.

Click the links below to find out more:

- Filtering in models on page 83
- Filtering in drawings on page 86
- Filtering examples on page 89
- Possible values in filtering on page 94
- Copying a filter to another model on page 95
- Deleting a filter on page 95

8.1 Filtering in models

This section describes how to create and use filters in a model.

Click the links below to find out more:

- Creating a view filter on page 83
- Filtering objects using a view filter on page 84
- Creating a selection filter on page 85
- Filtering objects using a selection filter on page 85

Creating a view filter

To create a view filter:

1. Double-click the view to open the View Properties dialog box.
2. Click **Object group...** to open the **Object Group – View Filter** dialog box.

3. Modify the filter settings.
   a. If you want to remove all existing filter rules, click **New filter**.
   b. Click **Add row** to add a new filter rule.
   c. Select options from the **Category**, **Property**, and **Condition** lists.
   d. In the **Value** list, enter a value or select one from the model.
   e. Add more filter rules, and use the **And/Or** options or parentheses to create more complex rules.

4. Select the check boxes next to all filter rules that you want to enable.
   The check boxes define which filter rules are enabled and effective.

5. If needed, define the filter type.
   a. Click to display the advanced saving settings.
   b. Select or clear the check boxes to define where the filter will be visible.
      For example, you can create a filter that can be used both as a view filter and as a selection filter.

6. Enter a unique name in the box next to the **Save as** button.
   Do not use spaces in filter names. To have the filter appear at the top of the list, right after the standard filter, use capital letters in the filter name.

7. Click **Save as** to save the filter.

**See also**  
Filtering objects using a view filter on page 84  
Selecting values from the model on page 97

---

**Filtering objects using a view filter**

View filters define which objects are displayed in a view, based on object properties. The work area, view depth, view setup, and object representation settings also affect the visibility of objects.

To filter objects using a view filter:
1. Double-click the view to open the **View Properties** dialog box.
2. Select a filter from the **Visible object group** list.
3. Click **Modify**.
   Only objects allowed by the filter are displayed.
Creating a selection filter

To create a selection filter:

1. Click Edit --> Selection Filter... to open the Object Group – Selection Filter dialog box (Selection Filter in drawing mode).

2. Modify the filter settings.
   a. If you want to remove all existing filter rules, click New filter.
   b. Click Add row to add a new filter rule.
   c. Select options from the Category, Property, and Condition lists.
   d. In the Value list, enter a value or select one from the model or drawing.
   e. Add more filter rules, and use the And/Or options or parentheses to create more complex rules.

3. Select the check boxes next to all filter rules that you want to enable.
   The check boxes define which filter rules are enabled and effective.

4. If needed, define the filter type.
   a. Click to display the advanced saving settings.
   b. Select or clear the check boxes to define where the filter will be visible.
      For example, you can create a selection filter that can be used both in the model and in drawings.

5. Enter a unique name in the box next to the Save as button.
   Do not use spaces in filter names. To have the filter appear at the top of the list, right after the standard filter, use capital letters in the filter name.

6. Click Save as to save the filter.

See also  Filtering objects using a selection filter on page 85
        Selecting values from the model on page 97
Filtering objects using a selection filter

Selection filters help you select objects in a model or in a drawing. To use selection filters on an object, the object must be visible in the relevant view. The selection switches also affect which objects you can select.

You will find it useful to create selection filters for each part with a different name, for example (column, beam, plate, brace, truss, and footing.

To filter objects using a selection filter:

1. Select a filter from the Available selection filters list:

   ![Available selection filters](image)

2. Select all or part of the objects in the model.

   Only objects allowed by the filter can be selected.

---

The Available selection filters list is not available in drawings. The selection of objects can be done through the Selection Filter dialog box.

---

See also

Creating a selection filter on page 85
Filtering examples on page 89

8.2 Filtering in drawings

You can create drawing view filters for selecting a specific group of view objects. For example, you can use these filters:

- For changing the appearance of a certain object group
- In creating detailed object level settings, which you can apply in the selected views
- For selecting which objects are shown in a drawing view

For general arrangement drawings, you can also create drawing filters that affect the whole drawing, not just a specific view.

