Tekla Structures 2020
Manage Tekla Structures

March 2020

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1 Get started as a Tekla Structures administrator

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

- Installation from the point of view of an organization's Tekla Structures administrator is explained in Tekla Structures installation for administrators (page 11).

- License administration tasks are explained in Manage licenses (page 27).

- You can customize Tekla Structures extensively and distribute the customized configurations using various configuration files. Basic customization tasks are explained in Implementation guide for administrators (page 107) and Environment, company, and project settings for administrators (page 119). See Files and folders in Tekla Structures (page 244) for more detailed information on the file and folder structure.

1.1 Information sources for administrators

Tekla User Assistance

Tekla User Assistance provides help information for all levels of users, including administrators. You can access the Tekla Structures help material in Tekla User Assistance by pressing the F1 button in Tekla Structures. If you have a dialog box open, Tekla Structures takes you straight to the related topic.

By default, all help content is online. Offline help installation packages are available in Tekla Downloads. We recommend that you use the online help when possible as it is updated constantly.

The help is also available when Tekla Structures is not running. Depending on your Windows operating system, through the **Start** menu or **Start screen**, select the Tekla Structures <version> and click **Documentation**.

Release notes and Administrator's release notes

Release notes and Administrator's release notes are published in Tekla User Assistance for each new main and intermediate version of Tekla Structures. They contain very useful information that you can use when upgrading to a newer version of Tekla Structures.

Release notes contains information about the new features, improvements and fixes to existing features. Administrator's release notes contains useful information on how to localize and start using the new features in Tekla Structures.

Tekla Discussion Forum

Tekla Discussion Forum is a useful place to share experiences, ask questions, and discuss with advanced users. You need a Trimble Identity to log in.

Tekla Structures training

To use Tekla Structures to its full potential we strongly recommend users to attend training courses held by the local Trimble Solutions office or a reseller.

Your local support

If you have a valid maintenance contract, you can e-mail or phone your local support for help.

You can find the email address and phone number of your local support in Tekla User Assistance when you are logged in and your account is connected to your organization's group.

2 Tekla Structures installation for administrators

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

To use Tekla Structures, you also need to install a license server.

2.1 Installation requirements

Trimble Identity

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

Each organization has at least one account administrator, who is responsible for managing the organization group used in Tekla Online services. Several people in your organization can be administrators. The first user is invited by a Trimble representative, and that person is then responsible for adding other users and administrators as necessary.

As an administrator, you:

- Invite or approve employees to your organization's user group to allow them maintenance user access in allTekla Online services.

- Add external license users.

- Select who has access to your organization's Online licenses.

- Remove people from your organization's user group when they no longer belong to your organization.

For more information, see Trimble Identity for Tekla Online services and Manage Trimble Identities and Tekla Online licenses.

Operating system and hardware recommendations

Tekla Structures can be installed on recent 64-bit Windows operating systems.

If the operating system is not one of the supported versions of Windows, the installation is cancelled. The installation also requires that Microsoft .NET Framework 4.7.2 or newer is installed on the computer. The installation of .NET Framework 4.7.2 is included in the Tekla Structures installation package, and it is executed if needed. If you create a customized installation package, make sure that the .NET Framework is installed on the client computers. Also see .

For more information on recommended operating system and hardware specifications, see .

2.2 Installing Tekla Structures

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

NOTE You need to install Tekla Structures with administrator rights.

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

Tekla Structures installers are `.msi` installers. Environment `.msi` installers include sets of `.tsep` installers that contain the actual environment files and settings. When installing a new version of Tekla Structures, install the software first and then the environments. The `.msi` installers are installed to your computer before opening Tekla Structures.

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

When running the environment `.msi` installer, you can select in the installation wizard that the `.tsep` installers are run immediately when running the environment installer. If you do not select to do this, the `.tsep` installers are run when you open Tekla Structures for the first time after the installation. In this case, Tekla Structures opens a dialog box that shows the installation progress of the `.tsep` installers.

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

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

Tekla Structures installation wizard has detailed instructions about the installation. For more information, see also .

2.3 Folder structure

Folder structure on local computer

See for information on how the folder structure on the local computer is set up.

Company folder structure

We recommend using a central file folder for storing the models and setup files for the company-specific settings and the project-specific settings. Tekla Structures then reads the settings from the central file server. When upgrading to a new Tekla Structures version, or updating the company logo, for example, the files only need to be replaced in one place. This way taking backups and upgrading is easier.

For more information, see Create project and firm folders (page 245).

Backup

With all valuable information and work your company stores, it is important to take backups of the model folders, and firm and project settings. If your company has a system for taking automatic scheduled backups, schedule your system to take the backups at night time, outside working hours to prevent any possible conflicts in the model. Do not forget to also take a backup of the license entitlements and your active licenses.

Virus protection

Virus protection software has sometimes caused problems in saving models and drawings to the model folder. These problems may occur especially if you have your model saved on a network drive. We strongly recommend that you add Tekla Structures into the safe list of your antivirus system, and set up your virus protection in a way that actions in your model folder are not blocked or scanned.

2.4 Tekla Structures settings in the Windows registry

Windows registry is a hierarchical database that stores configuration settings and options in Microsoft Windows operating systems. Registry settings are used during a Tekla Structures session and during a Tekla Structures installation.

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

User settings

Some of the Tekla Structures user settings, for example, general options, and dialog box locations and sizes are stored in the registry. The settings are saved in a registry key named after the Tekla Structures version number in the registry branch `HKEY_CURRENT_USER\Software\Trimble\Tekla Structures\<VERSION>`.

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

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

Installation settings

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

2.5 Centralized installation of Tekla Structures

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

Centralized installation allows you to run the Tekla Structures installation silently in the background so that the users do not see the installation wizard dialog boxes. For detailed information on centralized installation, see Centralized distribution of Tekla Structures 2020.

2.6 Installation in a virtual environment

You can also run Tekla Structures in a Citrix virtual environment. Application and desktop virtualization allow users to run software from a Citrix server on the network without locally-installed Tekla Structures on their workstation. For detailed information on virtualized installation, see Using Tekla Structures with application and desktop virtualization (page 23).

2.7 Installing the license server

If you only use one license of Tekla Structures, you can install the license server on the same computer as Tekla Structures, making the license available on this one workstation. In an environment with multiple licenses and users, you install the license server in your company network, which allows for more flexible and efficient use of your licenses according to need.

Before users can start using Tekla Structures, you must:

- Install and set up a license server on a computer.
- Save the entitlement certificate and activate the licenses.
- Connect each client computer with Tekla Structures to the license server either manually, through a customized installation or by instructing the users.

For more information, see Tekla Structures licensing system (page 28).

2.8 Installing .tsep packages

Tekla Structures extension packages, `.tsep` packages, are Tekla Structures extensions or additional environment content installers. `.tsep` packages are available for download in Tekla Warehouse.

You can install `.tsep` packages in three different ways.

Direct installation

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

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

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

3. Select the Tekla Structures versions to which you want to import and click the **Import** button. The next time you start Tekla Structures, the extension

is automatically installed, and it is shown in **Tekla Structures extension manager**.

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

Installation in Tekla Structures extension manager

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

1. In the **Applications & components** catalog, click [icon] > **Manage extensions** --> **Extension manager** to open **Tekla Structures extension manager**.

2. Click **Import** and browse to the `.tsep` installer that you want to install.

3. Click **Open**.

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

Uninstall .tsep packages

To uninstall `.tsep` packages, do one of the following:

•   In **Tekla Structures extension manager**, select the `.tsep` packages that you want to uninstall (use **Ctrl** or **Shift** to select more than one), and click **Remove**. The `.tsep` packages are removed when you restart Tekla Structures.

•   Browse to `..\Program Files\Tekla Structures\<version\nt\bin\` and double-click the `TeklaExtensionPackage.Builder.exe` to open the **Tekla Structures Extension Package (TSEP) builder and test runner** dialog box.

    Go to the **Uninstall TSEP based extensions** tab, select the `.tsep` packages that you want to uninstall (use **Ctrl** or **Shift** to select more than one), and click **Uninstall selected**. This will remove all the selected `.tsep` packages. You do not need to restart Tekla Structures.

Centralized installation

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

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

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

- The installed `.tsep` installers are stored in the `%XSDATADIR%\Extensions\Installed` folder.

- Invalid `.tsep` installers are uninstalled and moved to the `%XSDATADIR%\Extensions\Invalid installations` folder.

- Cancelled `.tsep` installers are stored in `%XSDATADIR%\Extensions\Cancelled installations`.

Copying `.tsep` installers

We recommend that you use `ROBOCOPY` from the command prompt (`cmd.exe`) to copy the `.tsep` installers. More information on `ROBOCOPY` can be found on the Microsoft website, for example.

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

For example, to copy `.tsep` installers in Tekla Structures 2020:

```
robocopy
"\\Server1\prod\TeklaStructures\2020.0\Environments_TSEP"
"C:\ProgramData\Trimble\Tekla Structures\2020.0\Extensions\To be
installed"
*.tsep
"C:\Program Files\Tekla Structures\2020.0\nt\bin
\TeklaExtensionPackage.TepAutoInstaller.exe"
2020.0 "C:\ProgramData\Trimble\Tekla Structures\2020.0" "2020"
```

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

Centralized uninstallation

You can uninstall `.tsep` packages in batches by creating an empty file without an extension, with the name `RemoveExtensionOnStartup`, in `\ProgramData\Trimble\Tekla Structures\<version>\Extensions \Installed\[Extension_To_Be_Uninstalled]`. The extensions are removed the next time Tekla Structures is started.

2.9 Collaborative modeling

Several people can simultanously work in the same Tekla Structures model.

If your company takes part in external projects, or if more than one user works with the same model at different locations, we recommend that you use Tekla Model Sharing. With Tekla Model Sharing, the users in your company can work with the same shared model, offline and with high performance, and synchronize the changes with other team members even in a low-speed network.

If you work in a local team and prefer not to use Internet while working on your models, you can use the multi-user mode.

For model coordination and exchange of other project files, we offer Trimble Connect. To find out more and set up collaboration in your organization, see Tekla Model Sharing and multi-user for administrators (page 371) and Working collaboratively within a Tekla Structures model.

2.10 Upgrading Tekla Structures

You can install service packs on top of the existing installation of Tekla Structures. You can update to new service packs without updating the existing licenses. A new Tekla Structures version installs as a separate instance and can exist on the same workstation with other Tekla Structures versions. An update to a new version requires that you also update your licenses, as the licenses have a highest allowed version.

If you already have an older version of Tekla Structures installed on your computer, you can use Migration Wizard to copy the personal settings to the new version. With the Migration Wizard you can choose to copy any of the following settings and values:

- `user.ini` file
- Registry values, such as:
  - Toolbars
  - Dialog boxes
  - General options

When you customize Tekla Structures, for example, add or change drawing or report templates and catalog entries, we strongly recommend that you create project and firm folders for the customized files. This is useful if you want to store the files for future use, or if you want to retain them when you install a new release.

Tekla Structures does not replace files in the project and firm folders when you install a new release. You can retain your customized files without having to copy and paste, or export and import from the previous versions. This makes upgrading faster and easier. If you have customized previous Tekla Structures versions without using firm or project folders, you will need to transfer the customized information to the next Tekla Structures version.

Before you start using a new Tekla Structures version, always test that the old company settings work.

TIP If you want to copy the settings later, you can start Migration Wizard manually by double-clicking the `MigrationWizard.exe` in the `\Tekla Structures \<version>\nt\bin\applications\Tekla\Migrations` folder. You can select the version from which the settings are copied and the version to which the settings are copied.

2.11 Create start-up shortcuts with customized initializations

You can use shortcuts to start `teklastructures.exe` with customized initializations. You can use this functionality to create shortcuts for different purposes, for example, to have customized setup files depending on the client you are working for in a project. The Tekla Structures installation automatically creates shortcuts for the selected environments.

NOTE We recommend that only administrators create the customization and the necessary shortcuts. Otherwise, your settings may differ from the settings defined for your firm, or for the particular project you are working for.
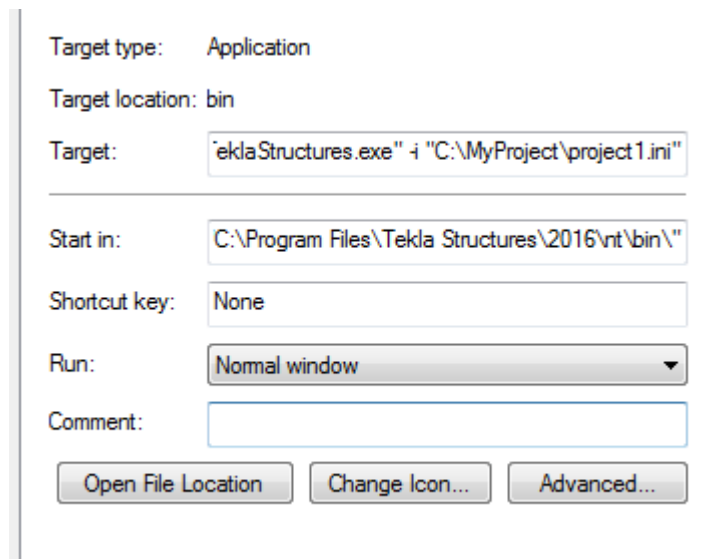
Create a start-up shortcut with customized initialization

1. Open the `user.ini` file using any standard text editor.

2. Save the file with a new name, for example, `customer.ini` or `project.ini`.

3. Modify the file by adding the required settings.

4. Save the modified initialization file.

5. Open the Windows **Start** menu and select **All Programs** --> **Tekla Structures <version>** .

6. Right-click **Tekla Structures <version>** and select **Copy**.

7. Paste the shortcut to your desktop.

8. Select the shortcut, right-click and select **Properties**.

9. Modify the **Target** of the shortcut by adding the required project initialization information to it.

   First enter the path to the current `teklastructures.exe`, then the desired parameters.

   Use the quotation marks (") in the path to avoid possible problems if the path contains spaces. If you have installed Tekla Structures to a path that does **not** contain spaces, there will be no problems even if you remove the quotations marks, for example, `C:\TeklaStructures\`. If you have installed Tekla Structures to a path that contains spaces, the quotation marks are needed, for example, `C:\Program Files\Tekla Structures\`.

   The maximum length of a shortcut is 256 characters. If you have problems with the length, you can call all other necessary initialization files from your customized initialization file instead of adding them to the shortcut.

10. To override the settings defined in the shortcuts, use the parameter `-i <initialization_file>` in the `user.ini` and `option.ini` files.

Available parameters in shortcuts

The table below lists the parameters you can use in the start-up shortcuts.

The parameters can be used in combinations. You can set the parameters to automatically bypass the **Tekla Structures - Choose setup** dialog box, open a model and run a macro, for example.

Parameter	Description

`-I <ini_file_pat h>`	The given `.ini` file is **loaded before** the environment `.ini` files. This parameter can be specified multiple times.
	
	This parameter can be used to bypass the **Tekla Structures - Choose setup** dialog (the login dialog).
	
	Example:
	
	`"C:\Program Files\Tekla Structures`
	`\<version>\nt\bin\TeklaStructures.exe"`
	`-I "C:\ProgramData\Trimble\Tekla`
	`Structures\<version>\Environments\uk`
	`\Bypass.ini"`

`-i <ini_file_pat h>`	The given `.ini` file is **loaded after** the role `.ini` files. This parameter can be specified multiple times.
	
	Example:
	
	`"C:\Program Files\Tekla Structures`
	`\<version>\nt\bin\TeklaStructures.exe"`
	`-i "C:\TeklaStructures\MySettings.ini"`

To open an existing model
 	
`<model_path>`
	The given model is opened after start-up.
	
	Example:
	
	`"C:\Program Files\Tekla Structures`
	`\<version>\nt\bin\TeklaStructures.exe"`
	`"C:\TeklaStructuresModels\My model"`

To open an existing, autosaved model
 	
`<model_path> /autosaved`
	The given autosaved model is opened after start-up.
	
	Example:
	
	`"C:\Program Files\Tekla Structures`
	`\<version>\nt\bin`
	`\TeklaStructures.exe""C:\TeklaStructure`
	`sModels\My model" /autosaved`

To create a new model without a model template
 	
`/ create:<model _path>`
	A new model is created after start-up.
	
	Example:
	
	`"C:\Program Files\Tekla Structures`
	`\<version>\nt\bin\TeklaStructures.exe"/`
	`create:"C:\TeklaStructuresModels\My`
	`model"`

Parameter	Description
To create a new model using a model template `/create:<model_path> /modelTemplate:<template_name>`	A new model using a model template is created after start-up. Example: `"C:\Program Files\Tekla Structures\<version>\nt\bin\TeklaStructures.exe"/create:"C:\TeklaStructuresModels\My model" /modelTemplate:"Cast-in-Place"`
To create a new multi-user model `/create:<model_path> /server:<server_name>`	A new multi-user model is created after start-up. Example: `"C:\Program Files\Tekla Structures\<version>\nt\bin\TeklaStructures.exe"/create:"C:\TeklaStructuresModels\My model" /server:"my-server:1234"`
To run a macro after start-up `-m <macro_file_path>`	The given macro is executed after start-up. The example below opens Tekla Structures, sets the environment, role and configuration from the `Bypass.ini` file, opens the model, and reads in and saves the model by using the **Example Macro: Model Sharing Read in and Save** from the **BIM Publisher** tool that is available in Tekla Warehouse. `"C:\Program Files\Tekla Structures\<version>\nt\bin\TeklaStructures.exe" -I "C:\ProgramData\Trimble\Tekla Structures\<version>\Environments\<environment>\Bypass.ini" "C:\TeklaStructuresModels\<model>" -m "C:\ReadInSave2016.cs"`

Example of an initialization file

Below is an example of a customized project initialization file that calls other initialization files.

```
MyProject.ini
//The project is based on the default UK settings
call C:\ProgramData\Trimble\Tekla Structures\2019.0\Environments\uk
\env_UK.ini
//..but our company policy requires these changes
call c:\CompanySettings\OurPolicy.ini
//..and the fabricator requires something
call c:\Fabricators\Fabricator1.ini
//..and then we let users to make some changes (color etc.)
call c:\Users\user_%USERNAME%.ini
```

The project shortcut for this initialization file:

```
"C:\Program Files\Tekla Structures\<version>\nt\bin\TeklaStructures.exe" -
i "\\MyServer\MyProject\MyProject.ini" "\\MyServer\MyProject\MyModel\"
```

2.12 Using Tekla Structures with application and desktop virtualization

Using Tekla Structures with the Citrix application and desktop virtualization is a flexible and safe way to quickly add users to Tekla Structures projects without locally installing Tekla Structures and copying project data to a user's computer. Citrix application and desktop virtualization products are products of Citrix Systems, Inc.

The image below shows the main concepts in Tekla Structures virtualization.
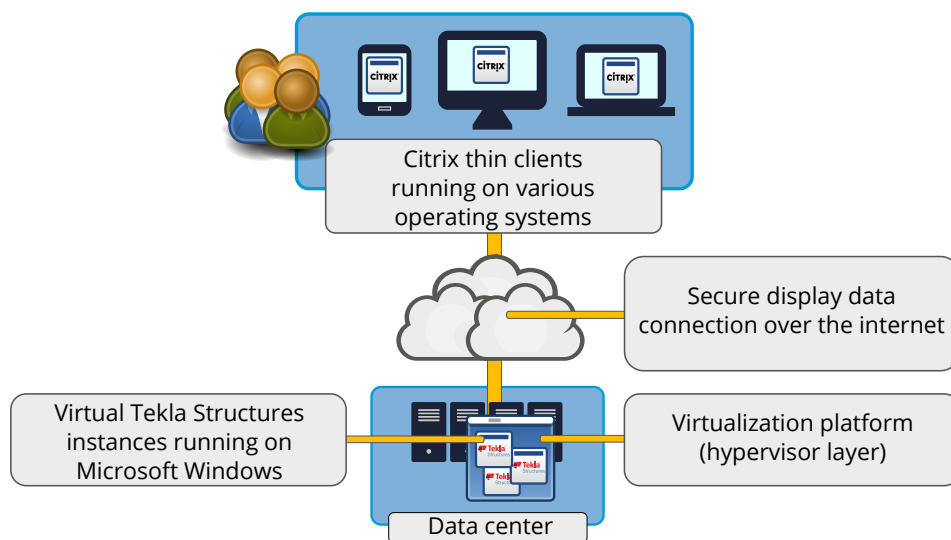
Streaming applications from the server enables the use of Tekla Structures on client computers, tablets and smartphones that have different hardware and software configurations. Tekla Structures runs on Windows on the remote server and the virtualization solution allows client devices to be used for display and user input.

Users connect through a secure connection to the data center located in your premises or in the cloud. The project data is protected as everything is stored only on the server. Using Tekla Structures from a centralized location ensures that all users in the project are using the same project environment set-up.

Prerequisites for using Tekla Structures in a virtual environment

Citrix virtualization is set up either on a physical server or on a virtual server. Recommended hardware is described in Hardware recommendations for running Tekla Structures on Citrix and .

For detailed instructions on installing and setting up XenApp and XenDesktop, see the Citrix documentation.

The image below shows the main components in Tekla Structures virtualization.
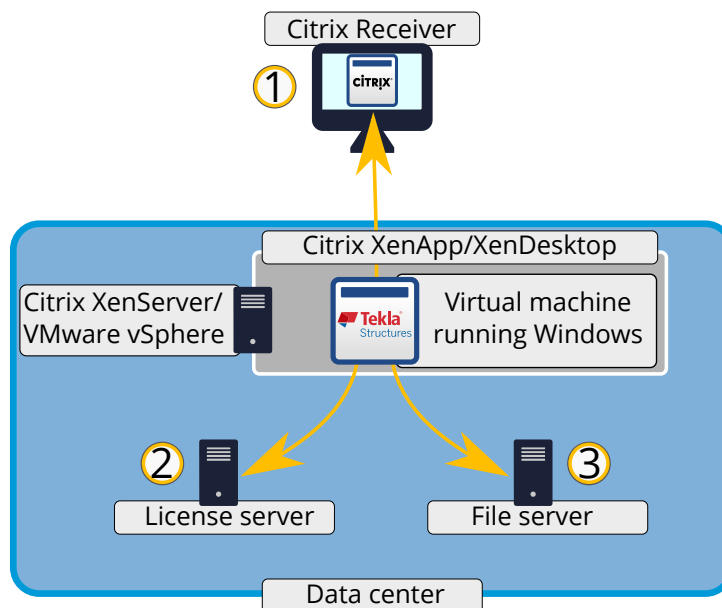
1. Thin client application: users can access Tekla Structures with Citrix Receiver through Citrix XenApp client or Citrix XenDesktop desktop viewer on any supported operating system and hardware. Multiple concurrent clients may share one virtual machine instance.

   A good internet connection is required. Recommended network bandwidth is 1 Mbps or more.

2. Each `TeklaStructures.exe` running on the virtual machine needs a valid license.

   Local, enterprise, or cloud Tekla license server can be used, and the license server can be hosted in or out of the data center.

3. Read/write project files from network-attached storage (NAS). Fast disk access is needed. Never use the local disk of the virtual server for saving model folders.

   Accessing any files from the client's local file system requires uploading the files to the server, which may be very slow and should be avoided as

much as possible. Project data including environments should be stored on another (server) machine in the data center or file system inside the company network.

The key components for using Tekla Structures with the Citrix application and desktop virtualization are:

- High-end Windows server that can serve multiple concurrent users. The server is typically set up by the company's IT department.

- A file server that provides fast access to project files from the virtualization server.

- Tekla Structures installed on the server or on the virtual machine running on the server.

- A reliable connection from the virtual hosts to Tekla license server as each Tekla Structures user needs a valid Tekla Structures license

- Delivery groups (user groups) and access rights, which are defined on the server with Citrix Studio.