Selection filters in drawings work in the similar way as in the model. For example, you might want to:

- Hide parts that belong to the another phase or assembly, and use a selection filter for selecting these parts
- Create a rule set in the Master Drawing Catalog that automatically creates drawings of the desired objects that the filter selects. For example, if you only want to produce drawings of the beams in the model, use a selection filter to select the beams.

See also

Creating drawing filters on page 87
Creating view filters in drawings on page 88
Creating detailed object level settings in a general arrangement drawing...
Example: Applying detailed object level settings on drawing level
Creating a selection filter on page 85

Creating drawing filters

Drawing filters select objects in the whole drawing by criteria that you define.
You can use drawing filters together with saved object property files when you create and apply object level settings in the whole drawing. For example, you might create a filter that selects all beams, then save an object property file that defines that the part color is blue, and then create and apply an object level settings file that changes all beams to blue in the whole drawing.

To create a drawing filter:

1. Click Drawings & Reports --> Drawing Settings and select a drawing type, for example, a general arrangement drawing.
2. Click Filter.
3. Modify the filter settings:
   - To remove all existing filter rules, click New filter.
   - Click Add row to add a new filter rule.
   - Select options from the Category, Property, and Condition list boxes.
     For example, to create a drawing filter for parts, select Parts as the Category, Name as the Property, Equals as the Condition.
   - In the Value box, enter a value or select the required object from the model or drawing.
     For example, select a part from the model.
   - You can add more rows, and use the And/Or options or parentheses to create more complex rules.
4. Select the check boxes next to all filter rows that you want to enable.
   The check boxes define which rows of the filter are enabled and effective.
5. If needed, define the filter type.
   a. Click the double arrow button in the upper-right corner to display the advanced saving settings.
   b. Select or clear the check boxes to define where the filter will be visible.
      For example, you can create a filter that can be used for all drawing types or just for the current drawing type, or a filter that can be used in all drawings and in Organizer.
6. Enter a unique name in the box next to the **Save as** button and click **Save as**.

Do not use spaces in filter names. To have the filter appear at the top of the list, right after the standard filter, use capital letters in the filter name.

7. Click **Cancel** to close the filter properties dialog box.

Now you can use the created drawing filter for example, for creating object level settings in the whole drawing.

See also  Filtering in drawings on page 86

---

**Creating view filters in drawings**

View filters select objects in the selected view by criteria that you define.

You can use view filters together with saved object property files when you create and apply object level settings in the selected view. For example, you might create a view filter that selects all columns in a view, then save an object property file that defines that the part color is red, and then create and apply an object level settings file that changes all columns to red in the selected view.

To create a view filter:

1. Open a drawing.
2. Double-click the view frame.
3. Click **Filter**.
4. Modify the filter settings:
   - If you want to remove all existing filter rules, click **New filter**.
   - Click **Add row** to add a new filter rule.
   - Select options from the **Category**, **Property**, and **Condition** list boxes. For example, to create a view filter for parts, select **Parts** as the **Category**.
   - In the **Value** box, enter a value or select from the model or drawing.
   - You can add more rows, and use the **And/Or** options or parentheses to create more complex rules.
5. Select the check boxes next to all filter rules that you want to enable. The check boxes define which filter rules are enabled and effective.
6. Define the filter type, which tells where the filter is visible by selecting or clearing the check boxes in the **Filter type** area.
7. Enter a unique name in the box next to the **Save** button on the top and click **Save**.
Do not use spaces in filter names. To have the filter appear at the top of the list, right after the standard filter, use capital letters in the filter name.

8. If you want to save the new filter in the view properties, click **Save** in the upper-left corner.

Now you can use the created view filter, for example, for creating object level settings in the selected view.

**See also** Filtering in drawings on page 86

### 8.3 Filtering examples

This section gives some examples of filters that you can create. The same filtering techniques can be used both for view filters and selection filters.