  - Delivery groups are set up by the administrator of the virtualization environment.

  - Access rights for delivery groups must be defined by the administrator on the server.

- Citrix Receiver installed on client computers. The Citrix Receiver is typically delivered through an Internet browser and installed by the end-user.

Set up the virtual environment for Tekla Structures

You need to set up the server, define delivery groups, install the Tekla Structures software and environments on the server, and Tekla Structures users need to install the Citrix Receiver on their computers.

1. Set up the server.

   The server must be a high-end computer with a fast graphics card, a fast processor, and enough main memory for each user depending on the size and level of detail of the projects they are working on. See Hardware recommendations for running Tekla Structures on Citrix for more detailed information.

   For detailed instructions on installing and setting up XenApp and XenDesktop, see the Citrix documentation.

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

   NOTE Storing models on the virtual computer local disk may cause access problems. Use a dedicated file server for models, and

remember to select the correct network location for the model folder during the Tekla Structures installation.

Tekla Structures environment settings are the same for all users that use the same virtual computer. In the same manner as with normal desktop installations, you still have to make sure that the environments on different virtual machines are the same or matching.

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

3. Install the Citrix Receiver on the Tekla Structures client computer:

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

   a. Open the Citrix Receiver web user interface in your web browser.

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

   b. Install the Citrix Receiver client software by following the steps in the installation wizard. Do not create an account, or login in the installation wizard, but finish the installation and return to the web user interface.

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

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

   You can now start using Tekla Structures on the virtual desktop, in the same manner as if it was installed on your own computer.

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

   • Note that referencing local files from your computer directly in Tekla Structures is not recommended. If you need to access those files in Tekla Structures, you should copy them to a shared network location first.

   • Note that model folders are not copied to the client computers.

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

3 Manage licenses

There are two main types of licenses in Tekla Structures:

- On-premises licenses licenses that you activate locally on your license server. These are used for activating most configurations.

- Online licenses that are used for activating additional features, such as Tekla Model Sharing and some special configurations, such as Tekla Structures learning and partner configurations.

  For online license instructions, see Manage Trimble Identities and Tekla Online licenses.

To get started with standard license administration:

1. Make sure you understand how licensing works, see Tekla Structures licensing system (page 28).

2. Install the license server as explained in Installing Tekla license server (page 42).

3. Make sure the license server can connect to Trimble's activation server and clients can connect to the license server, see Allowing Tekla license server to operate through Windows Firewall (page 51).

4. Activate your licenses on the server as explained in Activate Tekla licenses (page 62).

5. Test that licensing works and connect the clients to the license server as explained in Preconfigure license server settings for users (page 66).

Additionally, you can ensure that the correct types of licenses are available to the users who most need them by defining access rights for using and borrowing licenses as explained in Modify Tekla license access rights (tekla.opt) (page 71). This can prevent situations where there are no licenses available for users that need them because someone else has reserved or borrowed a license that they do not really need.

When you renew licenses and when you need to make hardware changes on the license server, you must deactivate your licenses as explained in Deactivate Tekla licenses (page 67).

If your licenses have become untrusted or disabled, they cannot be used and you need to repair them. For information about how to do this, see Repair a license (page 76).

See also

Troubleshoot Tekla licensing (page 77)

3.1 Tekla Structures licensing system

Tekla Structures uses FlexNet (FlexNet Publisher License Management) licensing system by Flexera Software. We provide our own Tekla-specific tools for managing the licenses on top of the common FlexNet platform, replacing some of the standard tools you may have encountered when using other software products that use FlexNet for licensing.

The license server software is compatible with several versions of Tekla Structures. To see which license server version to use with your current Tekla Structures version, see Hardware recommendations for Tekla 2020 license server. The licenses are also compatible with older versions of Tekla Structures in addition to the highest allowed version stated in the license. The license is sent to you attached in an email as an entitlement certificate HTML file.

NOTE Keep backup copies of your license entitlements in a safe place.

The standard FlexNet licensing is complemented by online licenses, which are connected to the users' Trimble Identity login. These are used for special configurations of Tekla Structures, such as the Partner and Learning configurations, and some additional features, such as Tekla Model Sharing. For more information about licensing Tekla Structures Learning Edition, visit the Tekla Campus site.

Local licensing on your workstation

If there are few users in your organization and you do not need to share the same licenses between users, you will install a license server directly on the Tekla Structures workstation. When you activate a license on the local license server, Tekla Structures always uses that license and you can also start Tekla Structures offline without borrowing a license. If you want to use this type of setup, see .

For organizations with many users, it is not optimal to install and manage a license server on each workstation because of the extra work involved, lack of visibility and inability to flexibly share licenses between users. In this situation, it is better to set up a central license server in your internal network.

License server in your local area network (floating licenses)

The illustration below shows how licensing works in a typical corporate setup where licenses are activated on a centrally-managed license server.
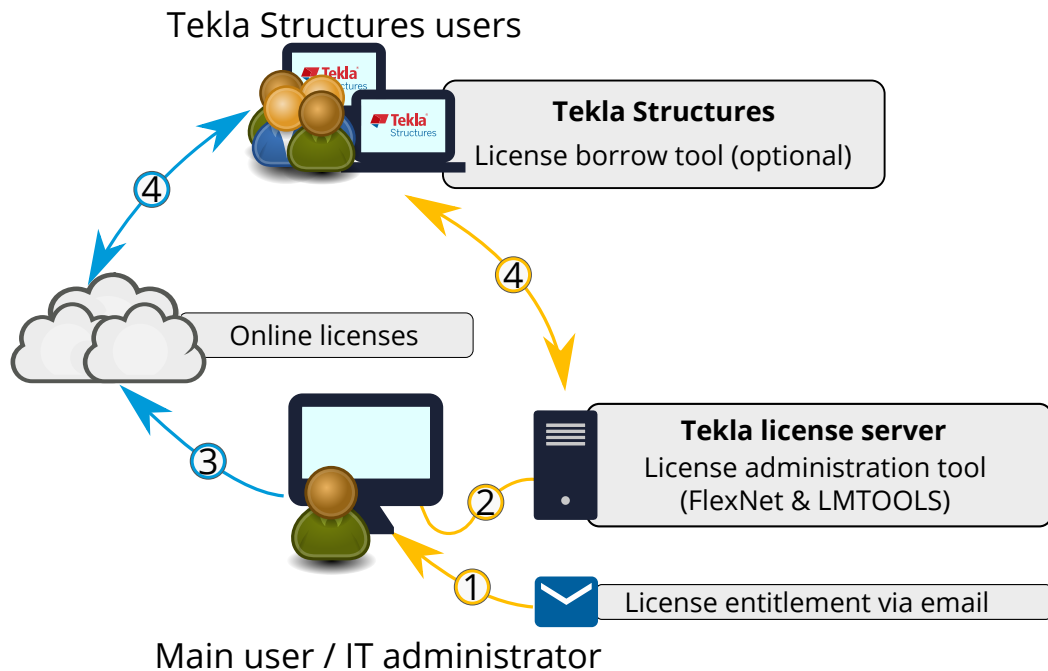
1. An administrator (main user or IT administrator) receives entitlement certificates for new and updated FlexNet licenses as email attachments.

2. The administrator activates and manages the FlexNet licenses in the Tekla License Administration Tool on the license server installed at your organization.

   For successful activation, the system must be able to contact Trimble's online license activation service.

3. The administrator adds users to your organization and allows access to your purchased online licenses in the Tekla Online Admin tool.

   Exception: users must get their free learning license themselves at the Tekla Campus site.

4. Tekla Structures installations on the end-users' workstations reserve a license on the license server or in the cloud when a user starts Tekla Structures or joins Tekla Model Sharing. When the user stops using Tekla Structures, the license reservation is revoked.

   • You can optionally allow users to borrow licenses for a set period of time, which allows the user to start Tekla Structures without network access to the license server. To borrow a license, the user must have the license borrow tool installed on their workstation.

   • Online licenses cannot be borrowed; users must have internet access to start Tekla Structures with an online license. For more information

about online licenses, see Manage Trimble Identities and Tekla Online licenses.

Tekla Structures holds licenses in trusted storage. This means that Tekla Structures does not support three-server redundancy, where licenses are held in license files. However, you may have any number of license servers, and use search paths for defining and finding them.

Using multiple license servers in one company

You may want to spread your license pool on several servers in your company. You may have offices in many cities, each office with its own license server, or you may simply want to divide the license pool to minimize disruption caused by server downtime.
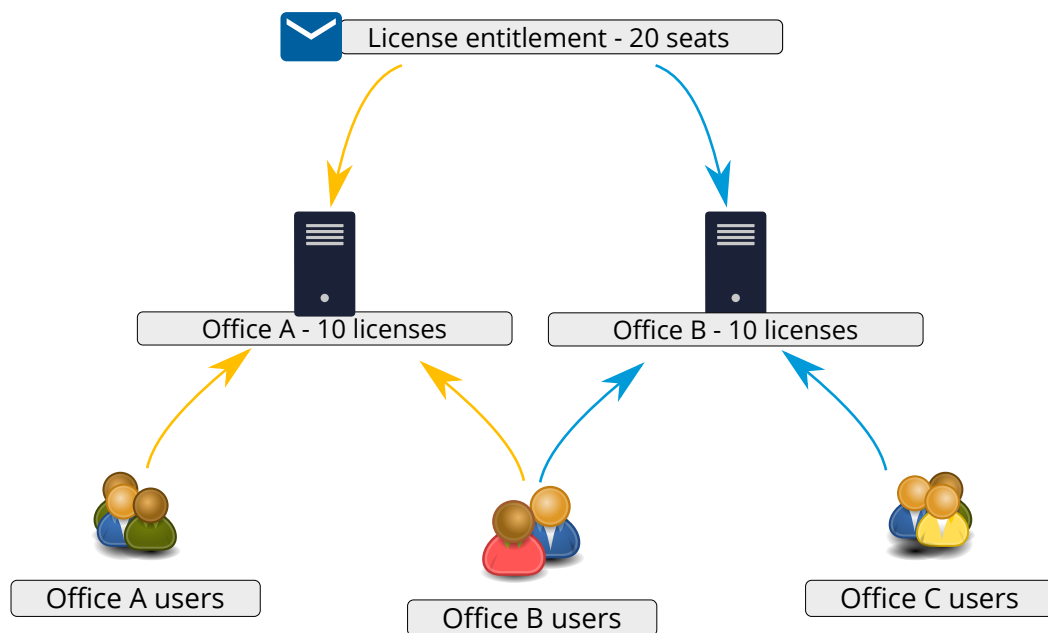
You do not have to activate all of the licenses on the same license server even if they are on the same entitlement certificate. For example, you can divide your total license entitlement on several servers simply by activating one half of your licenses on one server and the other half of the licenses on another server. Or, as another example, you can activate some of the licenses on a common server and the rest locally on each user's computer. You can easily change the location of the licenses by deactivating them on one license server and activating on another so you can adjust the number of licenses to changes in your user base over time.

In Tekla Structures, you can define two server addresses separated by a semicolon (;). This way, if there is a maintenance break on one of the servers, users can obtain the license from the other server.
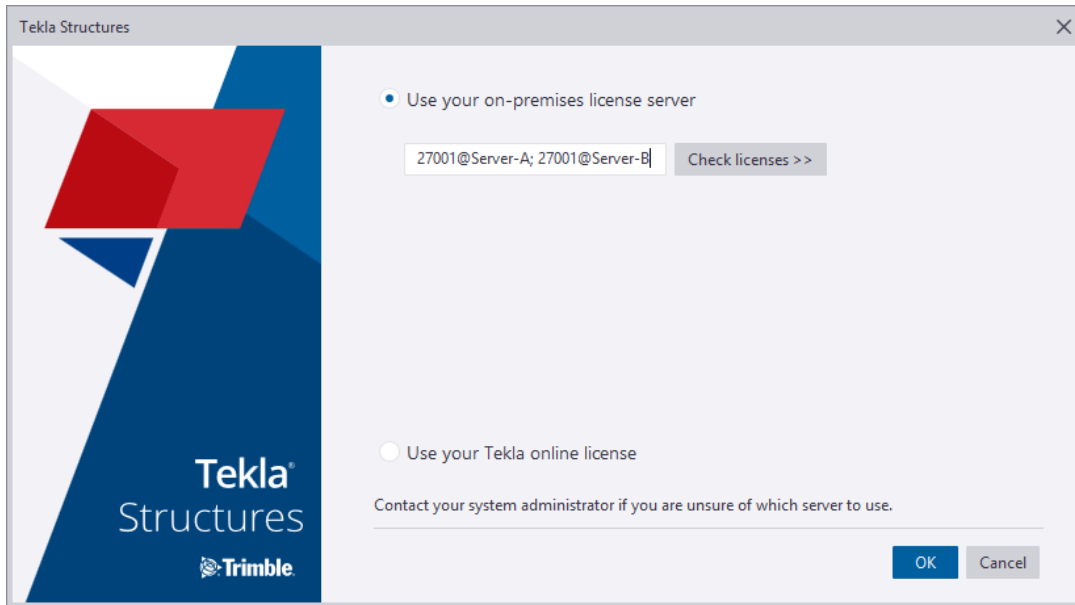
> **NOTE** Defining several license servers may slow down the starting of Tekla Structures. Therefore, we do not recommend defining more than two servers.

License server hardware

The Tekla license server does not need high performance hardware. However, it is important to ensure that the network connection and server hardware are reliable, and to maintain the server system carefully.

> **NOTE** **Deactivate your licenses** before you make changes to the hardware or perform a major operating system upgrade on the license server computer. Keep copies of your license entitlement certificate(s) in a safe place in case something goes wrong, so that you can easily and quickly activate the deactivated licenses on a different system. You can only activate the same licenses again if they have first been deactivated on the previous system. If the license server system becomes permanently inoperable with the licenses still activated, contact your local Tekla support for assistance.

See Tekla license server 2020 hardware recommendations for information on operating systems and virtual machine platforms.

Configuration features

You have fine-grained control over the license use:

• You can control license use based on the license type (enterprise/domestic) or Tekla Structures configuration.

• You can define minimum and maximum numbers of licenses users/user groups have available.

- You can allow or prevent license borrowing from named users/user groups.

The configurations can be done based on host addresses, individual user names or by user groups. See Modify Tekla license access rights (tekla.opt) (page 71) for more information.

Checklists for licensing implementation

There are several prerequisites the administrator needs to take into account before starting with FlexNet licensing. Take a look at the following listings:

- Checklist of Trimble deliverables needed in Tekla licensing (page 32)
- Checklist of IT resources needed in Tekla Structures licensing (page 33)
- Checklist for the Tekla license server administrator (page 34)
- Rights needed for performing administrator's tasks in Tekla Structures licensing (page 35)

Additional information sources

In addition to Tekla Structures specific documentation, you can find useful information on the FlexNet system in the documents provided with the installation and in Tekla Downloads. The following **FlexNet License Administration Guides** by Flexera Software are generic guides that contain, for example, instructions on how to create user groups and manage access rights:

- `C:\Tekla\License\Server\fnp_LicAdmin.pdf`
- `C:\Tekla\License\Server\LicenseAdministration.pdf`

See also

Distributing and managing Tekla licenses (page 35)

Examples of different Tekla Structures licensing system setups (page 37)

Installing Tekla license server (page 42)

Checklist of Trimble deliverables needed in Tekla licensing

To get started with the FlexNet licensing, the administrator needs to have the following items provided by Trimble:

- **Entitlement certificate**

  Trimble has sent the license entitlement certificate in an e-mail to the person in your organization who has made the license purchase, or to someone named as the contact person. The entitlement certificate lists all

the Tekla Structures licenses you are entitled to use and includes the activation IDs for entitled licenses.

For entitlement requests, contact your local Tekla representative.

- **Tekla license server installation package**

    The Tekla license server installation package is available on Tekla Downloads product download service. The installation package contains the license server files and Tekla License Administration Tool.

- **License Administration Guide**

    This guide by Flexera Software is a general guide that contains, for example, instructions on how to create user groups and manage access rights. This guide is provided in the license server installation package and is installed in the folder where you install the license server in the `.pdf` format.

Checklist of IT resources needed in Tekla Structures licensing

You need to take into account the following IT resource related requirements:

- **Supported operating system**

    The FlexNet licensing system for Tekla Structures runs in Windows operating system. The support for virtual servers is limited. For more information, see Tekla Structures Hardware recommendations in Tekla User Assistance.

- **Windows user account with administrator rights**

    Your Windows login user name should not contain any special characters.

    You need to have administrator rights to install and manage the license server. For more information, see Rights needed for performing administrator's tasks in Tekla Structures licensing (page 35).

- **TCP/IP port 27007 for license server**

    Tekla licensing service (`lmgrd`) is automatically run in the TCP/IP port 27007. This port should be dedicated for Tekla licensing service only. If required, you can manually set a different TCP/IP port for the licensing service, see Modify the license file tekla.lic manually (page 48).

- **Local area network**

    The license server and the client computers need to be in the same local area network. The clients need to be able to contact the license server. If there is no local area network in your company, we recommend that you install the license server on each computer that has Tekla Structures and activate one license on each computer.

- **Internal firewall and direct communication**

  The internal firewall of your company (for example, Windows Firewall) must allow the communication between the server computer and the computers with Tekla Structures. You must allow the applications `tekla.exe` and `lmgrd.exe` to operate through the firewall. For more information, see Allowing Tekla license server to operate through Windows Firewall (page 51).

  Direct communication from the server computer to the Internet needs to be allowed when the license server at your company contacts the activation server at Trimble Solutions. The activation communication uses SOAP over HTTPS on the TCP/IP port 443.

  Your firewall should not block any incoming or outgoing information during the activation. To allow the activation communication, use the activation server address in your firewall settings:

  https://activate.tekla.com:443/flexnet/services/ActivationService?wsdl

  If direct communication from the server computer to the Internet is not allowed, contact your local Tekla Structures support for manual activation.

- **System backup settings**

  If you have an automatic backup and restore system in your company, configure your system so that it does not overwrite your actual Trusted Storage with the backup copy. Trusted Storage is the place where the licensing information is stored on the server computer, and it is located in `C:\ProgramData\FLEXnet` depending on the operating system.

Checklist for the Tekla license server administrator

Your company or organization should assign an administrator for the license server. The license server administrator's primary responsibilities are:

- Install the Tekla license server: Installing Tekla license server (page 42)

- If automatic installation is not possible, manually install and configure Tekla license server: Install Tekla license server - manual installation (page 45), Configure Tekla license server manually (page 49), Modify the license file tekla.lic manually (page 48)

- Save the entitlement certificate on the license server computer and activate licenses on the server to make the licenses available for Tekla Structures users, or for yourself, if the license server is installed on your own computer: Activate Tekla licenses (page 62)

- Inform users of the license server name and port number so that they can connect Tekla Structures to the server: Preconfigure license server settings for users (page 66)

- If necessary, modify the firewall settings to allow licensing traffic: Allowing Tekla license server to operate through Windows Firewall (page 51)
- If necessary, modify license access rights in the `tekla.opt` options file: Modify Tekla license access rights (tekla.opt) (page 71)
- Export a customized product ID files for license borrowing and deliver them to offline users: Provide offline users with a customized product ID file (page 101)
- Inform users of the license policy of the company and monitor license use.

Rights needed for performing administrator's tasks in Tekla Structures licensing

You need to have Windows administrator rights to install and manage the license server. Some applications also need to be run as administrator separately. This depends on the Windows version you are using.

- In **Windows 7**, **Windows 8/8.1** and **Windows 10**, you need to log in as administrator. In some cases, you need to run applications as administrator. To do this, go to the folder containing the application, right-click the application and select **Run as administrator** from the pop-up menu.

- In **Windows Server** you need to log in as administrator. In some cases, you need to run applications with *unrestricted rights*. To do this, right-click the application, select **Run as**, and clear the **Run this program with restricted access** check box.

Distributing and managing Tekla licenses

The FlexNet licensing system offers several options for distributing licenses to users. The way you distribute the licenses depends on the size of the company or organization, and the amount of Tekla Structures users.

There are two basic ways of distributing licenses to users:

- The licenses are available for multiple users on a common license server.

- The licenses are activated on each user's own computer.

You can also use a combination of license distribution methods. For example, you can activate one license on a separate computer and activate the rest of your licenses on a common license server.

The following table shows what is typical for managing the licenses that are activated separately on each computer, and for licenses that are activated on a common license server.

Licenses are activated on user's own computer	Licenses are activated on a common license server
No need for an assigned license server administrator.	Centralized maintaining and administration of licenses is needed.
Each user manages the license server that is installed on the user's own computer.	A license server administrator maintains the license server and manages the license use.
	Typically, there are a few Tekla Structures main users in a company. The main users are good candidates for license server administrators, because they are already familiar with Tekla Structures. For more information on the responsibilities of the license server administrator, see Checklist for the Tekla license server administrator (page 34)
No need to manage license access rights.	By default, all license configurations activated on the server are available for all Tekla Structures users. However, centralized access rights management is possible.
Each user activates only the licenses that are needed.	
	The license server administrator can give different users access to different configurations. The license server administrator needs to modify the `tekla.opt` options file to manage the license access rights. For more information on managing license access rights, see Modify Tekla license access rights (tekla.opt) (page 71).
Tekla Structures can be used out of office.	Tekla Structures can be used out of office.
If the user's license is activated on a computer, license borrowing or a VPN connection is not needed.	A user needs to borrow a license from the common license server or use a VPN connection to the license server to use Tekla Structures out of office.
Licenses are used only by one person.	Licenses are checked out frequently by several users.
Users have access only to the licenses that are activated on their own computer. If a user needs a license that is activated on another computer, the user needs to use the other computer. Another option is to deactivate licenses on one computer	When the licenses are activated on a common server, they are available for multiple users. The licenses are checked out from the license server only when they are needed. When a user does not need a license, the user

Licenses are activated on user's own computer	Licenses are activated on a common license server
and activate them on another, which requires effort.	closes Tekla Structures and the license becomes available for another user. Switching from using one license to another is simple.
	Rules of license usage Tekla Structures users should accept common rules or an internal company policy. The rules should contain regulations of managing the licenses, for example, who is allowed to borrow licenses. Usage of common rules minimizes the amount of conflicts in license management.

Examples of different Tekla Structures licensing system setups

The purpose of the following examples is to provide guidelines for license management in companies or organizations of different sizes.

Example 1: One Tekla Structures user, all licenses activated on one computer

Only one user in the company uses Tekla Structures. The user installs Tekla Structures and the license server on the same computer.

• Installing the license server is straightforward, and the default license server settings can be used. The user does not need to modify the license server settings, because the user runs the license server and Tekla Structures on the same computer.

• Because the user installs the license server on a computer, the user does not need to borrow a license or use a VPN connection to use Tekla Structures out of office.
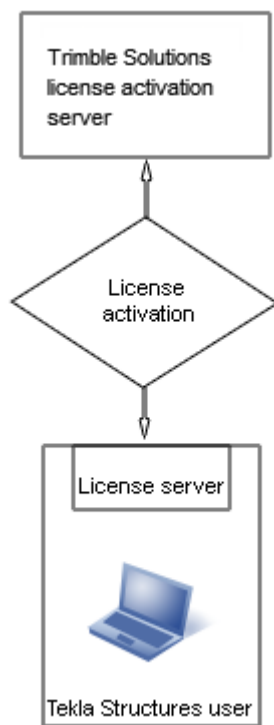
Example 2: Three Tekla Structures users, necessary licenses activated separately on each computer

There are three Tekla Structures users in a company. Because the users use different Tekla Structures configurations, each user installs a license server separately on the user's own computer and activates only the needed licenses.

- A license server administrator is not needed, the users maintain their license servers.

- Because the users install the license servers on their computers, they do not need to borrow a license or use a VPN connection to use Tekla Structures out of office.