Click the links below to find out more:

- Filtering beams and columns on page 89
- Filtering parts in specific phases on page 90
- Filtering out parts that have a certain profile on page 90
- Filtering assemblies and cast units on page 91
- Filtering sub-assemblies on page 92
- Filtering out reference models on page 92
- Filtering reference model object properties on page 93

**Filtering beams and columns**

To filter beams and columns:

1. Create an empty view or selection filter.
   - To create a view filter, double-click the view to open the **View Properties** dialog box, and then click **Object group**...
   - To create a selection filter, click **Edit --> Selection Filter**...
2. Click **Add row** twice to add two new rows.
3. Fill in the part names, **BEAM** and **COLUMN**.
4. Select the **Or** option. The filter is now looking for an object that has the **Name** **BEAM** or **COLUMN**.
5. Enter a unique name in the box next to the **Save as** button.

6. Click **Save as**.

<table>
<thead>
<tr>
<th>Category</th>
<th>Property</th>
<th>Condition</th>
<th>Value</th>
<th>And/Or</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part</td>
<td>Name</td>
<td>Equals</td>
<td>BEAM</td>
<td></td>
</tr>
<tr>
<td>Part</td>
<td>Name</td>
<td>Equals</td>
<td>COLUMN</td>
<td></td>
</tr>
</tbody>
</table>

**See also**  
Creating a view filter on page 83  
Creating a selection filter on page 85

**Filtering parts in specific phases**

To filter parts in specific phases:

1. Create an empty view or selection filter.
   - To create a view filter, double-click the view to open the **View Properties** dialog box, and then click **Object group...**
   - To create a selection filter, click **Edit --> Selection Filter...**
2. Click **Add row**.
3. Fill in the part phases, 1 and 2. Separate the strings with a blank space.
4. Enter a unique name in the box next to the **Save as** button.
5. Click **Save as**.

<table>
<thead>
<tr>
<th>Category</th>
<th>Property</th>
<th>Condition</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part</td>
<td>Phase</td>
<td>Equals</td>
<td>1 2</td>
</tr>
</tbody>
</table>

If you want to include bolts or welds, note the following:

- If **Category** is set to **Bolt** or **Weld**, bolts and welds are filtered according to their actual phase numbers.
- If **Category** is set to **Part**, **Assembly** or **Object**, bolts and welds are filtered according to the secondary part's phase number. However, if the bolts or welds are connected only to the main part, they are filtered according to the main part's phase number.

**See also**  
Creating a view filter on page 83  
Creating a selection filter on page 85
Filtering out parts that have a certain profile

If you only want to select certain parts, create a complement filter to filter out the remaining parts.

To filter out parts that have the profile BL200*20:

1. Create an empty view or selection filter.
   - To create a view filter, double-click the view to open the View Properties dialog box, and then click Object group...
   - To create a selection filter, click Edit --> Selection Filter...
2. Click Add row.
3. Fill in the profile, BL200*20.
4. Select Does not equal from the Condition list.
5. Enter a unique name in the box next to the Save as button.
6. Click Save as.

<table>
<thead>
<tr>
<th>Category</th>
<th>Property</th>
<th>Condition</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part</td>
<td>Profile</td>
<td>Does not equal</td>
<td>BL200*20</td>
</tr>
</tbody>
</table>

See also  
Creating a view filter on page 83  
Creating a selection filter on page 85

Filtering assemblies and cast units

To filter assemblies or cast units:

1. Create an empty view or selection filter.
   - To create a view filter, double-click the view to open the View Properties dialog box, and then click Object group...
   - To create a selection filter, click Edit --> Selection Filter...
2. Click Add row.
3. In the Category list, select Assembly.
4. In the Property list, select Assembly type.
5. In the Value box, enter the number of the assembly type, or use the Select from model... option to select a value from the model.

<table>
<thead>
<tr>
<th>Value</th>
<th>Assembly type</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>precast</td>
</tr>
<tr>
<td>1</td>
<td>cast in place</td>
</tr>
<tr>
<td>Value</td>
<td>Assembly type</td>
</tr>
<tr>
<td>-------</td>
<td>---------------</td>
</tr>
<tr>
<td>2</td>
<td>steel</td>
</tr>
<tr>
<td>3</td>
<td>timber</td>
</tr>
<tr>
<td>6</td>
<td>miscellaneous</td>
</tr>
</tbody>
</table>

6. Enter a unique name in the box next to the **Save as** button.
7. Click **Save as**.

<table>
<thead>
<tr>
<th>(</th>
<th>Category</th>
<th>Property</th>
<th>Condition</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td>Assembly</td>
<td>Assembly type</td>
<td>Equals</td>
<td>0</td>
</tr>
</tbody>
</table>

See also  Creating a view filter on page 83
Creating a selection filter on page 85

**Filtering sub-assemblies**

To select or view parts that belong to a sub-assembly:

1. Create an empty view or selection filter.
   - To create a view filter, double-click the view to open the **View Properties** dialog box, and then click **Object group**...
   - To create a selection filter, click **Edit --> Selection Filter**...
2. Click **Add row**.
3. In the **Category** list, select **Template**.
4. In the **Property** list, select `ASSEMBLY.HIERARCHY_LEVEL`.
5. In the **Condition** list, select **Does not equal**.
6. In the **Value** list, enter `0`.
7. Enter a unique name in the box next to the **Save as** button.
8. Click **Save as**.

<table>
<thead>
<tr>
<th>(</th>
<th>Category</th>
<th>Property</th>
<th>Condition</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td>Template</td>
<td><code>ASSEMBLY.HIERARCHY_LEVEL</code></td>
<td>Does not equal</td>
<td>0</td>
</tr>
</tbody>
</table>

See also  Creating a view filter on page 83
Creating a selection filter on page 85
Filtering out reference models

To hide certain reference models using a view filter:

1. Create an empty view or selection filter.
   - To create a view filter, double-click the view to open the View Properties dialog box, and then click Object group...
   - To create a selection filter, click Edit --> Selection Filter...

2. Click Add row.

3. In the Category list, select Reference object.

4. In the Property list, select Id number.

5. In the Condition list, select Does not equal.

6. In the Value list, enter the ID numbers of the reference models you want to hide.

   To hide several reference models, separate their IDs with spaces.

7. Enter a unique name in the box next to the Save as button.

8. Click Save as.

   ![Reference object filter example]

See also  Creating a view filter on page 83
Creating a selection filter on page 85

Filtering reference model object properties

You can use the ID number and properties of reference model objects in filtering.

To use reference model objects properties in filtering:

1. Create an empty view or selection filter.
   - To create a view filter, double-click the view to open the View Properties dialog box, and then click Object group...
   - To create a selection filter, click Edit --> Selection Filter...

2. Click Add row.

3. In the Category list, select Template.

4. In the Property list, select the required template attribute, and enter the property value prefix EXTERNAL .

5. In the Condition list, select Equals.

6. In the Value list, select Select from model... and select the required object in the model.
7. Enter a unique name in the box next to the **Save as** button.

8. Click **Save as**.

<table>
<thead>
<tr>
<th>Category</th>
<th>Property</th>
<th>Condition</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Template</td>
<td>EXTERNAL MATERIAL &gt; NAME</td>
<td>Equals</td>
<td>Insulation</td>
</tr>
</tbody>
</table>

### 8.4 Possible values in filtering

You can create filters that contain several properties. You can also have multiple filtering values for each property.

If you use multiple values, separate the strings with blank spaces (for example, 12 5). If a value consists of multiple strings, enclose the entire value in quotation marks (for example, "custom panel"), or use a question mark (for example, custom?panel) to replace the space.

By using conditions, parentheses, and the **And/Or** option you can create filters that can be as complex as needed.

When you create rules between objects that represent different categories, use the **And** option when possible to avoid potential problems with more complex rules.

Empty values are matched to empty properties in filtering.