Trimble Solutions license activation server

License activation

License activation

License activation

License server — Tekla Structures user

License server — Tekla Structures user

License server — Tekla Structures user
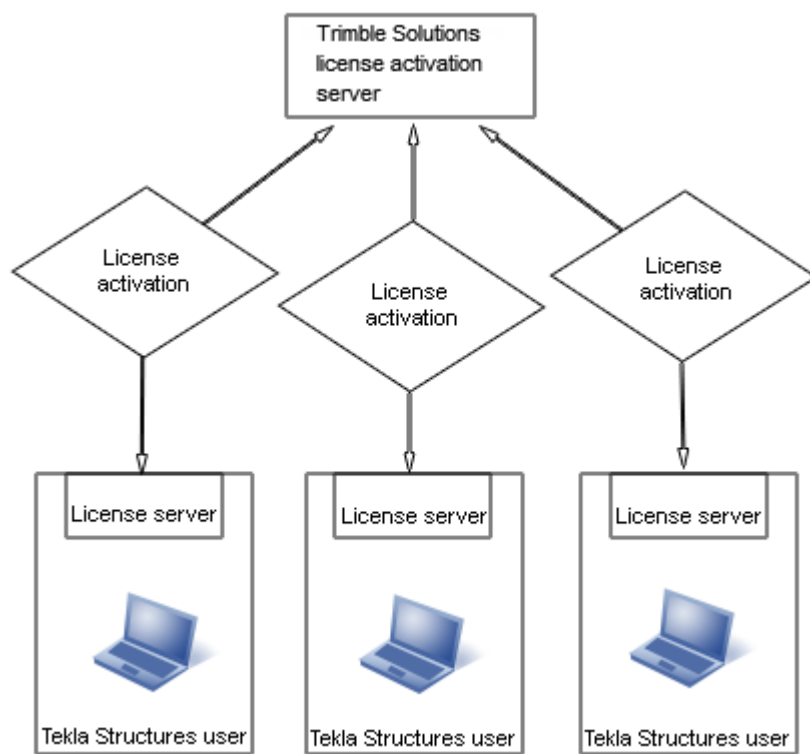
Example 3: Ten Tekla Structures users, necessary licenses activated on a common license server and one user's computer

There are ten Tekla Structures users in a compan

y.
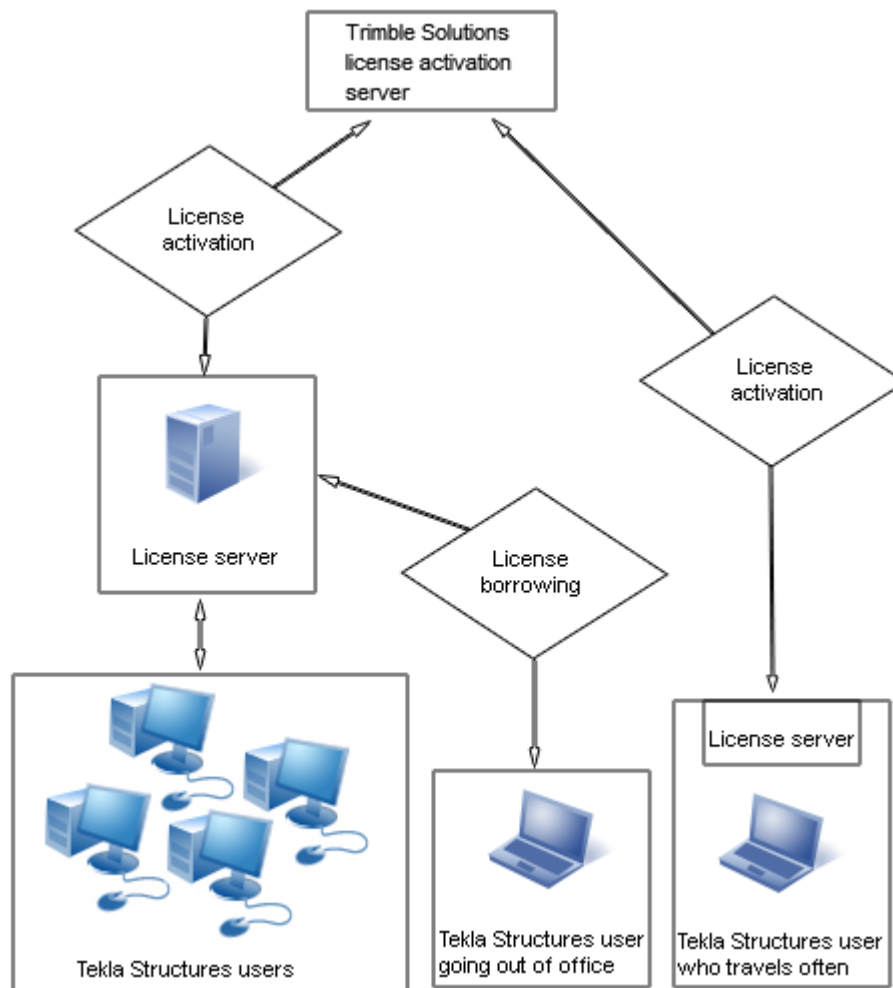
Because the users use different configurations, the company uses a common license server.

- The company has an internal policy for license use containing regulations for managing the licenses.

- One of the main users is assigned as the license server administrator. The administrator installs the license server and informs the other users of the hostname and port number of the server. The license server administrator also performs other server maintenance duties.

- One of the users travels a lot and needs Tekla Structures on the journeys. A license server is installed separately on the user's computer, so the user does not need to borrow a license or use a VPN connection for offline use of Tekla Structures.

- Other users borrow licenses from the license server when they need to use Tekla Structures offline.

Example 4: Fifty Tekla Structures users in two offices, necessary licenses activated on two separate servers

There are fifty Tekla Structures users in two separate offices. Both offices have their own license servers.

• Both offices have assigned license server administrators. The license server administrators install the license servers and perform license server maintenance duties.

• The company has an internal policy for using licenses. The policy contains, for example, the rules that define who is allowed to borrow licenses.

• Because the amount of Tekla Structures users is large, the license server administrators create `tekla.opt` options files for controlling the access rights for different licenses.

• Only a couple of users need to use Tekla Structures offline. The license server administrators modify the option files to enable the license borrowing only for those users who need to borrow licenses.

• If one server fails, the users can connect to the license server at the other office. If there are licenses available on the license server, the users can use the licenses.

Trimble Solutions license activation server

License activation

License activation

License server at office one

License server at office two

Tekla Structures users at office one

Tekla Structures users at office two
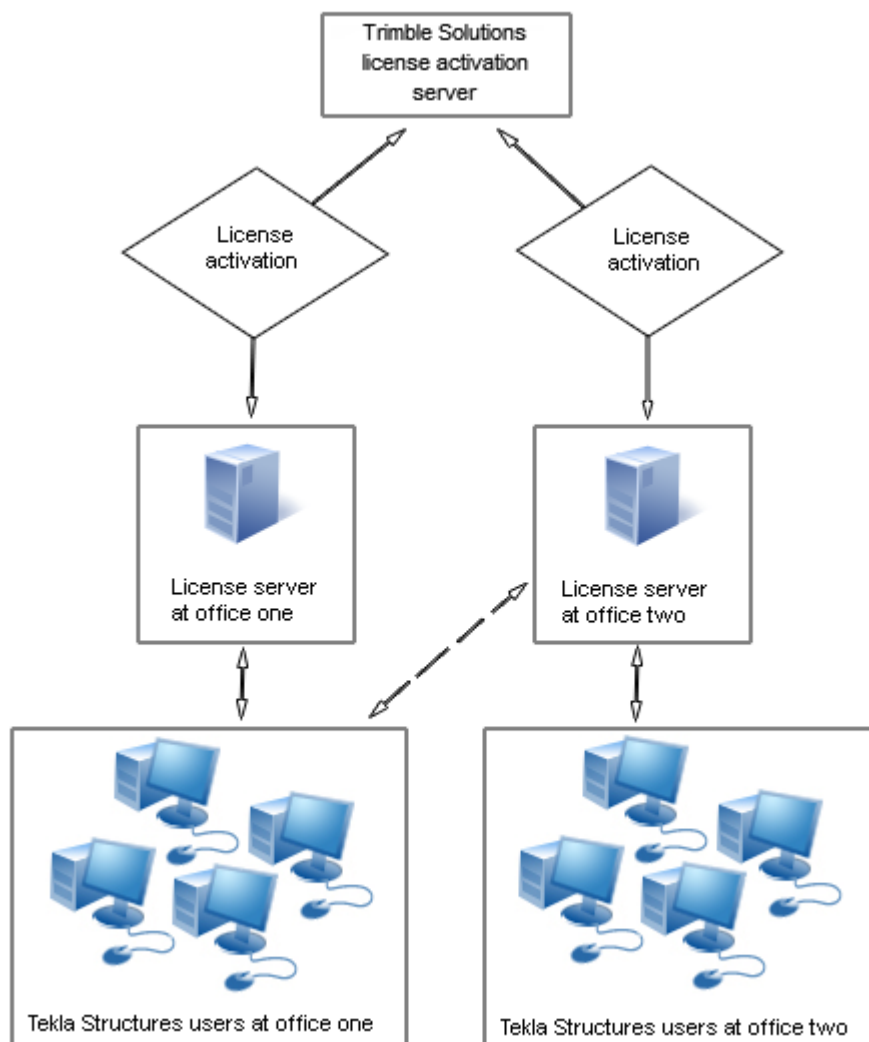
3.2 Installing Tekla license server

The Tekla license server installation package contains license server files, applications for license management and guides. To install the license server software, download the license server installation package with the latest updates from Tekla Downloads product download service.

You have two choices in installation:

- **Automatic default installation:** Select automatic installation for normal setup. Automatic installation is recommended.

  For detailed installation instructions, see Install Tekla license server - automatic installation (page 44).

- **Manual installation:** Use manual installation if you need to separately install the license server, modify the license file, configure the license service, and start the server software. This is needed if you want to use another TCP/IP port than the one used in the automatic installation, for example. Use manual installation only if you are an advanced user of FlexNet or FlexIm licensing.

  For detailed installation instructions, see Install Tekla license server - manual installation (page 45).

Before installing Tekla license server

- Install the license server using administrator's rights.

- Turn off the internal firewall and pause the antispyware/antivirus protection.

- Ensure that you have access to the Internet. The Internet connection is needed during the license activation process. An unreliable connection speed may cause errors.

- If you are using other FlexNet licensing services, you need to stop them before you install the Tekla license server. When you have completed installing the Tekla license server, you can restart the other licensing services.

See also

Problems in Tekla license server installation and connecting to the license server (page 79)

Activate Tekla licenses (page 62)

Allowing Tekla license server to operate through Windows Firewall (page 51)

Which license server version to use

Check the table below to see which license server version to use with your current Tekla Structures version. Also check if you need to upgrade to a new service pack or progress release.

For information about updating the license server, see Update the Tekla license server.

Tekla Structures version	License Server 2016 SP1	License Server 2017 or later
2018 or later		✓
2017i - all versions		✓
2017 - all versions	✓	✓
2016i - all versions	✓	✓

Tekla Structures version	License Server 2016 SP1	License Server 2017 or later
2016 SP5/PR5 or later	✓	✓
2016 up to SP4/PR4	✓	Upgrade to 2016 SP5/PR5 or later
21.1 SR7 or later	✓	✓
21.1 up to SR6	✓	Upgrade to 21.1 SR7 or later
21.1 all PV versions	✓	✓
21.0 or earlier	✓	✓

For instructions on how to install the license server, see .

Install Tekla license server - automatic installation

Before you start license server installation, stop FlexNet licensing services and other licensing services.

For more information about which license server version to use, see Hardware recommendations for Tekla 2020 license server.

To install the default setup of the Tekla license server to a computer that does not have a previous version of Tekla license server installed:

1. Download the license server installation package with the latest updates from Tekla Downloads product download service.

2. Select the installation language.

3. Select **Automatic** as the licensing service installation type to install the default setup.

4. Select the folder where you want to install the license server and complete the installation.

Tekla license server is installed.

In automatic license server installation, the license server address is automatically set to 27007@your_hostname, where 27007 is the port and your_hostname is the computer name/hostname. 27007@your_hostname is used as the license server address in every Tekla Structures installation.

When you have installed the license server, you need to do the following:

• Save the entitlement certificate and activate the licenses. For more information, see Activate Tekla licenses using automatic server notification.

• Connect Tekla Structures to the license server. For more information, see Preconfigure license server settings for users (page 66).

- You can also change the language of the user interface in Tekla License Administration Tool by opening the tool and clicking **Language**.

See also

Install Tekla license server - manual installation (page 45)

Problems in Tekla license server installation and connecting to the license server (page 79)

Problems in Tekla licensing: Error codes and their descriptions (page 93)

Install Tekla license server - manual installation

Use manual installation if you want to separately install the license server, modify the license file, configure the license server, and start the license server software. In manual installation of Tekla license server, you also install two files: `installanchorservice.exe` and `uninstallanchorservice.exe`. You need these files when you manually install or uninstall FlexNet Licensing Service.
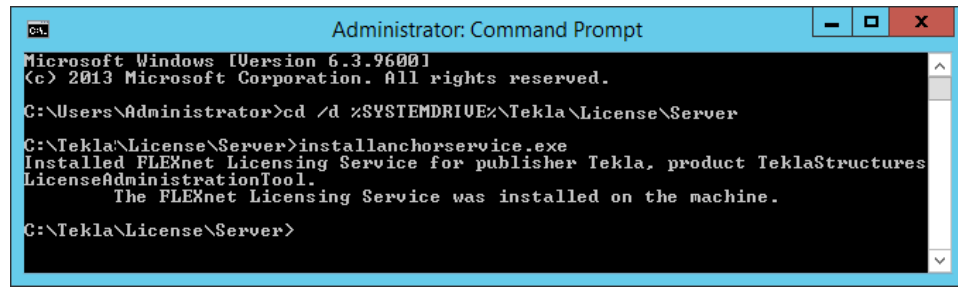
For example, you need to install the license server manually if the default TCP/IP port 27007 is already in use by other services or applications, and you need to define another port in the license file `tekla.lic`.

Before you start license server installation, stop other FlexNet licensing services.

To install the license server manually:

1. Download the license server installation package with the latest updates from Tekla Downloads product download service.

2. Select the installation language.

3. Select **Manual** as the licensing server installation type and complete the installation.

4. Go to the **Start** menu or **Start screen** (depending on your Windows operating system) and open **Command Prompt** as administrator.

5. At the command prompt, enter the following commands:

    a. `cd /d %SYSTEMDRIVE%\Tekla\License\Server`

    b. `installanchorservice.exe`

The licensing server is installed.

6. Modify the license file to include the hostname or IP address of the server, and the correct TCP/IP port:

a. Open the `..\Tekla\License\Server` folder on the server computer.

b. Open the `tekla.lic` (license file) file with a text editor.

c. Replace text `localhost` on the line `SERVER localhost ANY` with the hostname (computer name) or IP address of the license server.

d. Enter the TCP/IP port number after text `SERVER server_hostname ANY`.

e. Save the changes and close the text editor.

7. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.

8. On the **Service/License File** tab, click **Configuration using Services**.

9. On the **Config Services** tab to configure the licensing service:

a. In the **Service Name** box, enter the name of the service exactly as follows: `Tekla Licensing Service`.

b. Click the **Browse** buttons to locate the `lmgrd.exe` (license server manager), `tekla.lic` and `tekla_debug.log` files.

By default, `lmgrd.exe`, `tekla.lic` and `tekla_debug.log` are located in the `C:\Tekla\License\Server` folder.

Note that if you set **Path to the debug log file** outside the `"C:\ProgramData\..."` folder, you get an error message: "Windows preferred path <SystemDrive>\ProgramData to store service data is not set." This error message can be ignored.

c. Select the **Use Services** check box to run the licensing service as a Windows service.

d. Select the **Start Server at Power Up** check box to start the licensing service automatically after Windows startup.

e. Click **Save Service** to save the settings.
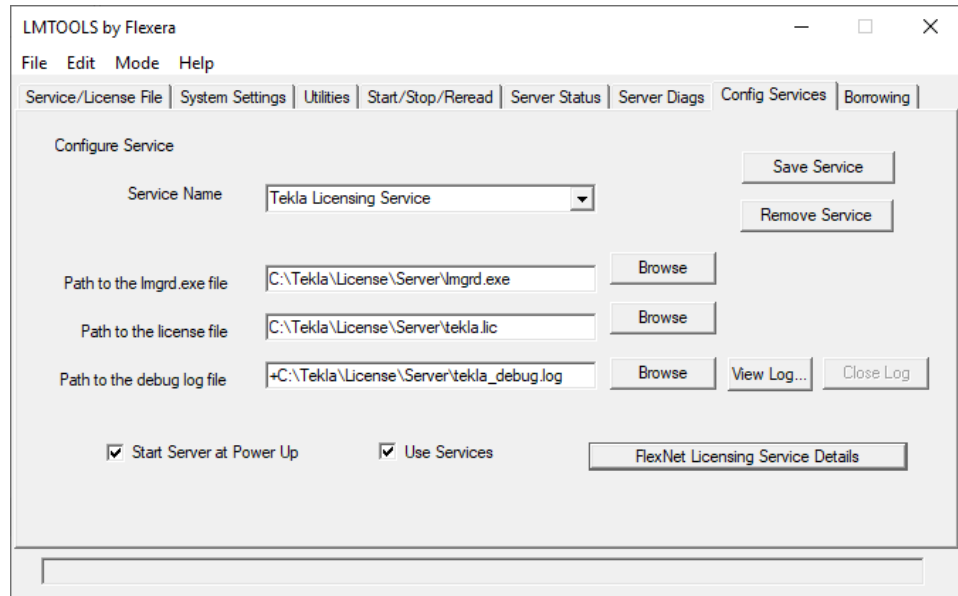
10. Go to the **Start/Stop/Reread** tab and click **Start Server** to start the license server.
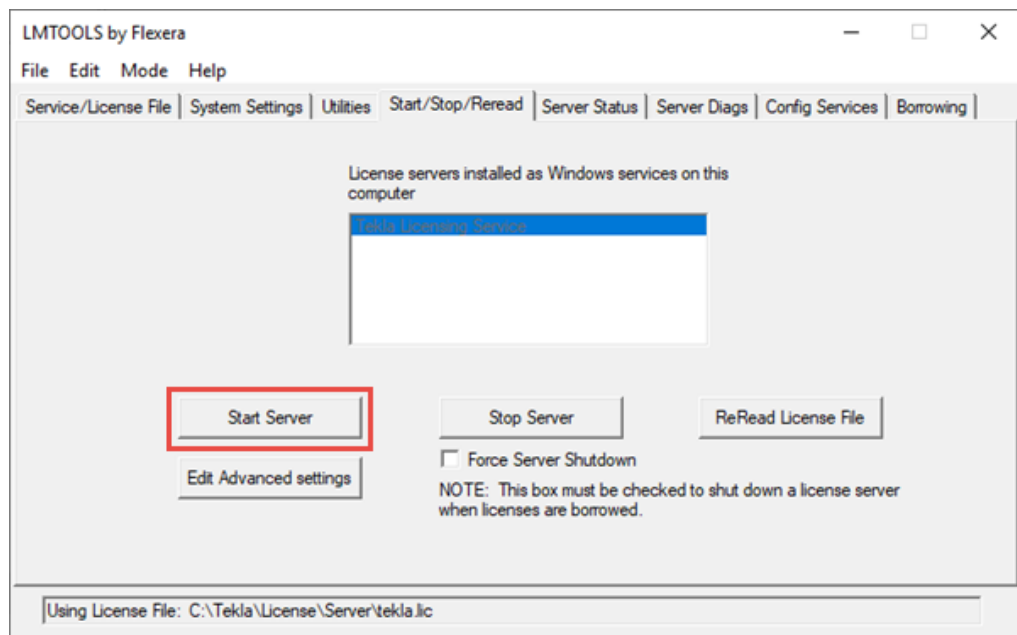
11. Go to the **Server Status** tab and click **Perform Status Enquiry**.

    In the status list, the line `License server status` shows the TCP/IP port and hostname of the license server.

    Now you can activate the licenses and connect Tekla Structures to the license server.

    You can also change the language of the user interface in Tekla License Administration Tool by opening the tool and clicking **Language**.

See also

Modify the license file tekla.lic manually

If you selected the **Automatic** installation option, the license server is set to your hostname: `27007@server_hostname` (`port@hostname`).

The licensing system automatically searches for an available TCP/IP port and uses the first available port detected. The **Automatic** installation sets the port to 27007.

You need to modify the `tekla.lic` license file if you:

- Select the **Manual** license server installation option
- Want to change the TCP/IP port of the licensing server
- Want to use the IP address of your computer instead of the hostname

To modify the license file `tekla.lic` manually:

1. Go to the `..\Tekla\License\Server` folder on the server computer.
2. Open the `tekla.lic` file in a text editor.
3. Make the necessary changes:

   - To use hostname or IP address: Replace text on the first line between words `SERVER` and `ANY` with the hostname or IP address of your license server.
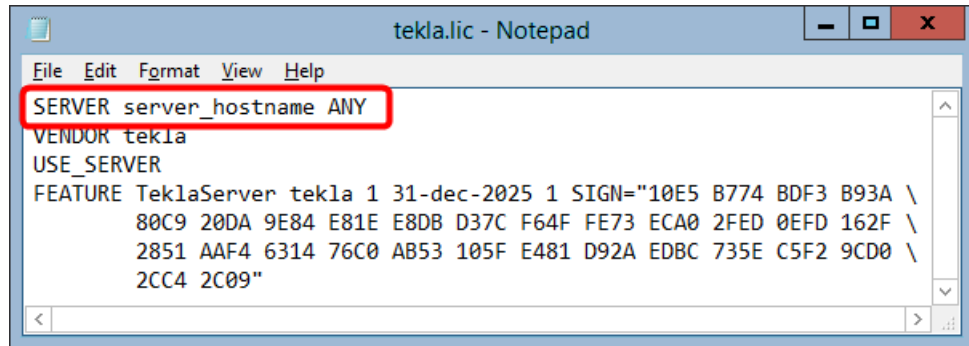
     Do not delete texts `SERVER` and `ANY` when you enter the hostname or IP address of the license server.

     The following formats are valid:

     Hostname:`server_hostname`

     Domain name: `server_hostname.mycompany.com`

     IP address: `10.0.0.12`

You can check the hostname of the license server in **LMTOOLS** on the **System Settings** tab. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.

- To set the TCP/IP port manually: Enter the TCP/IP port number **after** text `SERVER server_hostname ANY`.

  The port number can be any free port in the range of 0 - 64000.

4. Save the changes and close the text editor.

5. Restart the Tekla Licensing Service in **LMTOOLS** or Windows Services for the changes to take effect.

See also

Install Tekla license server - manual installation (page 45)

Configure Tekla license server manually

If you encounter problems during the Tekla license server installation, the license server may not start automatically. If this happens, you need to configure the license server manually using **LMTOOLS**.

To configure the Tekla license server manually:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system. Start **LMTOOLS** with administrators rights.

2. Go to the **Service/License File** tab and select **Configuration using Services**.

3. Go to the **Config Services** tab and do the following:

   Service Name: Select the licensing service. When working with Tekla license server, always select Tekla Licensing Service.

   Path to the lmgrd.exe: Click **Browse** and locate `lmgrd.exe`. This file is by default located in the `C:\Tekla\License\Server` folder.

   Path to the license exe: Click **Browse** and locate `tekla.lic`. This file is by default located in the `C:\Tekla\License\Server` folder.

   Path to the debug log file: Click **Browse** and locate `tekla_debug.log`.

   This file is by default located in the `C:\Tekla\License\Server` folder.

   To append the logging entries in the debug log file, start the debug log file name path with the plus sign (+), like by default for `tekla_debug.log`. If the plus sign is missing, the log file will be rewritten each time the service is started.