### See also

- Creating a view filter on page 83
- Creating a selection filter on page 85

---

**Template attributes in filtering**

You can select objects according to template attributes. To do this, select **Template** from the **Category** list, and then select the desired template attribute from the **Property** list.

Use the following units when filtering template attributes, even when using the US Imperial environment:

- **mm** for length
- **mm2** for area
- **kg** for weight
- **degree** for angle
To check which unit Tekla Structures uses for a particular template attribute, use the 
Select from model... option in the Value list.

8.5 Copying a filter to another model

To copy a filter to another model:

1. Select the filter you want to copy.
   The filters you have created are located in the model's \attributes folder. View filters have the file name extension .VObjGrp, and selection filters have the file name extension .SObjGrp.

2. Select where you want to copy the filter.
   - To make the filter available in another model, copy the file to the \attributes folder of the destination model.
   - To make the filter available in all models, copy the file to the project or firm folder, defined by the advanced option XS_PROJECT or XS_FIRM.

3. Restart Tekla Structures.

8.6 Deleting a filter

To delete a filter:

1. Delete the filter file located in the model's attributes folder.
   View filters have the file name extension *.VObjGrp, and selection filters have the file name extension *.SObjGrp.

2. Restart Tekla Structures.
This section provides useful hints and tips that help you use the Tekla Structures user interface and its basic features more efficiently.

Click the links below to find out more:
- Modifying one property in several parts at the same time on page 96
- Copying and moving efficiently on page 97
- If you cannot select objects on page 97
- Selecting values from the model on page 97
- Interrupting object selection on page 98
- Copying Mini Toolbar settings to another computer on page 98
- Wildcards on page 99

9.1 Modifying one property in several parts at the same time
You can quickly change one property in same type of parts at the same time.

To modify one property in several parts at the same time:
1. Double-click a part to open the properties dialog box.
2. Click the switch on/switch off button to clear all selections from the check boxes next to the properties.
3. Select the check box next to the property that you want to change, for example Class.
4. Change the Class value.
   Leave the dialog box open.
5. Select all parts the Class of which you want to change.
6. Click Modify in the part properties dialog box.
7. Click Cancel to close the dialog box.
9.2 Copying and moving efficiently

You can keep the Move and Copy dialog boxes open if you are going to use them often, for example, when creating grids and levels in a new model.

To keep a dialog box open while modeling:
1. Start the Move or Copy command.
2. To stop copying or moving objects, right-click and select Interrupt from the pop-up menu.
   The dialog box remains open on the screen.
3. To continue copying or moving objects:
   a. Click the dialog box to activate it.
   b. Select an object.
   c. Enter the values you want to use, and then click the Move or Copy button in the dialog box.

See also Copying and moving objects on page 43

9.3 If you cannot select objects

If you cannot select the desired objects:
1. Check that you have switched on all the needed selection switches.
2. If you still cannot select them, check also your selection filter settings.

See also Selection switches on page 37
Filtering objects using a selection filter on page 85

9.4 Selecting values from the model

You can select object properties and dates directly from the model. This can be useful when creating view filters, selection filters, and object groups.

Before you start, create an empty view or selection filter, or an object group.

To select values from the model:
1. Click Add row.
2. Select options from the Category and Property lists.
3. In the **Value** list, select one of the options.

   The availability of options depends on your selection in the **Property** list. You can select dates from the model only if the property is a date.
   
a. To select an object property, click **Select from model...** and then select an object.

   b. To select a date, click **Select date...** to open the **Select date** dialog box, and then select one of the options.

   You can either select a date from the calendar, select the review date, or define the number of days before or after the review date. The review date is the same as **Review date** in the **Project Status Visualization** dialog box.

**See also**  
Creating a view filter on page 83  
Creating a selection filter on page 85

### 9.5 Interrupting object selection

You can have Tekla Structures interrupt the object selection process if the selection takes over a defined period of time. For example, if you are working on a large model and you accidentally select all or part of the model, you can interrupt the selection if it takes over 5000 milliseconds (5 seconds) to complete.