   Note that if you set **Path to the debug log file** outside the `"C:\ProgramData\..."` folder, you get an error message: "Windows preferred path <SystemDrive>\ProgramData to store service data is not set." This error message can be ignored.

   Use Services: Select the check box to run the licensing service as a Windows service.

   Start Server at Power Up: Select the check box to start the licensing service automatically after Windows startup.

4. Click the **Save Service** button to save the settings.

5. Go to the **Utilities** tab and do the following:

   Vendor Name: Enter `tekla` (all letters lowercase).

   Path: Enter the name of the license server.

   • If you run the license server and Tekla Structures on the same computer, enter `@localhost`. You can also enter the TCP/IP port, for example, `27007@localhost`.

- If you run the license server and Tekla Structures on separate computers, enter the hostname of the license server, for example, `@server_hostname`.

- You can also enter the TCP/IP port of the license server, for example, `27007@server_hostname`. You must define the port if you use another port than the default port.

- You can also enter several license servers. Separate the server names with a semicolon. For example, `27007@server_hostname;27007@localhost`.

6. Click the **Override Path** button to replace the existing license servers displayed in the status list on the **Server Status** tab.

7. Go to the **Start/Stop/Reread** tab and start the license server by clicking **Start Server**.

   The status bar should display a message telling that server start was successful.

8. Go to the **Server Status** tab and enquire the license server status by clicking **Perform Status Enquiry**.

The status list displays the TCP/IP port and hostname of the license server. The list should indicate that license server is up and vendor daemon `tekla` is up. The list also displays all the activated licenses on the server.

See also

3.3 Allowing Tekla license server to operate through Windows Firewall

When you set up Tekla license server in your network, you may also need to configure the firewall and antivirus settings:

- You need to allow the applications `tekla.exe` and `lmgrd.exe` to operate through the firewall on the license servers and on the client computers.

- The internal firewall at your company must allow the communication between the license server computer and the computers with Tekla Structures.

- In addition to allowing the exceptions in your actual firewall, you may need to configure exceptions for Windows Firewall. Windows Firewall may be set on without you being aware of it, because some Windows updates may automatically turn on the Windows Firewall.

For instructions on how to modify the firewall settings so that the Windows Firewall on the license server allows licensing traffic, see:

-
-

In addition to Windows Firewall, the information given also applies to firewalls from other vendors.

Allow exceptions in firewall for lmgrd.exe and tekla.exe: Windows 7, 8, 8.1, 10 and Windows Server 2012

You need to allow the applications `tekla.exe` and `lmgrd.exe` to operate through the firewall on the license server computer to enable licensing traffic. The instructions below apply to Windows 7, 8, 8.1, 10 and Windows Server 2012.

To allow exceptions for `lmgrd.exe` and `tekla.exe` on the license server computer:

1. Press the **Windows logo key + R** on your keyboard to show the **Run** dialog box, then type `firewall.cpl` and press **Enter**.

2. In the left pane, click **Allow a program or feature through Windows Firewall** or **Allow an app or feature through Windows Firewall** (depending on the operating system).

3. In **Allowed programs** or **Allowed apps** (depending on the operating system), click **Change settings**.

   Administrator permission is required. If you're prompted for an administrator password or confirmation, enter the password or confirm.

4. Click **Allow another program** or **Allow another app** (depending on the operating system).

5. Click **Browse** to browse for the `\Server` folder on the computer, select `lmgrd.exe` and click **Open**.

   By default, the path is `...\Tekla\License\Server`.

6. Click **Add** to add `lmgrd.exe` to the **Allowed programs** or **Allowed apps** and features list (depending on the operating system).

7. Select both **Home/Work (Private)** or **Private** (depending on the operating system) and **Public** check boxes next to `lmgrd.exe`.

8. Allow the exceptions also for `tekla.exe` by repeating the steps 4 – 7.

9. Click **OK** to confirm the changes.

See also

Allow traffic in fixed TCP/IP ports: Windows 7, 8, 8.1, 10 and Windows Server 2012
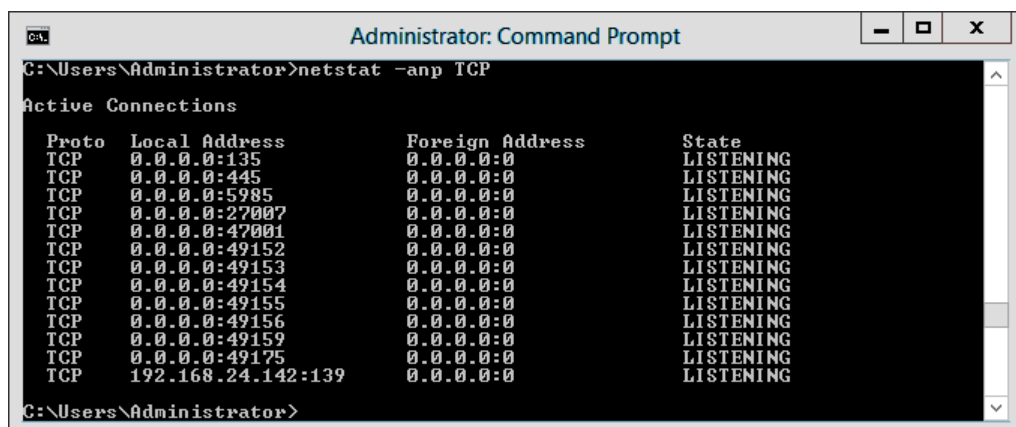
You need to modify the firewall settings to allow traffic through fixed TCP/IP port. The following instructions apply to Windows 7, 8, 8.1, 10 and Windows Server 2012.

To allow traffic in fixed TCP/IP ports in Windows 7, 8, 8.1, 10 and Windows Server 2012 on the license server computer:

1. Ensure that no other software or service is using the ports that you are about to set fixed.

   Use the command line command `netstat -anp TCP` to find out which ports are in use.

   The numbers in the **Local Address** column after the colon (:) are the port numbers that are in use.
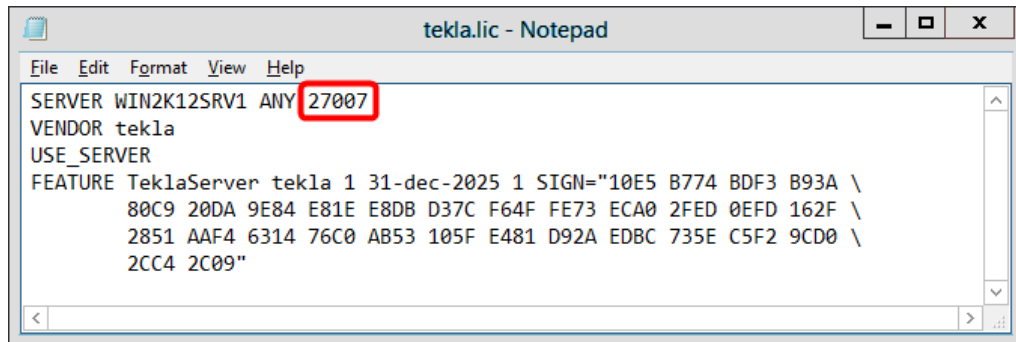
2. Browse for `tekla.lic`, and open it using a text editor.

   By default, the path is `..\Tekla\License\Server`.

3. To set a fixed port for `lmgrd.exe`, enter the TCP/IP port number at the end of the `SERVER` row.

The **Automatic** installation option sets the port to 27007.

```
tekla.lic - Notepad

File   Edit   Format   View   Help

SERVER WIN2K12SRV1 ANY 27007
VENDOR tekla
USE_SERVER
FEATURE TeklaServer tekla 1 31-dec-2025 1 SIGN="10E5 B774 BDF3 B93A \
        80C9 20DA 9E84 E81E E8DB D37C F64F FE73 ECA0 2FED 0EFD 162F \
        2851 AAF4 6314 76C0 AB53 105F E481 D92A EDBC 735E C5F2 9CD0 \
        2CC4 2C09"
```
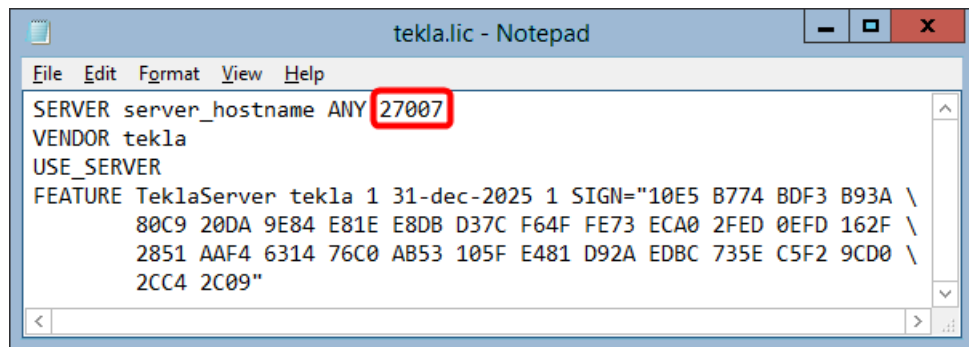
4.   Enter the text `port=free_port` at the end of the `VENDOR` row, for example, `port=1234`.

```
tekla.lic - Notepad

File   Edit   Format   View   Help

SERVER WIN2K12SRV1 ANY 27007
VENDOR tekla port=1234
USE_SERVER
FEATURE TeklaServer tekla 1 31-dec-2025 1 SIGN="10E5 B774 BDF3 B93A \
        80C9 20DA 9E84 E81E E8DB D37C F64F FE73 ECA0 2FED 0EFD 162F \
        2851 AAF4 6314 76C0 AB53 105F E481 D92A EDBC 735E C5F2 9CD0 \
        2CC4 2C09"
```

Defining the TCP/IP port number on the `VENDOR` row may slow down the restart time of Tekla Licensing Service.

5.   Save the changes and close `tekla.lic`.

6.   Update your license server with the changes:

   a.   Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.

   b.   On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.
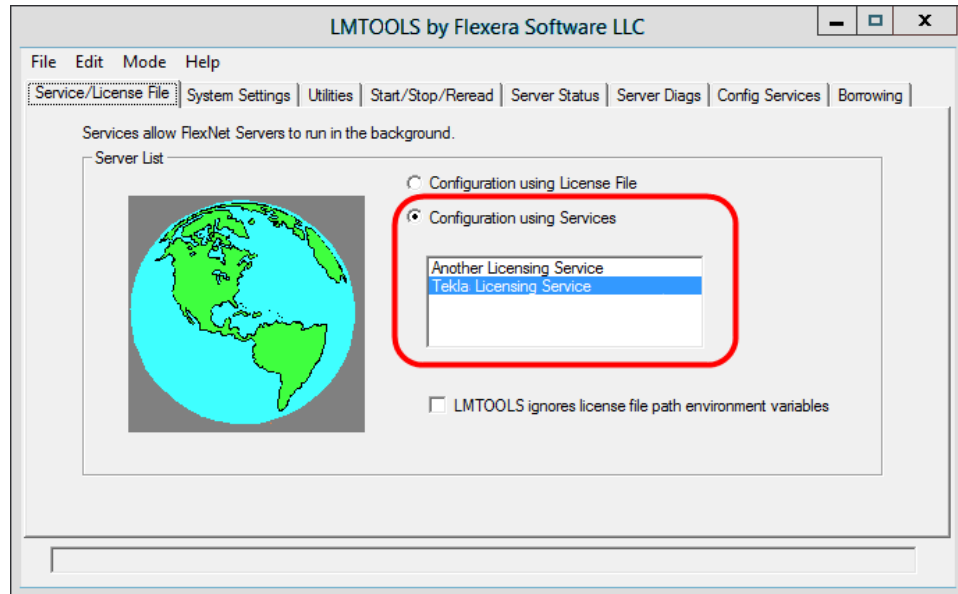
c. Go to the **Start/Stop/Reread** tab and click **Stop Server** to stop the license server, and then start the server again by clicking **Start Server**.

7. Click the Windows logo key on your keyboard to show the **Start** menu or **Start screen**, depending on the operating system.

8. Type `wf.msc` and press **Enter**. The **Windows Firewall with Advance Security** MMS snap-in is displayed.

9. In the navigation tree, select **Inbound Rule**, and then in the **Actions** pane, click **New Rule**.
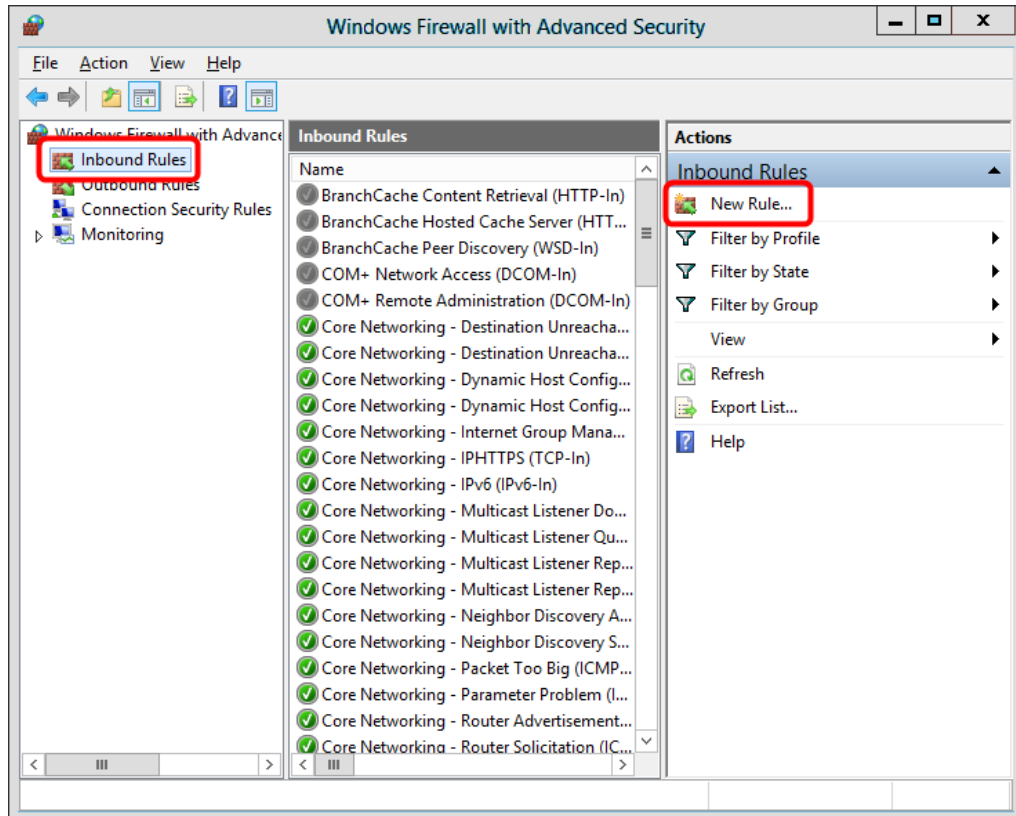
10. On the **Rule type** panel, select **Port** and then click **Next**.
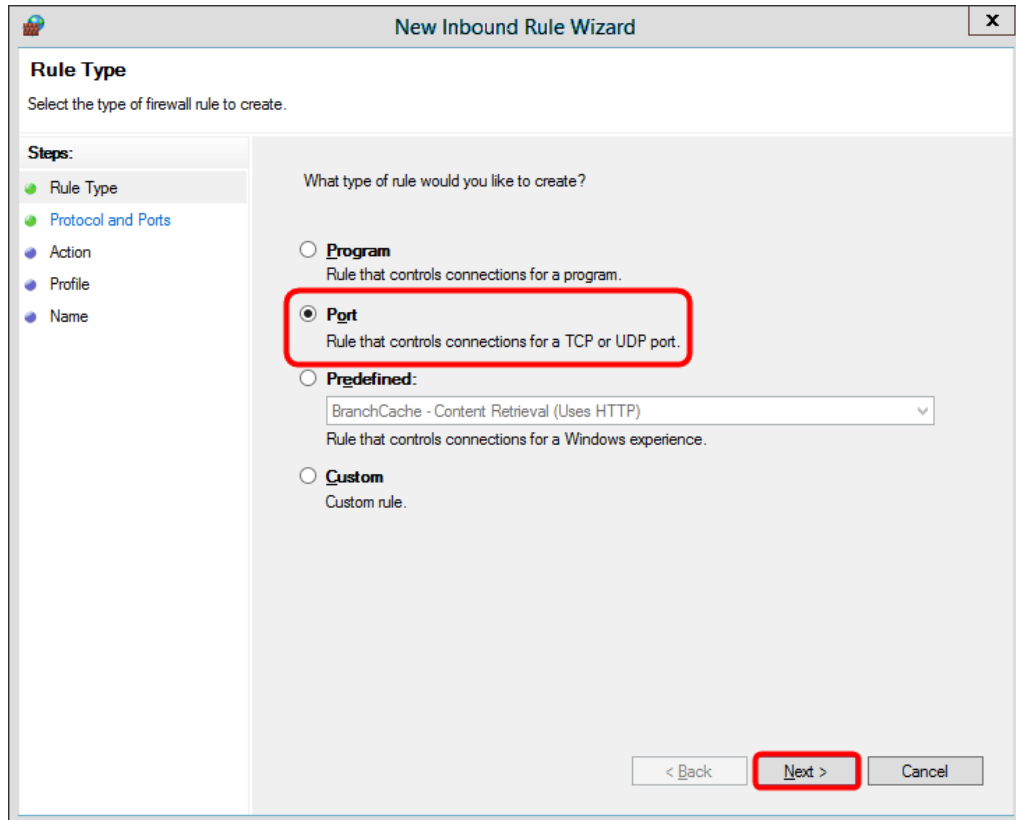
11. On the **Protocol and Ports** panel, select **TCP**, enter the TCP/IP port numbers that you set in steps 3 and 4 in **Specific local ports**, and then click **Next**.

12. On the **Action** panel, select **Allow the connection**, and then click **Next**.
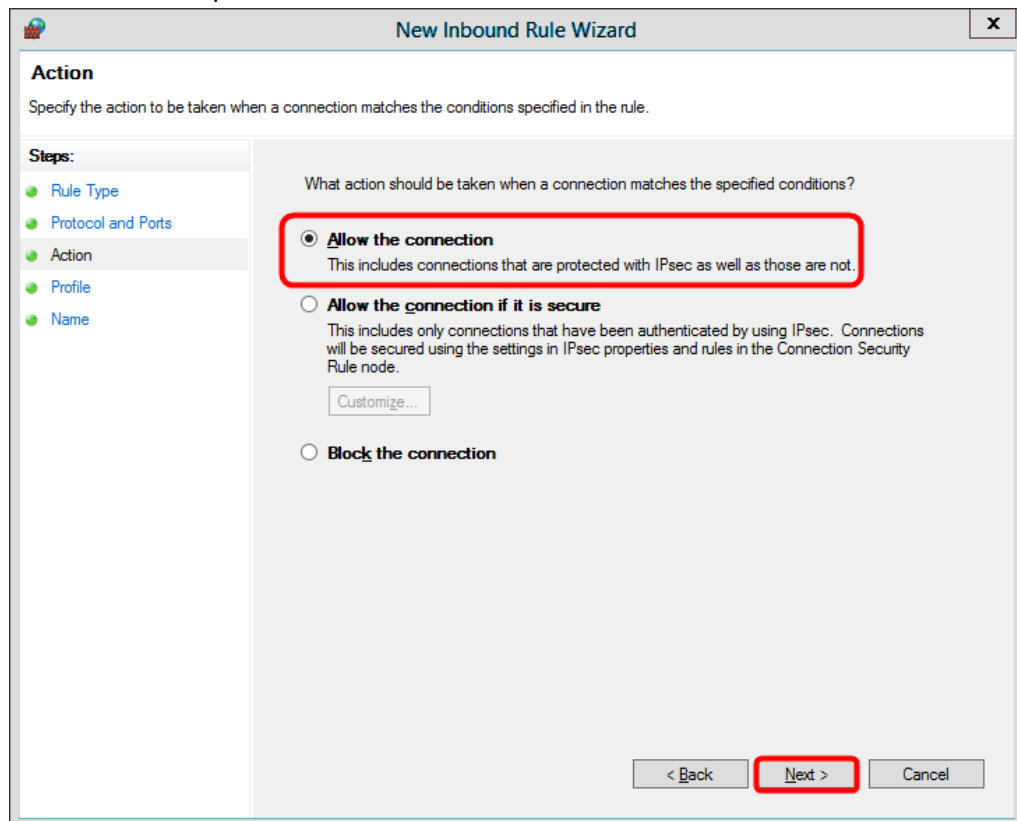
13. On the **Profile** panel, select the appropriate profiles, and then click **Next**.
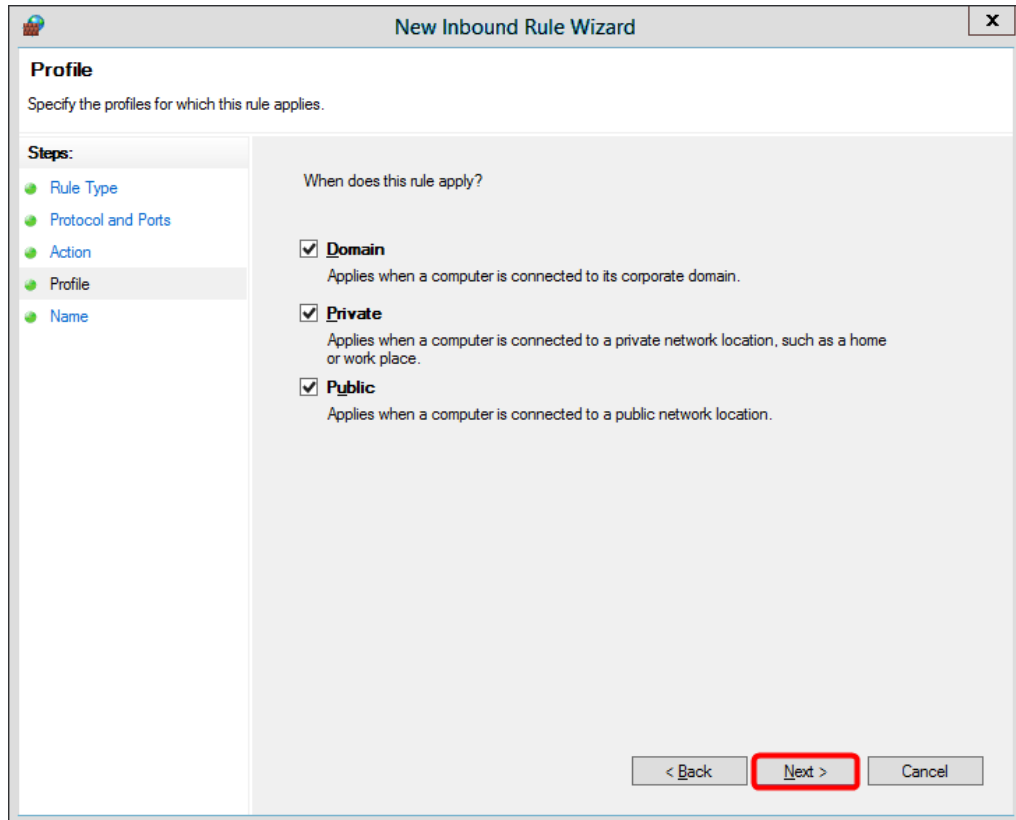
14. On the **Name** panel, enter the name of the rule, and then click **Finish**.

The rule is created and automatically enabled.
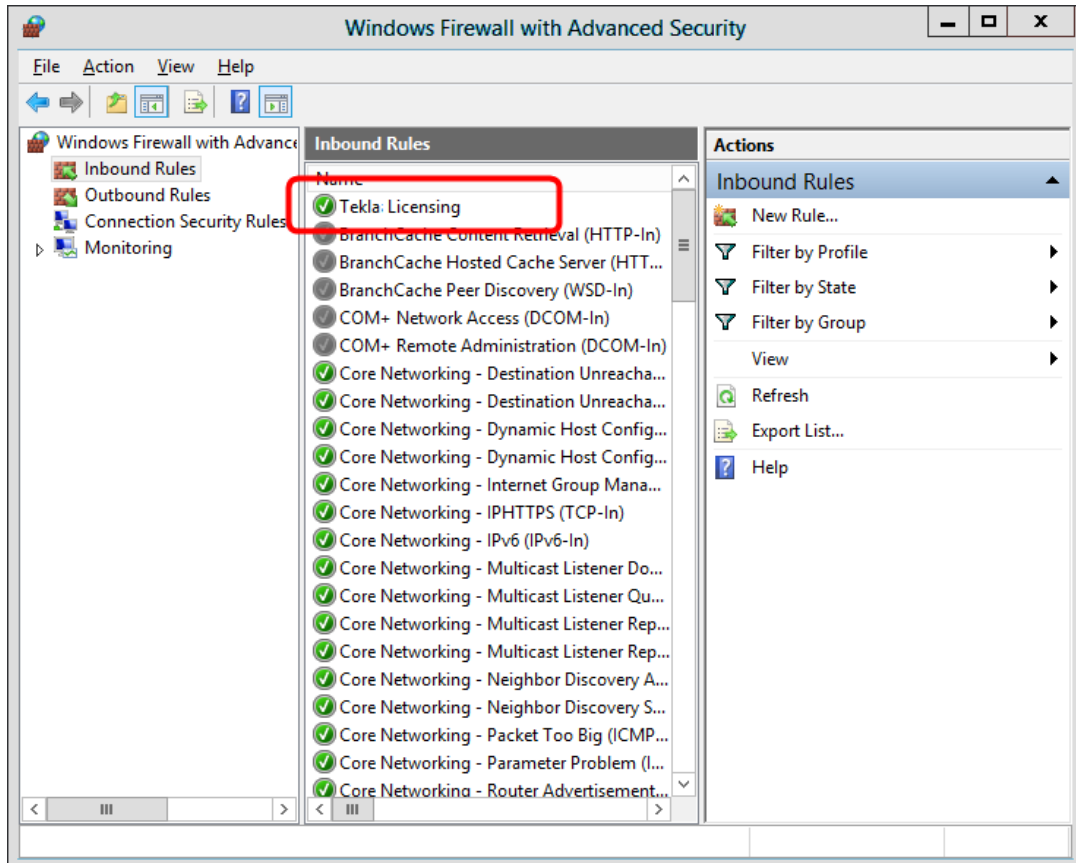
Tekla Structures

Allow exceptions in firewall for lmgrd.exe and tekla.exe: Windows 7, 8, 8.1, 10 and Windows Server 2012 (page 52)

Allowing Tekla license server to operate through Windows Firewall (page 51)

3.4 Activate Tekla licenses

You need to activate the licenses on the license server to be able to use them. There is no activation for online licenses (such as licenses for Tekla Model Sharing).

How license activation works

When you activate the licenses, your license server contacts the activation server at Trimble Solutions, and the license rights are transferred to the license server in your company network or on your computer. You can activate

licenses in Tekla License Administration Tool, which is installed together with the license server.

- Internet access is required in license activation because the license server at your company needs to contact the activation server at Trimble Solutions.

- The activation server at Trimble Solutions tracks the activation status of your licenses. You are not allowed to activate any version of the same license again without first deactivating it. Deactivate the licenses before you make any major changes to the computer that runs the Tekla license server.

- You do not need to activate all the licences at once. You can activate part of the licenses now and part of the licenses later on some other computer, for example. Different configurations and different versions need to be selected for activation separately.

Activate licenses

To activate a license, you must have the corresponding license entitlement certificate file `EntitlementCertificate.html`. The entitlement certificate is sent in an e-mail to the person in your organization who has made the license purchase, or to someone they have named as the contact person. The entitlement certificate states the configurations, quantities and identifiers of the licenses you are entitled to use.

- We recommend that you save the entitlement certificate file `EntitlementCertificate.html` to the `..\Tekla\License\Server` folder. You will need the file again if you later need to move the licenses to a different computer.

  If you have licenses in several entitlement files, rename the files as necessary to avoid overwriting.

- You can activate licenses using either **manual** or **automatic** server notification. Do not use automatic notification if you are using some other FlexNet license and license server administration tool, such as FlexNet Manager. Otherwise, we recommend using automatic notification. You can find the instructions for both procedures below.

Activate Tekla licenses using automatic server notification

You can activate Tekla Structures licenses in Tekla License Administration Tool, which is included in the license server installation. To activate the license, the license server at your company contacts the activation server at Trimble Solutions through the internet.

NOTE Do not use automatic notification if you are using some other FlexNet license and license server administration tool, such as FlexNet

Manager. To notify the license server about license changes manually, see Activate Tekla licenses (page 62).

To activate the licenses and notify the license server automatically:

1. Go to **Tekla Licensing** --> **Tekla License Administration Tool** through the **Start** menu or **Start screen**, depending on your Windows operating system.

2. Make sure the automatic license server notification is enabled. Check the status on the **Notify Server** button in the toolbar and click the button if necessary.

3. Click **Open** and open the `EntitlementCertificate.html` file that contains the license. The license information is displayed in the **Entitled Licenses** area.

Entitled Licenses									
Activate	Quantity	Order ID	Activation ID	Description	Configuration	Version	Type	Start Date	Expiration Date
	1	Tekla HQ	04C1-3F1E-5...	FUD-C	Full	20		1.5.2015	31.5.2015
	2	Tekla HQ	4B73-A2E9-...	STD-C	SteelDetailing	20		1.5.2015	31.5.2015

4. Click the **Activate** cell and select the number of licenses to activate.

Entitled Licenses									
Activate	Quantity	Order ID	Activation ID	Description	Configuration	Version	Type	Start Date	Expiration Date
	1	Tekla HQ	04C1-3F1E-5...	FUD-C	Full	20		1.5.2015	31.5.2015
1	2	Tekla HQ	4B73-A2E9-...	STD-C	SteelDetailing	20		1.5.2015	31.5.2015

5. Click the **Activate** button.

   Your license server contacts the license activation server at Trimble Solutions.

- The activated licenses are displayed in the **Activated Licenses** area.

- We recommend that you back up the trusted storage (`..\ProgramData\FLEXnet\`) in a safe place away from the computer running the license server. Backups can help you restore your licenses on the same server if active licenses are accidentally erased.

- When you open Tekla License Administration Tool later on, it detects expired and broken licenses you may have and asks if you want to deactivate or repair them. If you select **Yes**, an automatic deactivation or repair is run.

See also

Problems in Tekla license activation (page 82)

Problems in Tekla licensing: Error codes and their descriptions (page 93)

Activate Tekla licenses using manual server notification

You have to use manual notification if you are using some other FlexNet license and license server administration tool, such as FlexNet Manager.

To activate the licenses and notify the server manually:

1. Go to **Tekla Licensing** --> **Tekla License Administration Tool** through the **Start** menu or **Start screen**, depending on your Windows operating system.

2. Make sure the automatic license server notification is disabled. Check the status on the ![icon] **Notify Server** button in the toolbar and click the button if necessary.

3. Click **Open** and open the `EntitlementCertificate.html` file that contains the license. The license information is displayed in the **Entitled Licenses** area.

Entitled Licenses

Activate	Quantity	Order ID	Activation ID	Description	Configuration	Version	Type	Start Date	Expiration Date
	1	Tekla HQ	04C1-3F1E-5...	FUD-C	Full	20		1.5.2015	31.5.2015
	2	Tekla HQ	4B73-A2E9-...	STD-C	SteelDetailing	20		1.5.2015	31.5.2015

4. Click the **Activate** cell and select the number of licenses to activate.

Entitled Licenses

Activate	Quantity	Order ID	Activation ID	Description	Configuration	Version	Type	Start Date	Expiration Date
	1	Tekla HQ	04C1-3F1E-5...	FUD-C	Full	20		1.5.2015	31.5.2015
1	2	Tekla HQ	4B73-A2E9-...	STD-C	SteelDetailing	20		1.5.2015	31.5.2015

5. Click the **Activate** button.

   Your license server contacts the license activation server at Trimble Solutions.

6. Next, you need to notify the server. This has to be done each time you activate a license.

   a. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.

   b. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.

   c. In the **LMTOOLS** dialog box, go to the **Start/Stop/Reread** tab.

   d. Click **ReRead License File**.

      The license server reads the license information.

• The activated licenses are displayed in the **Activated Licenses** area.

• We recommend that you back up the trusted storage (`..\ProgramData\FLEXnet\`) in a safe place away from the computer running the license server. Backups can help you restore your licenses on the same server if active licenses are accidentally erased.

- When you open Tekla License Administration Tool, it detects expired and broken licenses you may have and asks if you want to repair or deactivate them. If you select **Yes**, an automatic deactivation or repair is run.

See also

Problems in Tekla license activation (page 82)

Problems in Tekla licensing: Error codes and their descriptions (page 93)

3.5 Preconfigure license server settings for users

When the license server is on a separate server in the network, Tekla Structures connects to the license server to fetch a license. To be able to do this, the license server address must be defined on each computer. This can be done by typing in the address when starting the software for the first time or you can include the address in an intialization file that you distribute as part of your customized installation. You can also predefine the license, environment and role with a customized startup shortcut and intialization file.

By default, when Tekla Structures starts for the first time on a computer, the system asks for the address of your Tekla license server unless Tekla Structures can find a license server with an active license installed on the same computer. To avoid this manual process, you can include the Tekla license server address in your customized configuration. Similarly, you can also select the license for the user, and if you also preset the environment and role, the user does not need to make any selections when starting Tekla Structures. To set up this for your users, see the instructions in Implementation guide for administrators (page 107).
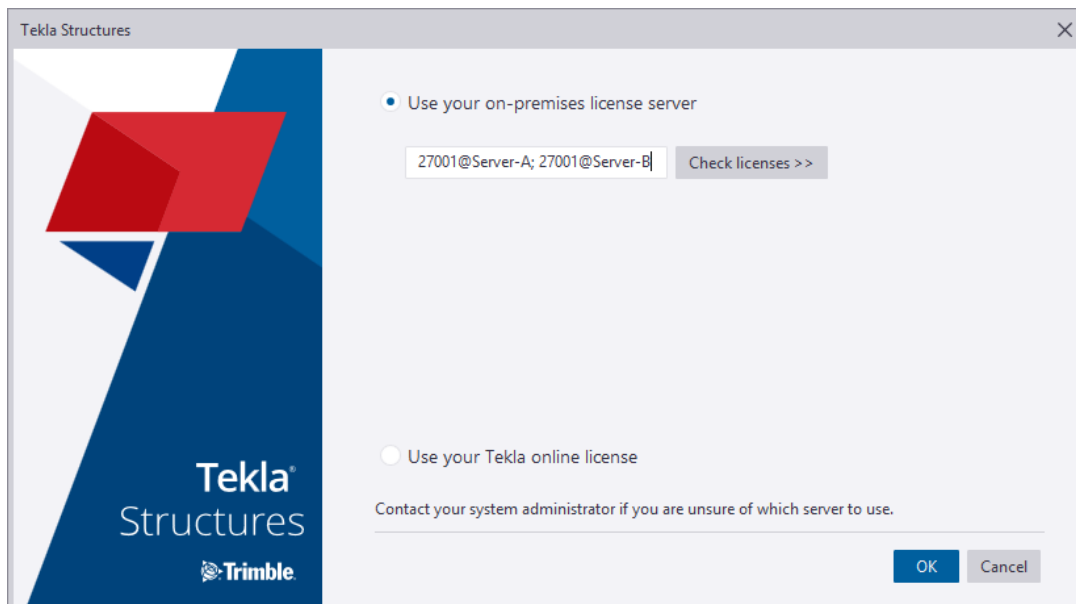
See also

3.6 Deactivate Tekla licenses

License deactivation releases license rights from a license server, which allows you to activate a new version of the same license or to activate the same license on different hardware. There is no deactivation for online licenses (such as licenses for Tekla Model Sharing).

The activation server at Trimble Solutions tracks the activation status of your licenses. You are not allowed to activate any version of the same license again without first deactivating it.

When you deactivate licenses, your license server contacts the activation server at Trimble Solutions, and the license rights are transferred away from your Tekla license server.

When you need to deactivate licenses

- Before you upgrade or reinstall the operating system or before you change the hardware components of any computer that has a license server installation with active licenses.

- Before you activate a replacement license, including licenses that entitle you to run a new version of Tekla Structures and replacement licenses for any temporary licenses.

- Before you activate the same license on a different license server, for example, when you want to change from one license server computer to another.

- Before you change the IP address on the license server computer.

- Before you format the hard drive of or decommission your server computer.

When you do not need to deactivate licenses

You do not need to deactivate licenses before uninstalling and reinstalling the Tekla license server software.

Deactivate licenses

- Internet access is required in license deactivation.

- Deactivation must be done on the license server containing the active license. If your license server fails and cannot be recovered, contact your local support for assistance.

To deactivate licenses:

1. Start the Tekla License Administration Tool app with administrator rights. This tool is installed together with the Tekla license server and you can find it through the Windows **Start** menu on the computer that is hosting your license server.

2. In the **Tekla License Administration Tool** dialog box, go to the **Statistic** tab and ensure that no one is using the licenses.

License server statistics					
Configuration	Description	Total	In Use	Borrowed	Free
SteelDetailing	STD-C	1	0	0	1

> **NOTE** Before you deactivate licenses, ensure that the licenses are not in use or borrowed. The borrowed licenses must be returned before they can be deactivated.

3. If you have not activated the automatic server notifications (the **Notify Server** option in **Tekla License Administration Tool**), you need to stop the license server manually in **LMTOOLS**:

   a. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system. Start **LMTOOLS** with administrator rights.

   b. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.

   c. Go to the **Start/Stop/Reread** tab and click **Stop Server**.

4. In **Tekla License Administration Tool**, go to the **Licenses** tab.

   The **Activated Licenses** area lists the active licenses.

	Deactivate	Trust Status	Enabled	Quantity	Borrowed	Configuration	Version	Expiration Date	Type	Activation ID	Order ID
▶	☐	🔒🔑🔄	✓	1	0	SteelDetailing	20	31.5.2015	Enter...	4B73-A2E9-...	Tekla HQ

Activated Licenses

5. Select the **Deactivate** check box to select the license for deactivation.

   If you activated more than one license of the same type in one go, you cannot deactivate those licenses one by one, but you need to deactivate all of the licenses in one go.

6. The **Deactivate** button is activated, click it.

The license server contacts the activation server at Trimble Solutions. Internet access is required at this stage. After a successful deactivation you will see the

license successfully deactivated message, and the **Tekla License Administration Tool** is updated to reflect the deactivation.

See also

Problems in Tekla license deactivation (page 86)

Problems in Tekla licensing: Error codes and their descriptions (page 93)

3.7 Maintain Tekla licenses

After the licensing is set up, you can verify that you have the correct number of licenses and that the licenses are used correctly by monitoring the license use (page 69).

You need to make changes in the following situations:

- If users are selecting incorrect license types or secondary users are reserving too many licenses, you can ensure that the correct types of licenses are available to the users who most need them by defining access rights for using and borrowing licenses, see Modify Tekla license access rights (tekla.opt) (page 71).

- You need to deactivate your existing licenses (page 67):

  - When you start using a new version of Tekla Structures, which requires activating renewed licenses.

  - Before you activate a changed version of the same license (for example, the number of concurrent users is changed).

  - Before you make hardware changes that affect the license server.

  - If you want to move the licenses to a different license server (page 75).

- If your licenses become untrusted or disabled, you can repair them a limited number of times as explained in Repair a license (page 76).

See also

Troubleshoot Tekla licensing (page 77)

Monitor Tekla license use

You can get a report of how many Tekla Structures licenses are currently in use in your company with the **LMTOOLS** software that is delivered with the Tekla license server.

The LMTOOLS application requires Windows administrator privileges to run.

To view which licenses are currently in use:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.

2. If the correct Tekla license server is not defined, switch to the **Utilities** tab and add the license server path:

    a. Type `tekla` in the **Vendor Name** box.

    b. Type your license server address as `port@host` in the **Path** box.

    c. Click **Override Path**.
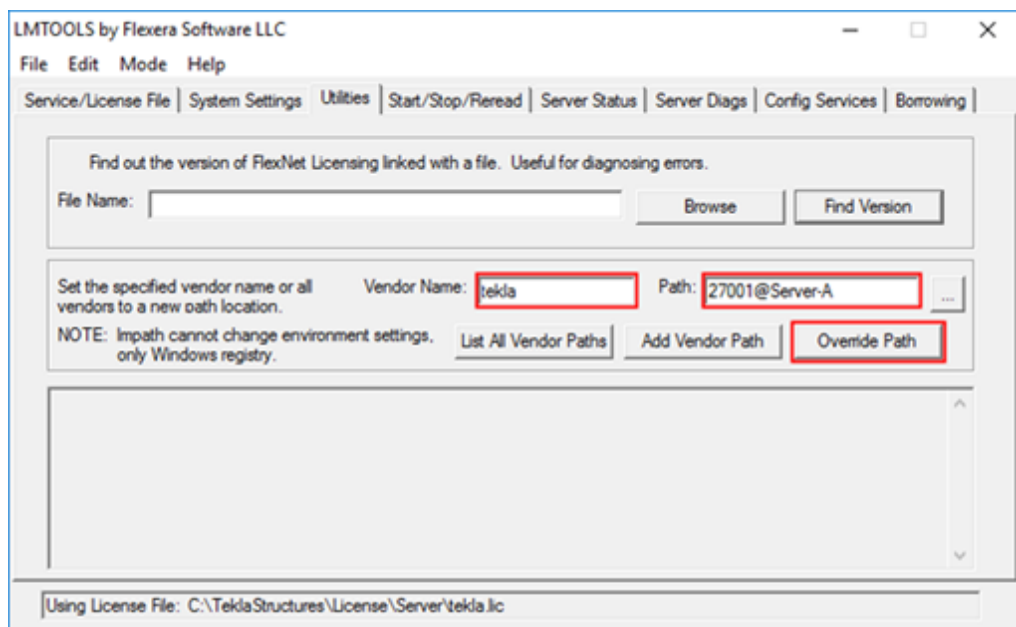
3. On the **Server Status** tab, click **Perform Status Enquiry**. You will receive a listing of how many licenses and which configurations are activated on the server, and how many of the licenses are in use at the moment of enquiry.

    The status enquiry uses abbreviations of Tekla Structures configurations, which are explained here (page 72). You can also find the description of the abbreviations in your entitlement certificate or in Tekla License Administration Tool.

    For a comprehensive description of the status enquiry syntax, see .

Modify Tekla license access rights (tekla.opt)

The license server administrator may grant different users and user groups different rights to use licenses by modifying the `tekla.opt` options file. This can prevent situations where there are no licenses available for users that need them because someone else has reserved or borrowed a license that they do not really need.

The licensing options file `tekla.opt` is located in the `..\Tekla\License\Server` folder.

The most common configuration options include the following:

- You can define the access rights for specific usernames or hostnames/IP addresses either individually or using groups that you define. You can use the same username or hostname in several groups.

- You can **reserve** a number of licenses for a specific configuration (e.g., Steel detailing) for exclusive use by a specific user or user group. If necessary, the users in the group can reserve more licenses than the reserved quota. Other users can only use one of the remaining free licenses outside the reserved quota.

- You can define a maximum (**max**) number of licenses that a user or group can simultaneously use. Users who are not included in this limitation can use any free license.

- You can **include** (allow) a user or group in the exclusive use of all licenses for a specific configuration. Other users are prevented from using the configuration.

- You can **exclude** (disallow) specific users from using any licenses for a specific configuration. All other users are allowed to use the configuration.

- You can include and exclude users from borrowing licenses.

To modify access rights in the `tekla.opt` file:

1. Go to the `..\Tekla\License\Server` folder.

2. Open the `tekla.opt` file in a text editor.

3. Enter your definitions for license access rights and restrictions.

    The definition string consists of the following parts: `[keyword] [Tekla Structures feature] [user type] [name]`

    When you write the definition, follow the rules below.

    - Note that the options file is case sensitive.

    - If you need to define user groups and host groups, define them first.

        Use Windows user names when defining user groups and hostnames or IP addresses when defining host groups.

- Enter one definition per row. A definition consists of the following things:
  - An options keyword that defines the actions.
  - A feature, such as a configuration, that is affected by the keyword.
  - The type that is affected by the keyword.

    The options are: `USER`, `GROUP`, `HOST`, and `HOST_GROUP`.
  - The name of the user, user group, host, or host group that is affected by the keyword.

    You can use the hostnames or IP addresses of the computers with the `HOST` and `HOST_GROUP` keywords.
- To disable a row in the options file, enter `#` in the beginning of the row.

Examples of definitions:

`INCLUDE PCD-C USER scarlett` (Only the user scarlett is allowed to use the **Precast Concrete Detailing** configuration.)

`RESERVE 1 RCD-C USER vera` (One license of the **Rebar Detailing** configuration is reserved for the user vera.)

For details about the allowed keywords and configuration codes together with more examples, Configuration codes and keywords used in access right definitions (page 72).

4. Save the changes and close the text editor.

5. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.

6. In **LMTOOLS**, go to the **Start/Stop/Reread** tab and click the **ReRead License File** button to update the changes in the license file and in the options file.

Useful links

For more information about limiting certain Tekla Structures versions to certain users, see the following Support Article in Tekla User Assistance: How to limit certain Tekla Structures version to certain users

Configuration codes and keywords used in access right definitions

When you define access rights in `tekla.opt`, you need to use correct abbreviations (codes) for the configurations, otherwise the definitions do not work. The access rights are defined using certain keywords.

Configuration codes

When you define access rights for different Tekla Structures configurations in the `tekla.opt` options file, you need to add a proper code for each configuration in the definition.

NOTE The configuration codes are backward compatible, and the codes used for licensing in older Tekla Structures versions still work. However, the commercial product name of the configuration may change between versions. For example, the commercial product name for STDL-C used to be Steel Detailing Limited, but now it is Primary.

The codes for the Tekla Structures configurations are listed below:

Configuration code	Configuration
CM-C	**Construction Modeling**
DEV-C	**Developer**
DFR-C	**Drafter**
EDU-C	**Educational**
FUD-C	**Full**
PCD-C	**Precast Concrete Detailing**
RCD-C	**Rebar Detailing**
SDE-C	**Engineering**
STD-C	**Steel Detailing**
PPC-C	**Production Planner - Concrete**
STDL-C	**Primary**
VIE-C	**Project Viewer**

Most common keywords

The most common keywords that are used for defining license access rights and restrictions in the `tekla.opt` options file are listed and described below:

Keyword	Description	Usage information
EXCLUDE	Prevent access to a Tekla Structures configuration.	Use with the abbreviation of the configuration.
EXCLUDE_ENTITLEMENT	Prevent license borrowing.	Use with the activation ID of the license.
EXCLUDEALL	Prevent access to all Tekla Structures configurations.	
GROUP	Define a user group for use with any options.	Use with Windows user names (separated with spaces).
HOST_GROUP	Define a host group for use with any options.	Use with computer hostnames or IP addresses (separated with spaces).

Keyword	Description	Usage information
INCLUDE	Allow a user to use a Tekla Structures configuration.	Use with the abbreviation of the configuration.
INCLUDE_ENTITLEMENT	Allow a user to borrow a license.	Use with the activation ID of the license.
INCLUDEALL	Allow a user to use all Tekla Structures configurations.	
MAX	Limit the usage of a configuration.	Use with the number of licenses and the abbreviation of the configuration.
RESERVE	Reserve licenses for a user/host or a group of users/hosts.	Use with the number of licenses and the abbreviation of the configuration.

- When somebody is allowed to use a configuration with the INCLUDE keyword, other users are automatically prevented from using the configuration.