To interrupt object selection:

1. You can define the time after which Tekla Structures asks if you want to interrupt object selection.
   
a. Click **Tools --> Options --> Advanced Options... --> Modeling Properties**.

   b. Modify the advanced option.
      
      The default value is 5000 milliseconds.

   c. Click **OK**.

2. Select all or part of the model.
3. When Tekla Structures asks if you want to interrupt object selection, click **Cancel**.

**See also**  
Selecting objects on page 35

### 9.6 Copying Mini Toolbar settings to another computer

After customizing the **Mini Toolbar**, you can copy the settings to another computer. This can be useful, for example, when you want to ensure that everyone in your company uses the same settings. The settings file *teklastructures.minitoolbar.xml* is saved in ..
To copy Mini Toolbar settings:
1. Locate the teklastructures.minitoolbar.xml file on your computer.
2. Copy the file to the appropriate location on the other computer.

See also Customizing the Mini Toolbar on page 17

9.7 Wildcards

You can use wildcards to shorten strings, for example in filtering. A wildcard is a symbol that stands for one or more characters. Tekla Structures uses the following wildcards:

<table>
<thead>
<tr>
<th>Wildcard</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>* (asterisk)</td>
<td>Matches any number or characters</td>
<td>HE* matches all parts with a profile name that begins with the characters &quot;HE&quot;. You can also this symbol at the beginning of a word: <em>BRAC</em>.</td>
</tr>
<tr>
<td>? (question mark)</td>
<td>Matches a single character</td>
<td>HE?400 matches parts with profile names such as HEA400, HEB400, and HEC400</td>
</tr>
<tr>
<td>[ ] (square brackets)</td>
<td>Matches whatever is enclosed in the brackets</td>
<td>L[78]X4X1/2 matches parts with the profile names L7X4X1/2 and L8X4X1/2</td>
</tr>
</tbody>
</table>

The characters * and ? can also be used in object names. If the object name you want to filter contains * or ?, you need to enclose these characters in square brackets. For example, to find the profile P100*10, enter P100[*]10 in the filter field.
The Contact Tekla Support tool allows you to contact your local Tekla support directly. With this tool you can collect the necessary models, files and information for your support case, and safely upload it to Tekla Support.

The Contact Support Tool:

- Automatically identifies the open model and includes the entire model folder as an attachment to your message.
- Automatically gathers license and system information.
- Provides an easy-to-use interface where you can describe your issue, and fill in all necessary information.
- Uploads the message, attached model, other attached files, and all gathered information to your local Tekla support.

Confidentiality information

All files you upload are treated confidential. Only the recipient can access the files.

See also  Filling out and sending a Contact Tekla Support message on page 100

10.1 Filling out and sending a Contact Tekla Support message

To contact Tekla support using the Contact Tekla Support message form:

1. Click Help --> Contact Tekla Support.
2. Fill out the Message tab:
Tekla Structures automatically adds the e-mail address of your local support in the To box. For example, for Finland it is TeklaStructures.support.fi@tekla.com. You can change the e-mail address. The next time you open the Contact Tekla Support message form, the changed address is displayed.

Enter your e-mail address, company name, your name and your phone number in the From boxes.

Enter a subject and/or select a category from a list of predefined categories.

If you want to attach the whole model folder, select Send entire model folder. You can select this option on the Attachments tab as well. But if you know that you want to send the entire model folder, the quickest way to fill out the message form is to fill out only the Message tab and select Send entire model folder.

Enter a description of the problem in the free text area.

3. On the Attachments tab, select what you want to attach:
   - Select Send entire model folder or select specific files from the Files list.
   - If you want to send some other attachments than shown in the Files list, click Attach Extra Files and browse for the files.
   - The total file size of the selected files is displayed in the upper-right corner.

4. Click Send to send your message to the local Tekla support.

While the data is uploaded, Tekla Structures shows a message telling that the files are currently being uploaded to a support server, and that you may close the application.
Uploading should not affect the performance of your computer. When the upload has completed, you will get a notification to your e-mail address.
11 Disclaimer

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