- When somebody is denied to use a configuration with the EXCLUDE keyword, other users are automatically allowed to use the configuration.

- If no rules exist, everybody is allowed to use the configuration.

Some examples of definitions in a tekla.opt options file are given below:

Options file definition	Description
INCLUDE PCD-C USER scarlett	Only the user **scarlett** is allowed to use the **Precast Concrete Detailing** configuration.
EXCLUDE FUD-C USER justin	The user **justin** is not allowed to use the **Full** configuration. Other users are allowed to use the **Full** configuration.
GROUP tsusers jessica joe neil INCLUDEALL GROUP tsusers	The users **jessica**, **joe** and **neil** belong to the group **tsusers**. Only the group **tsusers** is allowed to use all configurations.
EXCLUDEALL HOST pcrobert	No configuration is allowed to be used on the computer **pcrobert**.
INCLUDE_ENTITLEMENT qwer-1234-asdf-5678-zx USER gwen	Only the user **gwen** is allowed to borrow a license whose activation ID is **qwer-1234-asdf-5678-zx**.
EXCLUDE_ENTITLEMENT rtyu-9876-fghj-5432-cv USER matt	The user **matt** is not allowed to borrow a license whose activation ID is **rtyu-9876-fghj-5432-cv**.

Options file definition	Description

`GROUP students amy chloe andy dean`
 	
`MAX 3 EDU-C GROUP students`
	The users **amy**, **chloe**, **andy**, and **dean** belong to the group **students**. The limit to the usage of the **Educational** configuration for the group **students** is three licenses.

`RESERVE 1 RCD-C USER vera`	One license of the **Rebar Detailing** configuration is reserved for the user **vera**.

`GROUP STUDENTS user1 user2 user3`
 	
`RESERVE 3 VIE-C GROUP STUDENTS`
	The users **user1 user2 user3** belong to the group **STUDENTS**. **3** licenses of the **Project Viewer** configuration are reserved for the group **STUDENTS**.
	
	STUDENTS is a group name.
	
	user1 - user 3 are Windows user names separated with spaces.
	
	The number **3** is the number of licenses to reserve.
	
	VIE-C is the configuration code for the **Project Viewer** configuration.
	
	Note that any licenses reserved for a group are dedicated to that group. Even when that group is not actively using the licenses, the licenses are unavailable to other users.

`INCLUDE VIE-C:VENDOR_STRING=Enterpris e USER john`	Only the user **john** is allowed to use the **Project Viewer** configuration which is of type **Enterprise**.

Useful links

For more information about limiting certain Tekla Structures versions to certain users, see the following Support Article in Tekla User Assistance: How to limit certain Tekla Structures version to certain users

Move licenses between license servers

You can transfer a license from one license server to another. Moving licenses can be necessary, for example, if you are switching to new hardware or if you want to consolidate licenses from several workstations to a central server.

1. in the Tekla License Administration Tool on the computer that currently contains the licenses.

Activated Licenses

	Deactivate	Trust Status	Enabled	Quantity	Borrowed	Configuration	Version	Expiration Date	Type	Activation ID	Order ID
▶	☐	🔵🔵🔵	✅	1	0	SteelDetailing	20	31.5.2015	Enter...	4B73-A2E9-...	Tekla HQ

2. If the license entitlement certificate file containing these licenses is not available on the other computer, find the `EntitlementCertificate.html` file that contains the license and copy it to the computer on which you want to activate the licenses.

    •   Entitlement certificate files are sent over email. In the installation instructions, we recommend storing the entitlement files in the license server installation folder (`..\Tekla\License\Server\`), from where you can copy it to the same folder on the other computer.

    •   Rename the files as necessary to avoid overwriting different entitlement certificate files with each other.

    •   There can be several licenses in one file, so you can activate different licenses on different computers using the same entitlement certificate file.

3. Activate the licenses (page 62) in the Tekla License Administration Tool on the other computer to complete the move.

Activate	Quantity	Order ID	Activation ID	Description	Configuration	Version	Type	Start Date	Expiration Date
	1	Tekla HQ	04C1-3F1E-5...	FUD-C	Full	20		1.5.2015	31.5.2015
1	2	Tekla HQ	4B73-A2E9-...	STD-C	SteelDetailing	20		1.5.2015	31.5.2015

Entitled Licenses

We recommend that you back up the trusted storage (`..\ProgramData\FLEXnet\`) in a safe place away from the computer running the license server. Backups can help you restore your licenses on the same server if active licenses are accidentally erased.

See also

Installing Tekla license server (page 42)

Repair a license

If your licenses have become untrusted or disabled, they cannot be used and you need to repair them.

The license trust status is indicated in the **Activated Licenses** area in Tekla License Administration Tool. If a trust status symbol is green, the information is trusted, if red, the information is untrusted.

WARNING	Because of technical and security reasons, you can repair an Activation ID only a limited number of times, which at the moment is two times a year. Therefore it is important that you inform your local Tekla Structures representative about the license repairs you have been performing, and keep count of the repairs.

The status can be one of the following:

- A red **H** (**Host**) indicates whether the server has been moved to another computer, or whether the computer hardware has changed radically.

  The **Host** trust status of your license is not trusted:

  Trust Status
  H T R

  NOTE Licenses that have the **Host** trust status untrusted cannot be repaired.

- A red **T** (**Time**) indicates whether the system clock has been tampered with.

  The **Time** trust status of your license is not trusted:

  Trust Status
  H T R

- A red **R** (**Restore**) indicates whether the license is obtained from a backup copy.

  The **Restore** trust status of your license is not trusted:

  Trust Status
  H T R

To repair a license:

1. Go to **Tekla Licensing** --> **Tekla License Administration Tool** through the **Start** menu or **Start screen**, depending on your Windows operating system.

    The **Activated Licenses** area displays the activated licenses.

2. Click **Repair**.

    The license server contacts the activation server at Trimble Solutions. After successful repairing the trust status in Tekla License Administration Tool dialog box is updated.

For more information about the status of the activated licenses in the trusted storage, see instructions in the following Support Articles in Tekla User Assistance:

Checking the status of the activated licenses in the trusted storage

Checking the status of the activated licenses in the trusted storage (including borrowing info)

Troubleshoot Tekla licensing

Click the links below for help in solving problems encountered in the following areas:

For more information about error messages starting with an error code, see .

View and diagnose errors in Tekla Structures license activation, deactivation and borrowing

Tekla License Administration Tool and Tekla License Borrow Tool both give error messages when errors occur. The tools automatically create packages of all necessary files required for diagnosing the errors.

If you have a problem with activating or deactivating licenses, or borrowing or returning licenses, Tekla License Administration Tool and Tekla License Borrow Tool display an error message in the **Activating Licenses(s)**, **Deactivating License(s)**, **Borrowing License(s)** or **Returning Borrowed License(s)** dialog boxes, depending on the subject of the error.

- You can view more detailed information about an error by clicking the **View** button in an error dialog box.

- Tekla License Administration Tool and Tekla License Borrow Tool automatically create zip packages of all necessary files required for diagnosing the errors in the `C:\Tekla\License\Server\Reports` folder and in the `%TEMP%\Tekla License Borrow Tool\Reports` folder. Click **Browse** in the error dialog box to browse for the folder containing the error report package. You can send the package to your local support to get help.

  The error report package contains the following files:

  `tekla_debug.log` - Tekla license server debug log file

`error.txt` - error report, contains error information. The Tekla License Borrow Tool zip package only contains this file.

`tekla.opt` - access rights options file

`tekla.lic` - Tekla license file

See also

Troubleshoot Tekla licensing (page 77)

Problems in Tekla licensing: Error codes and their descriptions (page 93)

Problems in Tekla license server installation and connecting to the license server

⚠️

License server installation fails, and the following message is displayed: "A newer version of this application is already installed on this computer. If you wish to install this version, please uninstall the newer version first. Click OK to exit the wizard."

Reason: You have a newer version the license server installed.

Solution: You should not install an old version of the license server. Check the latest available license server release on the Tekla Downloads product download page.

The license server version is not dependent on Tekla Structures. However, if you need to use an older version of the license server for some reason, uninstall the newer version on your computer before installing the older version.

⚠️

License server installation does not finish (no error message)

Reason: Another software using the FlexNet licensing system is running on the computer.

Solution: Stop all licensing services in **LMTOOLS**, then install the Tekla license server and restart the licensing services you stopped earlier:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.

2. On the **Service/License File** tab, ensure that **Configuration using services** is selected, select a license service from the services list, go to the **Start/Stop/Reread** tab and click **Stop Server**.

   Do the same for all the services you need to stop.

3. Install the Tekla license server.

4. In **LMTOOLS**, start the licensing services you stopped earlier.

⚠️

Problem in license server connection. The following message is displayed: "Error when connecting to the license server. Contact your system administrator or try another server".

Reason: This problem is often related to firewall settings.

Solution: Check that your firewall allows the client to contact the license server.

⚠️

License library initialization failed with error: The licensing service is not installed.

Reason: The error occurs when you are starting Tekla License Administration Tool, or when you are trying to run `serveractutil.exe` command line tool.

Solution: If you selected the **Manual** option for Tekla Licensing Service installation then you need to manually install FLEXnet licensing service:

1. If you have some other FlexNet licensing service running on the server, stop it before entering the commands.

2. Go to the **Start** menu or **Start screen**, depending on your Windows operating system, and open **Command Prompt** as an administrator.

3. At the command prompt, type the following commands:

   `cd /D full_path_to_installation_directory`

   For example, if you install Tekla license server to the default folder, you need to enter `cd /D C:\Tekla\License\Server`.

   `installanchorservice.exe`

⚠️

Cannot connect to the license server.

Solution: For the first time that you connect to the Tekla license server a client computer that has a new version of Tekla Structures installed, you need to do the following:

• Ensure that both (the client computer and the license server) are in the same domain.

• Ensure that Local Area Network connection is established. The license server and the client computers need to be in the same Local Area Network.

• Turn off the firewall and pause the antispyware/antivirus protection of your computer.

After the steps above do the following on your company's license server:

1. Make sure that no one is using Tekla Structures (ask all users to close Tekla Structures).

2. Go to `C:\Tekla\License\Server` and open the `tekla.lic` file in a text editor.

3. Add a free TCP/IP port for the licensing service at the end of the first row, if it does not exist by default. Note that the automatic installation option sets the port by default to 27007.

   Example of the first row: `SERVER MYSERVER ANY 27007`, where `MYSERVER` is the license server and `27007` is the port.

4. Save and close the file after changes.

5. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.

6. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.

7. On the **Start/Stop/Reread** tab, click **Stop Server**. Wait couple of seconds and click on **Start Server**.

After defining the server and the port, do the following on your Tekla Structures workstations:

1. Start Tekla Structures.

2. When you are asked for a server, add the port to the front of the server definition and click **OK**.

   Example: `27007@MYSERVER`

⚠

Cannot start the Tekla licensing service.

Reason: The `tekla-debug.log` file may be locked, thus preventing the service from starting.

Solution: Delete the `tekla-debug.log` and restart the computer.

See also

Problems in Tekla licensing: Error codes and their descriptions (page 93)

Installing Tekla license server (page 42)

Allowing Tekla license server to operate through Windows Firewall (page 51)

Problems in FlexNet

⚠

An internal error occurred. FlexNet internal error.

Reason: There is a problem with the Tekla license server installation.

Solution: This error can often be fixed by performing the steps below:

1. Uninstall all existing Tekla license server installations.

2. Check that all the files are deleted from the Tekla license server installation folder: `..  \Tekla\License\Server`.

3. Install the latest Tekla license server. Check for the latest version in Tekla Downloads.

See also

Installing Tekla license server (page 42)

Uninstall Tekla Structures (page 377)

Problems in Tekla licensing: Error codes and their descriptions (page 93)

Problems in Tekla license activation

⚠️

The following message is displayed: "Error reading entitlement file".

Reason: The .NET Framework is not working for some reason.

Solution: Reinstall the existing .NET Framework, or install the latest .NET Framework version that is available for your operating system.

⚠️

License activation fails, and the following message is displayed: "Unable to activate more licenses than you are entitled to".

Reason: There are a couple of possible reasons for the problem:

- You may have activated licenses on another computer. You cannot activate more licenses than you are entitled to.

- You tried to activate a renewed temporary license or a permanent license without deactivating the previous temporary license.

Solution: There are two possible solutions:

- Deactivate a license on another computer and then activate the license on your computer.

- Deactivate the existing temporary license and then activate the succeeding linked license.

For more information about deactivating licenses, see Deactivate Tekla licenses (page 67).

⚠️

The amount of activated licenses in Tekla License Administration Tool and LMTOOLS does not match.
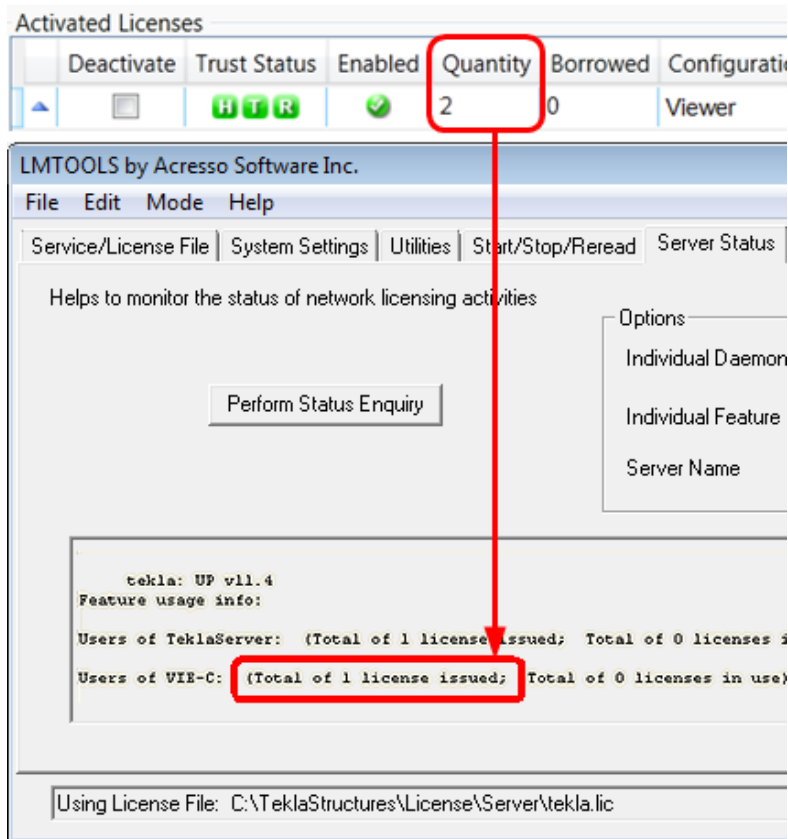
Reason: The licensing service is not updated with new license information.

Solution 1: Reread the license file in **LMTOOLS**:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.

2. On the **Start/Stop/Reread** tab, click **ReRead License File**.

Solution 2: If you are connected to several license servers, rereading the license file may not work. In that case, you need to stop the license server and then restart it in **LMTOOLS**:

1. Ensure that no one is using Tekla license server.

2. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.

3. On the **Start/Stop/Reread** tab in **LMTOOLS**, select the **Force Server Shutdown** check box and click **Stop Server**.

4. Check that the status is "Stopping server". Wait for a few minutes.

5. Click **Start Server**, and ensure that "Server Start Successful" is displayed.

TIP To avoid the problem in the future, ensure that the license server is automatically notified when you activate, deactivate, or repair licenses.

To enable the automatic notification functionality in Tekla License Administration Tool, click the **Notify Server** button.

For more information about starting and stopping server and rereading the license file, see .

For more information about activating licenses, see Activate Tekla licenses (page 62).

⚠

No warning is displayed, even though the temporary license will expire within one month.

Reason: The expiry warning message appears only when someone uses the expiring license. Probably there are several permanent licenses (that have been activated first) and some temporary licenses that have been activated after the permanent ones.

When somebody starts Tekla Structures, the system uses licenses in the order of activation. For example, if you have 10 permanent and 2 temporary licenses, all 10 licenses must be in use before someone obtains the temporary license, and receives the warning about the expiring license.

⚠

When you try to open the entitlement certificate in Tekla License Administration Tool, nothing is shown.

Reason 1: You have not downloaded the attached entitlement certificate from your e-mail application, but opened the certificate in an Internet browser and saved it as an `.html` file from the browser.

Solution: Open the e-mail containing the entitlement certificate attachment `EntitlementCertificate.html`. Download the entitlement certificate to the `..\Tekla\License\Server` folder from e-mail. Then try to open it again in Tekla License Administration Tool by clicking **Open**.

For more information, see Activate Tekla licenses (page 62).

Reason 2: The virus protection system of your computer has removed the Trimble Solutions logo from the license entitlement certificate.

Solution: The sender of the entitlement certificate should zip the entitlement certificate file. Unzip the entitlement certificate file on the computer where the licenses are going to be activated.

⚠

License was activated successfully, but the following error message is displayed when you run the command line command "serveractutil -view": "Activation library initialization failed."

Reason: The license server installation was not successful.

Solution: Do the following:

1. Stop other FlexNet licensing services in **LMTOOLS**.

2. Run the `installanchorservice.exe` at the command prompt, restart the license server.

After doing this you will be able to activate your licenses and use Tekla Structures.

If the above did not work, you need to uninstall the license server and reinstall the recent version once again with administrator rights.

For more information about uninstalling and installing the license server, see Uninstall Tekla Structures (page 377) and Installing Tekla license server (page 42).

⚠️

The automatic notification functionality in Tekla License Administration Tool does not work: nothing happens when you click the Notify Server button

Reason: One of the reasons why the **Notify Server** button does not work in Tekla License Administration Tool might be that Tekla Licensing Service is not started on the computer.

Solution: To solve the issue, open Windows **Control Panel** --> **Administrative Tools** --> **Services** . Ensure that the Tekla Licensing Service status is **Running** . The **Startup Type** of the service should be set either to **Automatic** or to **Automatic (Delayed Start)**.

⚠️

Your licenses no longer appear as activated licenses, or old version licenses are activated, but they do not work.

Reason: Windows system restore may cause problems for licensing. For more information, see Windows system restore might affect your model and licensing.

Useful links

For more information about the status of the activated licenses in the trusted storage, see instructions in the following Support Articles in Tekla User Assistance:

Checking the status of the activated licenses in the trusted storage

Checking the status of the activated licenses in the trusted storage (including borrowing info)

See also

Problems in Tekla licensing: Error codes and their descriptions (page 93)

Problems in Tekla license deactivation

⚠️

Unable to select a license for deactivation.

	Deactivate	Trust Status	Enabled	Quantity	Borrowed	Configuration	Version	Expiration Date	Type	Activation ID	Order ID
▶	☐	H T R	✅	1	1	SteelDetailing...	2018	15.11.2018	Enter...	4873-A2E9-...	Tekla HQ

Reason: You cannot select a license for deactivation if the license is still borrowed.

Solution: Return the license and then deactivate the license.

See also

Problems in Tekla license borrowing

⚠️

Unable to select a date from the calendar in the Borrow Until box.

Reason: The maximum borrowing period is one month.

Solution: In Tekla License Borrow Tool, select a date that is within one month from the date of borrowing:

1. Go to **Tekla License Borrow** --> **Tekla License Borrow Tool** through the **Start** menu or **Start screen**, depending on your Windows operating system.

2. In the **Products** area, click the **Borrow Until** box and select from the calendar the expiration date that is within one month from the date of borrowing.

⚠️

Tekla Structures does not start up with the borrowed license.

Problem: You borrowed a license and disconnected from the network. When you open Tekla Structures, the licensing dialog box is displayed, but Tekla Structures does not find the borrowed license.

Solution: If Tekla Structures does not start up with the borrowed license, please type only an asterisk character (*) into the server box in the licensing dialog box.

This will force Tekla Structures to search for all possible locations for the license. It might take some time until it finds the license.

⚠

The computer that is running a borrowed license crashed, what should I do?

Solution: If your computer only needs rebooting, you can use the borrowed license again after rebooting. If your computer completely breaks down, the license will automatically be available on the license server when the borrowing period expires.

See also

Problems in Tekla licensing: Error codes and their descriptions (page 93)

Set up license borrowing for offline use (page 100)

Problems in Tekla license trusted storage

⚠

A license cannot be used.

Trust Status

H T R

Reason: The **Host** (**H**) trust status of your license is not trusted. Hardware setup of your server computer has changed radically.

Solution: The licenses with the untrusted **H** trust status cannot be repaired. Contact your local support.

We recommend that you run your license server on a proper server computer that is regularly maintained. You need to deactivate your licenses before performing any maintenance actions on your server computer. However, unnecessary deactivations should be avoided due to technical and security reasons.

For more information, see Repair a license (page 76).

⚠

A license cannot be used.

Trust Status

H T R

Reason: The **Time** (**T**) trust status of your license is not trusted. Time settings of your server computer have changed radically.

Solution: You need to set the correct system date and time and after that repair the license in Tekla License Administration Tool.

Do not manipulate system clock settings of the server computer that has activated licenses.

For more information, see Repair a license (page 76).

⚠️

A license cannot be used.

Reason: The **Restore** (**R**) trust status of your license is not trusted. Your backup system may have overwritten some licensing information.

Solution: You need to repair the license in Tekla License Administration Tool.

We recommend that you configure your system backup settings so that the existing licensing software, tools and files are not automatically overwritten or replaced with the restored ones.

For more information, see Repair a license (page 76).

See also

Problems in Tekla licensing: Error codes and their descriptions (page 93)

Repair a license (page 76)

Problems using LMTOOLS in Tekla licensing

⚠️

LMTOOLS does not reread the license file.

Reason: Rereading the license file does not work if you are running a licensing service locally on your computer and you are connected to another license server at the same time.

Solution: You need to stop and restart the licensing service. Do the following:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.

2. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.

3. On the **Start/Stop/Reread** tab, click **Stop Server** and wait a few seconds for the service to stop.

4. Click **Start Server**.

⚠️

LMTOOLS is unable to stop the license server, and the message "Unable to Stop Server" is displayed in the LMTOOLS message bar.

Reason: You may have selected an incorrect licensing service.

Solution: You need to select Tekla Licensing Service as the licensing service. Do the following:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.

2. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.

3. Go to the **Start/Stop/Reread** tab, and click **Stop Server**.

4. If this does not help, select the **Force Server Shutdown** check box and click **Stop Server** again.

⚠

LMTOOLS is unable to stop the license server.

Reason: You did not run **LMTOOLS** with administrator rights.

Solution: Run **LMTOOLS** with administrator rights. For more information, see Rights needed for performing administrator's tasks in Tekla Structures licensing (page 35).

⚠

Starting or stopping the server or rereading the license file cannot be performed, and the message "No Server Selected" is displayed.

Reason: You have not selected the licensing service.

Solution: You need to select Tekla Licensing Service as the licensing service. Do the following:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.

2. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.

3. Go to the **Start/Stop/Reread** tab and start or stop the server or reread the license file.

⚠

Starting or stopping the server or rereading the license file is not possible.

The status list in **LMTOOLS** indicates that the license server manager (lmgrd) has not been started: "Error getting status: Cannot connect to license server system. The license server manager (lmgrd) has not been started yet, the wrong port@hostname or license file is being used, or the port or hostname in the license file has been changed".

Reason: LMTOOLS points to the wrong lmgrd.exe.

Solution: You need to modify the settings in **LMTOOLS**. Do the following:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.

2. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.

3. Go to the **Config Services** tab, and click **Browse** to locate the `lmgrd.exe` file.

   By default, the file is installed in the `..\Tekla\License\Server` folder.

4. Click **Save Service**.

5. Go to the **Start/Stop/Reread** tab and click **Stop Server**.

6. Click **Start Server** to restart the server.

   The changes are applied.

⚠

LMTOOLS does not show the licensing service status.

The status list on the **Server status** tab in **LMTOOLS** indicates that the license file cannot be found: "Error getting status: Cannot find license file. The license files (or license server system network addresses) attempted are listed below. Use LM_LICENSE_FILE to use a different license file, or contact your software provider for a license file".

Reason: You are trying to perform a status enquiry of a licensing service that is not running.

Solution: You need to start Tekla Licensing Service. Do the following:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.

2. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.

3. Go to the **Start/Stop/Reread** tab and click **Start Server**.

4. Go to the **Server Status** tab and click **Perform Status Enquiry** again.

See also

Install Tekla license server - manual installation (page 45)

Configure Tekla license server manually (page 49)

Problems in Tekla licensing: Error codes and their descriptions (page 93)

Problems in starting Tekla Structures

⚠ **Tekla Structures does not start. The following message is displayed: "Error when connecting to the license server. Contact your system administrator or try another server".**

Reason: You are not connected to the license server.

Solution: Check the following:

- Check that your network connection is working.

- Check that you have entered the license server name correctly.

  For more information, see Preconfigure license server settings for users (page 66).

- Check that license information in **LMTOOLS** is correct. If not, reread the license file in **LMTOOLS** and try to start Tekla Structures again.

  For more information about **LMTOOLS**, see .

⚠

Tekla Structures does not start. The following message is displayed: "License server system does not support this feature".

Reason: Your license server may not be up to date.

Solution: Update the status of your license server. Do the following:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system. Start **LMTOOLS** using administrator rights.

2. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.

3. On the **Start/Stop/Reread** tab, click **Stop Server** and wait a couple of seconds.

4. Click **Start Server**.

5. Start Tekla Structures.

If the problem still persists, contact your local Tekla Structures support. The support will need a copy of the following files: `tekla.lic`, `tekla.opt`, and `tekla_debug.log` files.

⚠

Tekla Structures does not start occasionally.

The following message is displayed: "Cannot connect to license server system. The license server manager (lmgrd) has not been started, the wrong port@host or license file is being used, or the port and hostname in the license file has been changed".

Reason: There may be communication problems between your license server and Tekla Structures client computers if the port of the license server is not defined.

Solution: Define the port for the license server. Do the following:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.

2. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.

3. On the license server computer, define a free port for the license server in the `tekla.lic` file. For more information, see Modify the license file tekla.lic manually (page 48).

4. Go to the **Start/Stop/Reread** tab and stop the license server by clicking **Stop Server**.

5. Click **Start Server**.

6. Start Tekla Structures on a client computer.

7. In Tekla Structures, click **Tools** --> **Change License Server** . Define the port and hostname of the license server.

8. Close Tekla Structures.

9. Repeat steps 5 to 7 on all Tekla Structures client computers.

See also

Preconfigure license server settings for users (page 66)

Problems in Tekla licensing: Error codes and their descriptions (page 93)

Problems with options file tekla.opt

⚠
The tekla.opt file does not take effect.

Reason: The licensing service has not read the options file.

Solution: Do the following:

1. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.

2. On the **Service/License File** tab, ensure that **Configuration using services** and Tekla Licensing Service are selected.

3. On the **Start/Stop/Reread** tab, click **ReRead License File**.

4. Browse to the `..\Tekla\License\Server` folder and open the `tekla_debug.log` file and the `tekla.opt` file with a text editor.

5. Check that the `tekla_debug.log` file contains the same keyword strings as the `tekla.opt` file.

    If this does not help, please contact your local support.

See also

Modify Tekla license access rights (tekla.opt) (page 71)

Problems in Tekla licensing: Error codes and their descriptions (page 93)

Problems in Tekla licensing: Error codes and their descriptions

Error 6

Problem: License library initialization failed with error: Activation Library Initialization error #6. Please, contact software vendor to resolve the problem.

Reason: Tekla license server installation folder contains `.dll` files that are from the previous Tekla license server version.

Solution: To resolve the problem, do the following:

1. Close Tekla License Administration Tool and stop the Tekla license server in **LMTOOLS** by clicking **Stop Server** on the **Start/Stop/Reread** tab.

2. Uninstall all existing Tekla license server installations.

3. If the Tekla license server installation folder contains any `.dll` files, remove the files manually.

4. Now you can install Tekla license server to the same folder where the uninstalled version was.

For more information about license server installation, see .

NOTE Deactivation is not needed in this case. Licenses are kept safe in a specific Flexera Software location outside Tekla license server installation directory.

Error 20

Problem: Error 20: The licensing service is not installed.

Reason: The error occurs when you are starting Tekla License Administration Tool, or when you are trying to run `serveractutil.exe` command line tool.

Solution: If you selected the **Manual** option for Tekla Licensing Service installation then you need to manually install FLEXnet licensing service:

1. If you have some other FlexNet licensing service running on the server, stop it before entering the commands.

2. Go to the **Start** menu or **Start screen**, depending on your Windows operating system, and open **Command Prompt** as an administrator.

3. At the command prompt, type the following commands:

    `cd /D full_path_to_installation_directory`

    For example, if you install Tekla license server to the default folder, you need to enter `cd /D C:\Tekla\License\Server`.

    `installanchorservice.exe`

Error 109

Problem: There are no activated licenses to return. Another program may have modified the activated licenses rights concurrently. (109) Unable to return as there is no licenses in Trusted Storage.

Reason: The trusted storage has been modified, probably by some other program.

The red Restore (**R**) trust status of your license is not trusted. The license is broken, therefore it cannot be returned.

Solution: The license will become available on the server machine automatically when the borrow period ends.

Error 123 or error 50030

Problem: Message 1: Row n: An error occurred but FLEXnet Licensing did not return an error number. (123)

Message 2: Failed to load trusted storage or specified ASR. (50030)

Reason: These error messages indicate that the trusted storage cannot be loaded, and your trusted storage is corrupted.

Solution: Your licenses need to be replaced. Contact your local Tekla representative for a replacement along with some instructions.

Error 1316

Problem: License server installation fails.

The following message is displayed: "A network error occurred while attempting to read from the file `C:\Documents and Settings\<user>` `\Local Settings\Application Data\Downloaded Installations` `\...\Tekla Structures License Server v1.01.msi`".

Reason: You have an older version of the license server installed.

Solution: Uninstall the old version and then install the new version of the license server.

For more information about uninstalling the server, see Uninstall Tekla Structures (page 377).

Error 7174

License activation fails, and the following message is displayed: "Unspecified FLEXnet Error with code 7174 Only deployed entitlement line item can be fulfilled."

Reason: You are trying to activate an obsolete license.

Solution: You should have received a new entitlement certificate from your local Tekla representative. Try the activation again with the new entitlement certificate, and move the old obsolete entitlement certificate in an archive folder.

For more information, see Activate Tekla licenses (page 62).

Error 7284

Problem: Unspecified FLEXnet Error with code 7284. Cannot perform support actions on inactive fulfillment record FID_xxxxxxxx_xxxxxxxxxxx__xxxx.

Reason: Trusted Storage has been restored from an old backup copy. The license with fulfillment ID FID_ xxxxxxxx_xxxxxxxxxxx__xxxx has been deactivated already.

Solution: You need to restore trusted storage files from the most recent backup copy and then repair licenses if needed.

For more information about repairing licenses, see Repair a license (page 76).

Error 7288 and error 111

Message 1: The activation of the fulfillment is denied by the activation policy because fulfill count exceeded the available seat count.

Message 2: The activation of the fulfillment is denied by the activation policy because number of copies left is zero.

Reason 1: You may be trying to activate some licenses that have been activated before on another server/computer.

Solution: Deactivate the licenses from the other computer, and then activate the licenses on the new server/computer.

Reason 2: You may be trying to activate a renewed temporary license or permanent licenses without deactivating the previous linked activated licenses.

Solution: Deactivate the existing temporary licenses first and then activate the succeeding linked licenses.

For more information about deactivating licenses, see Deactivate Tekla licenses (page 67).

Error 7343

Problem: Unspecified FLEXnet Error with code 7343 Entitlement line item has expired on <date> <time>.

Reason: License has expired. It is not possible to activate or repair expired licenses.

Error 7466

Problem: License deactivation fails, and the following message is displayed: "The return of the fulfillment is denied by the return policy because max return exceeded".

Reason: You have deactivated the license too many times in a 30 days period.

Solution: You can deactivate the license again when 30 days have passed since the first deactivation of the license in the past 30 days. The number of deactivations of a license within a given time period is limited due to technical and security reasons.

Error 7581

Problem: Unspecified FLEXnet Error with code 7581. Online Return/Repair Request for the activationId XXXX-XXXX-XXXX-XXXX-XXXX-XX is not originated from the original client machine.

Reason and solution: The computer is not the same where the licenses were originally activated, and you need to return/repair licenses from the original computer. Another reason might be that the computer has changed so much that activation server at Trimble Solutions no longer recognizes it as the same one, in which case you need to replace your licenses.

For more information about returning and repairing licenses, see Returning a borrowed license (page 105) and Repair a license (page 76).

Error 9999

Problem, reason and solution:: Licensing server at Trimble Solutions is down. Wait for a while and retry.

Error 50005

Problem: Error (5005) License Activation failed - Initialization of API Failed.

Problem: The activated licenses are not visible and it is not possible to activate new licenses.

Reason: The installation package has failed to initialize or register some of the software components.

Solution: Do the following:

1. Log in with administrator's rights.

2. Close Tekla License Administration Tool.

3. Stop Tekla license server and other license servers on the same computer on the **LMTOOLS** --> **Start/Stop/Reread** tab.

4. Go to `..\Tekla\License\Server` folder.

5. Double-click `installanchorservice.exe`.

6. Start Tekla license server and other license servers on the same computer on the **LMTOOLS** --> **Start/Stop/Reread** tab.

7. Open Tekla License Administration Tool. The message should not be displayed anymore.

Error 50018

Problem: License borrowing fails.

Reason: Wrong product ID file is used.

Solution: Do one of the following:

• Export a product ID file in Tekla License Administration Tool and use the file for borrowing.

Error 50033

Problem: License borrowing fails.

Reason 1: Your license server may not have up-to-date license information.

Solution: In **LMTOOLS**, stop and then restart the server.

Reason 2: The `INCLUDE` keyword in the options file prevents the borrowing of the configuration.

Solution: You need to add a dummy user "ACTIVATED LICENSE(S)" into the group of the included users to enable the borrowing. Do the following:

1. Open `tekla.opt` using a text editor.

2. Add "`ACTIVATED LICENSE(S)`" in the group of the included users, for example:

```
GROUP steel "ACTIVATED LICENSE(S)" user1 user2 user3
user4

INCLUDE STD-C GROUP steel
```

3. Save the changes you made in `tekla.opt`.

4. In **LMTOOLS**, reread the license file or stop the server and then start the server.

Error 50035

Problem: License borrowing fails.

Reason: The user tried to borrow a license that is not activated on the license server. For example, the user tried to borrow a version 20 license and there are only version 21 licenses activated on the server.

Solution: Do the following:

- Check that the product ID file is up to date. If not, export a new product ID file in Tekla License Administration Tool (**File** --> **Export**) and send this file to the user for borrowing. Then ask the user to save the new product ID file, open the Tekla License Borrow Tool, click **Open** and browse for the new `.tpi` file and try borrowing again.

- Check that your license information is up to date in **LMTOOLS**. If not, reread the license file.

Error 50036

Problem: License borrowing fails.

Reason: You are not allowed to borrow the license.

Solution: Do one of the following:

- The options file (`tekla.opt`) needs to be modified so that the borrowing of the license is allowed. For more information, see Modify Tekla license access rights (tekla.opt) (page 71).

- Borrow another license.

Error 50037

Problem: License returning fails.

Reason: You tried to return the license to a different license server than it was borrowed from.

Solution: You need to return the license to the same license server that it was borrowed from. Do the following:

1. Go to **Tekla License Borrow** --> **Tekla License Borrow Tool** through the **Start** menu or **Start screen**, depending on your Windows operating system.

2. Click **Setup** and enter the name of the license server where you originally borrowed the license from and click **OK**.

3. Select the **Return** check box in the **Borrowed Licenses** area to select the license for returning.

4. Click the **Return** button to return the license.

    After successful returning of licenses, the **Borrowed Licenses** area is updated.

Error 50040 or error 50041

Error 50040 or error 50041, problem 1: License activation, deactivation or repairing fails

Reason: Your license server was not able to connect to activation server at Trimble Solutions correctly. Usually this is a temporary problem in online activation.

Solution: Do the following:

*   Check that your Internet connection is working. An Internet connection is needed during license activation and deactivation. A low connection speed may also cause errors.

*   Close Tekla License Administration Tool and try to activate the license a while later.

*   Try to activate another license.

*   Your firewall may block the activation communication. Check your firewall settings. For more information, see Allowing Tekla license server to operate through Windows Firewall (page 51).

*   Check that you have the latest Tekla license server version.

*   This error could be caused by unfinalized Windows updates on the server computer. Reboot the server and try again.

*   Your Windows login user name may contain special characters. Try to log in with another user name, for example, administrator.

*   Check that your Internet connection is working.

*   Contact your local Tekla Structures support and ask for a manual activation.

Error 50040 or error 50041, problem 2: License borrowing fails.

Reason: You are not connected to the license server.

Solution: Do the following:

*   Check that your network connection is working.

*   Start Tekla License Borrow Tool and check that you have entered the correct license server information.

See also

3.8 Set up license borrowing for offline use

Users who want to work in a location that does not have a reliable connection to the license server can borrow an activated license from the Tekla license server before leaving the office. The user receives a temporary local license file valid for a set time period.

Users can borrow Tekla Structures licenses for offline use in Tekla License Borrow Tool. Users need to have a network connection to the license server to borrow and return a license.

Borrowed licenses are reserved for the duration of the borrowing even when they are not in use, so the borrowed license is not available for other users.

Configuration files

A product ID (`.tpi`) file is needed for borrowing licenses. If you use the licensing options file (`tekla.opt`) for managing license access rights, you must always provide a customized product ID file for users. The default file that lists all configurations will technically work in other cases, but administrators should still provide a customized product ID file. The customized file makes it easier for the users to select a license, because it includes just those licenses that you have actually activated on the server. For more information, see Provide offline users with a customized product ID file (page 101).

You can define which licenses are available for which users in the licensing options file (`tekla.opt`) on the license server. For more information, see Modify Tekla license access rights (tekla.opt) (page 71).

How license borrowing works

License borrowing reserves and releases the licenses like this:

- The maximum license borrow period is one month. The user defines the borrow expiration date when borrowing the license. The borrowed licenses are unavailable to other users until they are returned or the license borrow period ends.

- The user can return a license before the license borrow period is over through the license borrow tool on the borrowing computer. Make sure

your users return all borrowed licenses before a major operating system upgrade, reinstallation or major hardware changes on their computer.

- Borrowed licenses must be returned before you deactivate those licenses on the license server, for example, to upgrade the licenses to a new version or to move the license server to new hardware. You can see who has borrowed which licenses by enquiring the license status in the LMTOOLS application on the license server.

NOTE If you do not follow the guidelines above, all users may lose the use of the borrowed licenses until the end of the license borrowing period, including the users who originally borrowed the licenses.

---

1. Install the Tekla License Borrow Tool on the users' computers with customized product ID file(s).

2. To borrow a license, users must open the Tekla License Borrow Tool installed on their computer when they are still online and can connect to the Tekla license server.

   The version of Tekla License Borrow Tool should be the same as the version of Tekla license server.

3. After borrowing a license, users can go offline and freely work with, close and reopen Tekla Structures within the license borrow period.

4. When the users are back online, they should return the borrowed licenses to the license server.

   If a user does not return the license, it becomes available for other users on the license server after the license borrow time is over. However, the license is still listed in the license borrow tool for the user until the user returns it.

For detailed instructions, see Set up Tekla License Borrow Tool for Tekla Structures offline use (page 102).

For end-user instructions, see Borrow a license from Tekla license server (page 104) and Return a borrowed Tekla license (page 105).

See also

Problems in Tekla license borrowing (page 86)

Problems in Tekla licensing: Error codes and their descriptions (page 93)

Provide offline users with a customized product ID file

Tekla License Borrow Tool needs the activation IDs of the licenses during borrowing. When you export a product ID file (`.tpi`) in Tekla License Administration Tool, the activation IDs of the activated licenses are written in the file. Then you can send the file to offline users.

When you install Tekla License Borrow Tool, the `standard.tpi` file is automatically installed in the `..\Tekla\License\Borrow` folder. This default product ID file lists all Tekla Structures configurations and their product IDs. However, users can only borrow the licenses that are activated on the license server.

You can create a customized product ID file that only lists the activation IDs of the activated licenses available for borrowing. You need to export the product ID file on the license server computer using Tekla License Administration Tool and save the file on the computers of the users who borrow licenses. The activation IDs are encrypted.

WARNING	Product ID files are not updated automatically. If you deactivate borrowable licenses or activate new licenses for borrowing, you need to export a new product ID file and send it to Tekla Structures offline users who borrow licenses.

To export the product ID file on the Tekla license server computer:

1. Go to **Tekla Licensing** --> **Tekla License Administration Tool** through the **Start** menu or **Start screen**, depending on your Windows operating system.

2. Click **Export**.

3. In the **Save Product ID file As** dialog box, enter the name of the product ID file or keep the default file name, select a folder where you want to save the file and click **Save**.

4. Send the product ID file to the Tekla Structures users who need to borrow licenses and inform the users about the usage of the file.

    If the name of the file is `standard.tpi` and the file is saved in the `..\Tekla\License\Borrow` folder on the user's computer, the file is opened automatically when the user starts Tekla License Borrow Tool.

See also

Set up Tekla License Borrow Tool for Tekla Structures offline use

You can use Tekla Structures offline by borrowing Tekla licenses with Tekla License Borrow Tool.

Before you start, download and install the latest Tekla License Borrow Tool from the Tekla Downloads product download page.

You can use the same Tekla License Borrow Tool for borrowing licenses for different Tekla Structures versions. The version of Tekla License Borrow Tool should be the same as the version of Tekla license server.

To set up Tekla License Borrow Tool for Tekla Structures offline use:

1. Go to **Tekla License Borrow** --> **Tekla License Borrow Tool** through the **Start** menu or **Start screen**, depending on your Windows operating system.

2. In the **Setup** dialog box, enter the port number and the hostname (computer name) of the license server in the **Server** box in the format `port@hostname`, for example, `27007@server_hostname`.

3. Still in the **Setup** dialog box, click **Browse** and select the product ID file.

4. Click **OK**.

    The **Products** area in the Tekla License Borrow Tool is updated.
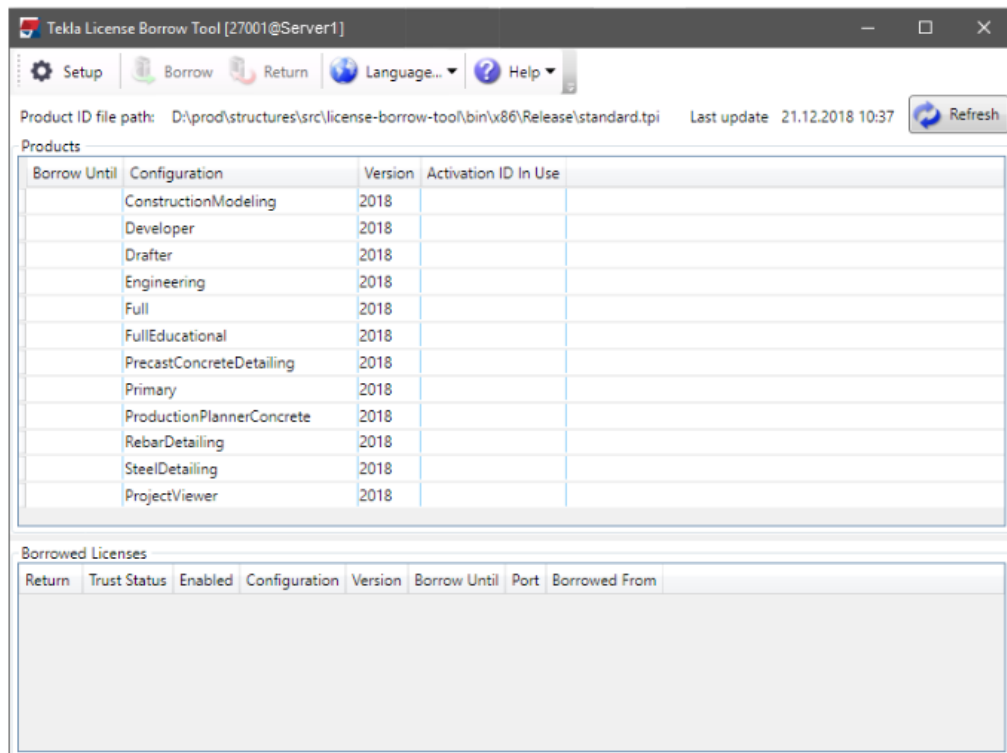
5. In the Tekla License Borrow Tool dialog box, click **Language** and change the language of the Tekla License Borrow Tool user interface, if necessary.

NOTE When you start Tekla Structures, and if Tekla Structures does not start with the borrowed license, enter an asterisk (*) in the server box of the licensing

dialog box. This will force Tekla Structures to search for all possible locations for the license. This may take a while.

See also

Borrow a license from Tekla license server

In Tekla License Borrow Tool, you can borrow licenses from Tekla license server when you want to work offline. Borrow the license on the same computer that you will use for offline work.

Before you can borrow a license, you need to install Tekla License Borrow Tool, connect the computer with Tekla Structures to the license server and open the product ID file.

For more information about the prerequisites, see Set up Tekla License Borrow Tool for Tekla Structures offline use (page 102).

To borrow a license:

1. Close Tekla Structures.

2. Go to **Tekla License Borrow** --> **Tekla License Borrow Tool** through the **Start** menu or **Start screen**, depending on your Windows operating system.

3. Click the **Setup** button at the top of the dialog box.

4. In the **Setup** dialog box, enter the port number and the hostname (computer name) of the license server in the **Server** box in the format `port@hostname`, for example, `27007@server_hostname`.

   You need to use exactly the same port and host name as when starting Tekla Structures.

5. Still in the **Setup** dialog box, click **Browse** and select the product ID file.

6. Click **OK**.

7. In the **Products** area, click the **Borrow Until** box and select the expiration date for the borrowing period from the calendar.

   The maximum borrowing period is one month. The exact maximum borrow period varies between 29 to 32 days depending on the borrowing date.

Products					
Borrow Until	Configuration	Version	Activation ID In Use	Start Date	Expiration Date
15.11.2018	SteelDetailing	2018	✔	1.11.2018	30.11.2018

8. Click the **Borrow** button to borrow the license.

The borrowing progress is displayed in the **Borrowing License(s)** dialog box. After successful borrowing, the **Borrowed Licenses** area shows the borrowed license.

Return	Trust Status	Enabled	Configuration	Version	Borrow Until	Borrowed From
☐	H T R	✓	SteelDetailing	2018	15.11.2018	Z-USERX

9. To ensure that the borrowing succeeded, disconnect your computer from the license server and start Tekla Structures with the borrowed license.

See also

Problems in Tekla license borrowing (page 86)

Problems in Tekla licensing: Error codes and their descriptions (page 93)

View and diagnose errors in Tekla Structures license activation, deactivation and borrowing (page 78)

Set up license borrowing for offline use (page 100)

Return a borrowed Tekla license

You can return a borrowed license back to the Tekla license server before the expiration date.

A borrowed license is automatically available on the license server on the day following the expiration date.

However, the **Borrowed Licenses** area in Tekla License Borrow Tool is not automatically updated. The license should be returned to the server that has the same name as the name of the server from which the license was borrowed. We recommend that you always return the expired licenses when you want to stop borrowing a license.

To return a borrowed Tekla license:

1. Ensure that you are connected to the license server.

2. Close Tekla Structures.

3. Go to **Tekla License Borrow** --> **Tekla License Borrow Tool** through the **Start** menu or **Start screen**, depending on your Windows operating system.

4. Select the **Return** check box in the **Borrowed Licenses** area to select the license for returning.

5. Click the **Return** button to return the license.

   After successful returning of licenses, the **Borrowed Licenses** area is updated.

See also

Problems in Tekla licensing: Error codes and their descriptions (page 93)

4 Create and distribute customized configurations

To create your customized Tekla Structures configurations and use them in different projects and on different computers:

- Get familiar with the different configuration files and some basic ways to change how Tekla Structures works, see Implementation guide for administrators (page 107).

- You can use Trimble's default settings as well as create your company's general settings and project-specific settings, see Environment, company, and project settings for administrators (page 119).

Many of the configurations you distribute are closely linked to working in Tekla Structures and you find the instructions related to the configuration files you can distribute as part of the documentation of each feature. Additionally, you can find some general configuration tasks in this section:

- You can distribute customized ribbons (page 125), tabs (page 127), property pane layouts (page 129), and toolbars (page 130).

- You can customize the catalogs of materials (page 131), profiles (page 139), shapes (page 202), bolts (page 210), reinforcement (page 227), and applications and components.

4.1 Implementation guide for administrators

Tekla Structures administrator is the person responsible for ensuring that the company standards are used and set up in Tekla Structures. The following sections explain how you can customize Tekla Structures.

Customizing Tekla Structures

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

Your local technical team is dedicated to improving your knowledge and experience of each new version. The team aims at enhancing your user experience of Tekla Structures by performing tasks that have been identified as essential by the existing users, new users, and potential users.

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

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

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

The three last ones are mainly managed by company administrators.

Setting up the standard that a company uses, and the standards that a specific project needs will make the designing process much more efficient because the end user can concentrate on the design process.

Tekla Warehouse

Tekla Warehouse has a lot of additional content, such as application tools and environment content. You can download Tekla Warehouse offline content that includes the catalog content of environments, such as profiles, bolts, materials, and reinforcement.

The offline catalog content is under **Tekla Structures collections** in Tekla Warehouse. The content is in `.tsep` packages that are installed when opening Tekla Structures.

You can also create a local collection for your company, and share it for your organization in your internal network. You can manage the access rights on the folder and collection level in the `collections.json` file on each user's computer. Copy the file to the same location on each user's computer. The file is located in `C:\Users\Public\Public Documents\Trimble\Tekla Warehouse\collections.json`.

The image below shows an example of the collection paths with four Tekla Structures collections:

```
{
  "collections":
  [
    "\\\\Server1\\Tekla Warehouse\\OfflineContent\\austria",
    "\\\\Server1\\Tekla Warehouse\\OfflineContent\\brazil",
    "\\\\Server1\\Tekla Warehouse\\OfflineContent\\china",
    "\\\\Server1\\Tekla Warehouse\\OfflineContent\\czech",
  ]
}
```

In Tekla Warehouse the collections are found after mapping under **My collections** --> **Local and network collections** .

Local and network collections

Overview of environments, roles and licenses

Tekla Structures is one product that has many different configurations. The licenses you have determine which configurations you can use.

A Tekla Structures **environment** is set up for the materials, grades, profiles, drawing settings, component settings, `.ini` file settings that are used in a specific market. There are over 30 different environments in Tekla Structures. By choosing a specific environment when starting Tekla Structures you will get the settings for that market. You can install several environments, and add missing environments later.

The blank project listed in the environments is an empty platform for your own environment or project settings. It includes standard parametric profiles, undefined bolt, material and rebar grades, basic drawing layouts and so on, which you can complement from your own firm or project folders and Tekla Warehouse.
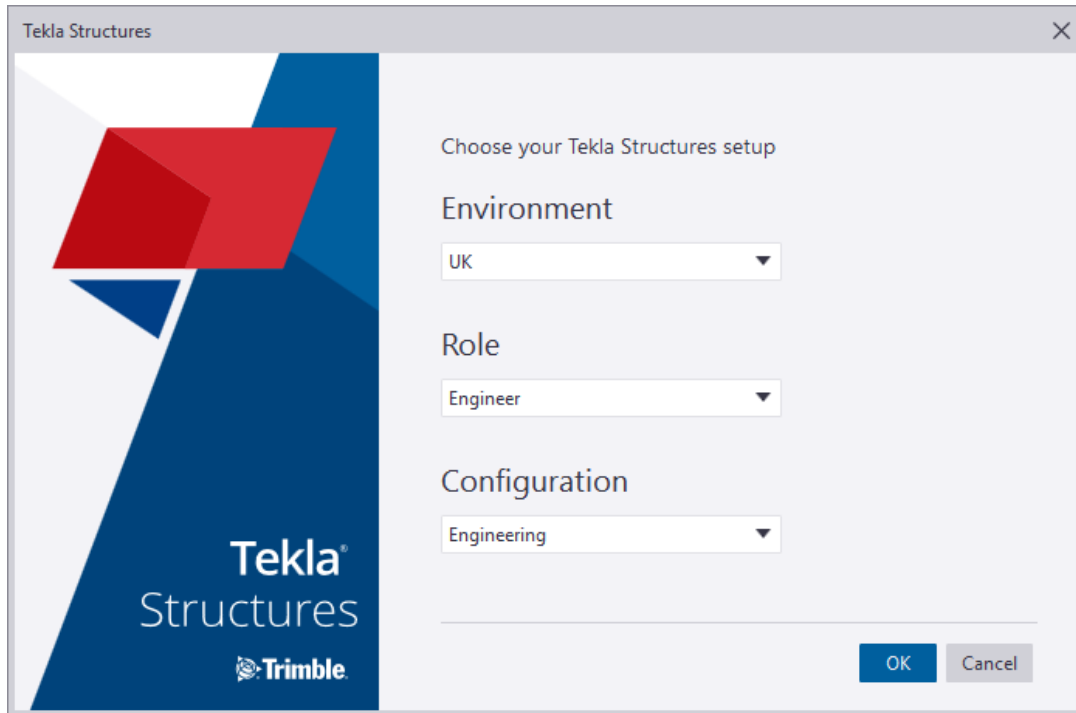
Some environments give you the opportunity to select a **role** when logging in. The role is independent from the licenses that are used. The purpose of the roles is to make the user interface and settings clearer, easier and faster for the user's tasks.

In practice, this means that settings, filters, reports and the user interface is set up for the role the user has. For example, preloaded settings in object properties that are not relevant for the role are not shown, making the list of options shorter and clearer.

Role selection is primarily meant to be configured by Trimble and reseller localization personnel, and be part of the Tekla Structures installation package. However, advanced users and Tekla Structures system administrators can also create their own roles inside their company organization. Additional content is available in the Tekla Warehouse offline and online collections. Note that you need to have a Trimble Identity for downloading or installing from the online collections. For more information, see Trimble Identity for Tekla Online services.

Folder structure

Tekla Structures software and environments are separated into different locations due to the requirements for Windows certification. By default, the files are installed in the following folders:

- Software is installed under the `\Program Files\Tekla Structures` folder.

- Environments and extensions are installed under the `\ProgramData\Trimble\Tekla Structures` folder.

- User settings are installed under the `\Users\<username>\AppData\Local\Trimble\Tekla Structures` folder.

Project and firm folders

Project and firm folders are meant for storing the customized files. For any company, we strongly recommend setting up firm and/or project folders on a shared file server accessible to all users. If multiple teams on different sites are working on the same project, you can set up a project or firm folder in a folder in a .

Having the hierarchy of project and firm folders will make it much easier to update company settings, ensure that everyone uses the same settings in a project, and upgrade to a newer version of Tekla Structures.

All the settings that are used on the company level (for example, company logo and drawing standards) should be stored in a firm folder, and all the settings used on a specific project should be stored in the corresponding project folder. Property files are always saved in the `\attributes` folder under the current model folder, like, `\TeklaStructuresModels\<my_building>\attributes`. These files should then be copied to the project or firm folder, or to user-defined sub-folders under the project or firm folder.
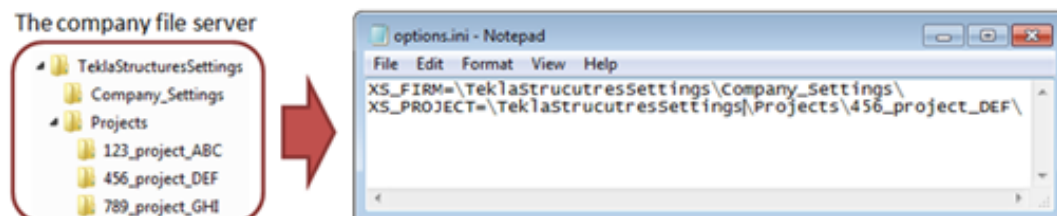
To use the saved settings in a firm and a project folder, set the path to the folder by using the `XS_PROJECT` and `XS_FIRM` advanced options. These advanced options should be put in the initialization, `.ini`, files. You can have several different `.ini` files. You can define in the Tekla Structures shortcut which `.ini` files to run and which settings to apply.

One of the most important advantages of using firm and project folders is that Tekla Structures does not replace files in the project and firm folders when you install a new version. This means that you retain your customized files without having to cut and paste, or export and import from previous versions. This makes upgrading to a newer version of Tekla Structures easier. When you store files in one place, it is also easier to update the settings and ensure that everyone in a project uses the same settings.

Example:

In the current project, *123_project_ABC*, you have set up the properties for the concrete column, and saved them as *column_ABC*. To make these saved settings available for everyone working in the *123_project_ABC* project, copy `column_ABC.ccl` from the `\attributes` folder under the model folder to the `\123_project_ABC` project folder or on your file server, or to a user-defined sub-folder under the `\123_project_ABC` project folder. Ensure that everyone in the project has the correct path for the `XS_PROJECT` advanced option in the `.ini` file.

For more information, see Create project and firm folders (page 245) and Files and folders in Tekla Structures (page 244).

Folder search order

When you open a model, Tekla Structures searches for the associated files in specific folders in a set order. It is important that you place the files in the correct folders. Once Tekla Structures finds the associated files, it stops searching. This means that the files that have the same name but are located lower down the search order are ignored.

The basic folder search order is the following:

Folder	Defined by
Model folder	Currently open model
Project	`XS_PROJECT`
Firm	`XS_FIRM`
System	`XS_SYSTEM`

You can specify more than one system folder, and this way define specific settings for each role. Use the role options defined in the `env_<environment>.ini` to point to the roles when specifying the system folders in the XS_SYSTEM advanced option. Enter the options pointing to the roles and separate them by semicolons, for example: `set XS_SYSTEM= %XS_STEEL%;%XS_ENGINEERING%;%XS_CONTRACTOR%;%XS_GENERAL %;%XSDATADIR%\environments\common\system\`

There are some exceptions to this search order. The exceptions are listed in Folder search order (page 334).

NOTE Do not store customized files in the system folder. Tekla Structures replaces these files when you install a new version.

Initialization files

Initialization files (page 246) (`.ini`) are used for launching Tekla Structures. They can contain many advanced options that you can use to configure Tekla

Structures for different standards and your own style of working. Tekla Structures automatically creates the necessary `.ini` files during installation. The number of `.ini` files it creates depends on how many country-specific environments you choose to install.

Why are .ini files needed?

There are numerous settings to be made when Tekla Structures starts. Advanced options are used to determine the appearance and the behavior of Tekla Structures, for example, the language used, behavior of part marks on drawings, and the location of your model folder. Advanced options are set through the `.ini` files. The different `.ini` files and what they do, and how they are related to each other are described below.

Different types of .ini files

The default reading order (page 247) of the `.ini` files is as shown in the image below:
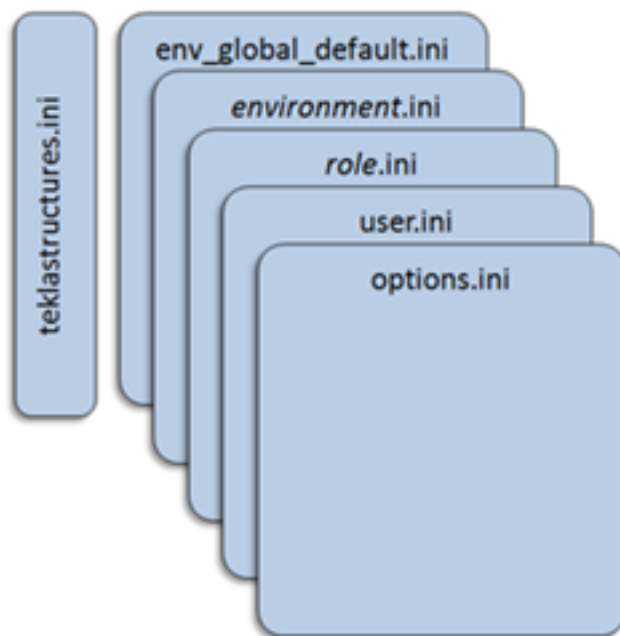
1. `teklastructures.ini`

    Initializes the settings needed for Tekla Structures to run.

    The `teklastructures.ini` file in the `\bin` folder starts Tekla Structures. We recommend that you do not make any changes to this file.

2. `env_global_default.ini`

    Sets the global default settings.

    The `env_<your_environment>.ini` file is located in the `\Environments` subfolder and it contains all the environment-specific settings. These files are set by your area office or reseller.

3. `environment.ini`

   Sets the environment-specific settings.

   You can define specific settings for roles in your environment and store these settings in role-specific folders. Organizing the folder structure based on roles is useful for keeping the role content up to date. Note that the folder structure and content may vary depending on the environment.

   In the `env_<environment>.ini` file, each role has an option where you can add the paths that point to the folders in which you have stored the role settings. For example, `XS_STEEL` (`\Steel`), `XS_CONCRETE` (`\Concrete`), `XS_ENGINEERING` (`\Engineering`) and `XS_PRECAST` (`\Precast`) each point to the folders that contain settings specific to that role. An example for steel role could be as follows:

   ```
   set XS_STEEL=%XSDATADIR%\environments\Steel\master_drawings\;%XSDATADIR%\environments\Steel\model_filters\;%XSDATADIR%\environments\Steel\model_settings\
   ```

   `XS_GENERAL` points to the `\General` folder that has content common for all roles and settings that are specific to modeling and drawings, for example.

   When defining role settings in XS_SYSTEM, you use the role options defined in the `env_<environment>.ini` to point to the role-specific settings. Note that you do not need to add the folder paths in `XS_SYSTEM` as they are defined in the `env_<environment>.ini`.

4. `role.ini`

   Sets the settings defined for a role.

   The `role_<role>.ini` file is located in the `\Environments` subfolder and it contains the settings specific for a chosen role. For example, the `role_Engineer.ini` file in the `\Environments\uk` folder contains all the settings for the Engineering role in the UK environment.

5. `user.ini`

   Sets the settings specified by the user.

   The `user.ini` file contains your personal settings. The advanced options in `user.ini` override those in other `.ini` files. For example, if you have set the same advanced option in an `.ini` file, in a file in the environments subfolder and the `user.ini` file, Tekla Structures uses the value in the `user.ini` file. The `user.ini` is located in the `C:\Users\<user_name>\AppData\Local\Trimble\Tekla Structures\<version>\UserSettings` folder.

6. `options.ini`

   Sets the settings specified for the company/project/model.

If there are several settings for the same advanced option, the later setting in the reading order overrules the previous one. This means that the settings in

`user.ini` overrule the settings in `env_global_default.ini`, and the settings in `user.in` can be overruled by the settings in `options.ini`.

The `lang_enu.ini` is the initialization file for the English language settings. The file is located with the other installed languages in the `\Tekla Structures\<version>\nt\bin` folder.

We recommend that you make all your customizations in the `options.ini` file under the model folder, or in the `user.ini` file. This way the customizations are kept when you install the next version of Tekla Structures.

Setting advanced options in .ini files

Tekla Structures contains three kinds of advanced options: user-specific advanced options, system-specific advanced options, and model-specific advanced options.

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

User-specific advanced options set your personal preferences, for example the appearance of the Tekla Structures window. Tekla Structures saves user-specific advanced option settings in the `options_<your_username>.ini` file, located in the `C:\Users\<user_name>\AppData\Local\Trimble \Tekla Structures\<version>\UserSettings` folder.

The `options.ini` file contains the settings for **model-specific advanced options**. It is located in the current model folder. To share your settings with other people, copy the `options.ini` file to the system, project or firm folder.

The **system-specific advanced options** are stored in all other `.ini` files.

Setting advanced options

There are two methods for setting advanced options:

- The advanced options are grouped in different categories according to their usage in the **Advanced Options** dialog box. To access the dialog box, click **File** --> **Settings** --> **Advanced options**. See more in .

- The `.ini` files are plain text files that can be edited with a text editor, for example Notepad. The settings will then be saved in the `options.ini` file under the model folder for the model that you have open. The settings can then easily be copy-pasted into another `.ini` file. See more in File storing options and advanced options (page 254).

We recommend that you only use one of these methods to set advanced options. The settings in the **Advanced Options** dialog box override those in the `.ini` files. Some advanced options need a Tekla Structures restart to activate the new setting.

To set an advanced option in the `user.ini` file:

1. Locate the `user.ini` file in the `C:\Users\<user_name>\AppData\Local\Trimble\Tekla Structures\<version>\UserSettings` folder.

2. Select and right-click the `user.ini` file in Windows Explorer and click **Open with**. You can open the file in any standard text editor.

3. Check that the advanced option is set to the value you want. If it is, you can stop here.

4. To change or add the advanced option, on a new line, type `set`, add a space and the name of the advanced option followed by its value in a single line.

   Tekla Structures only reads lines in the initialization file that start with set, for example, `set %XS_DIR%=C:\TeklaStructures\2019 .`

5. Save the `user.ini` file.

Creating shortcuts

To use the correct `.ini` files for a specific project, the easiest way is to create a shortcut for the project on the desktop. Shortcuts are used to start `teklastructures.exe` with the defined initializations.

1. Make a copy of the default shortcut: In the Windows **Start** menu or **Start screen**, find **Tekla Structures <version>**, then right-click the Tekla Structures <version>.

2. Select **Copy** from the pop-up menu.

3. Paste the shortcut to your desktop.

4. Select the shortcut and right-click.

5. Select **Properties** from the pop-up menu.

6. Modify the **Target** of the shortcut by adding the required project initializations to it.

For example, you can use the following parameters in shortcuts:

- `-i InitializationFile`: Initialization file to be read during startup, for example: `-i \\MyServer\MyProject\Project1.ini`. You can repeat this parameter as many times as you need.

- `ModelToBeOpened`: Full path to the model to be opened automatically.

- `/create:ModelToBeCreated`: Full path to model to be created automatically.

`.ini` files tell where things can be found and in which order, depending on the folder structure that the company has set up. See more in .

Bypassing the login screen

You can bypass the login screen by using a separate `.ini` file where you set the following advanced options:

- to set the remote license server address.

- XS_DEFAULT_LICENSE to set the default license for a user role.

- XS_DEFAULT_ENVIRONMENT points to the environment-specific `.ini` file, for example `%XSDATADIR%\Environments\uk\env_UK.ini`

- XS_DEFAULT_ROLE points to the role-specific `.ini` file, for example `%XSDATADIR%\Environments\uk\role_Engineer.ini`

Define the startup shortcut using the parameter `-I` (capital i), for example, `-I %XSDATADIR%\Environments\uk\Bypass.ini`. When you do this, an additional initialization file is read BEFORE the environment `.ini`.

The content of such a file could be, for example:

```
set XS_LICENSE_SERVER_HOST=27007@MY_LICENSE_SERVER_NAME
set XS_DEFAULT_LICENSE=FULL
set XS_DEFAULT_ENVIRONMENT=%XSDATADIR%\Environments\uk\env_UK.ini
set XS_DEFAULT_ROLE=%XSDATADIR%\Environments\uk\role_Engineer.ini
```

See more in Create start-up shortcuts with customized initializations (page 19).

User-defined attributes

User-defined attributes are attributes set to an object in a model or a drawing. These user-defined attributes can be used for many purposes, such as in filters, drawings, reports, export, import, fabrication, erection, and revision handling.
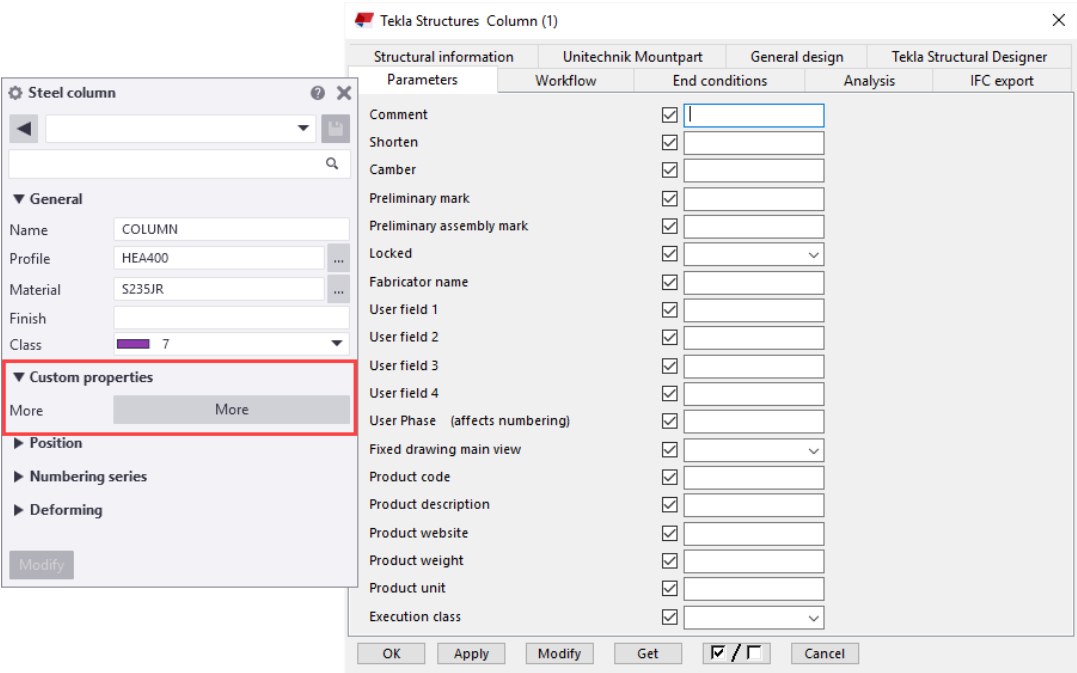
You can create your own user-defined attributes (page 282) that you need in your company, or for a specific project. The user-defined attributes can be numbers, text, lists, or dates. They can be set to be unique for an object or allowed to be copied; they can also be ignored by numbering or affect numbering.

The user-defined attributes are defined in `objects.inp` files. These files are located in different folders following the Tekla Structures folder setup, and they are merged together during startup. The `objects.inp` file reads the user-defined attributes in order from the folders listed below, starting from the model folder:

Folder defined by advanced option	Advanced option
Model	Current model folder

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

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

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

4.2 Environment, company, and project settings for administrators

Environment settings

Common settings

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

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

Country-specific settings

The country-specific settings are located in the environments folders, and they are localized by your local Trimble office/reseller. The folder structure of the environments can vary, but the same kind of settings exist. For example, the settings that are localized include profile database, material database, reports, selection filters, view filters, components and custom components, macros, user-defined attributes, and drawings settings.

Company settings

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

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

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

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

- `XS_PROJECT` points to the project folder. The folder contains project settings, such as logos for contractors and fabricators, or drawing settings, for example. The project folder can also have user-defined sub-folders for storing project-specific property files.

For more information on the folder search order, see Folder search order (page 334).

You can also use Tekla Warehouse company-specific collections online or offline, in your own network. Use Trimble Identity for downloading or installing from the online collections. See also Trimble Identity for Tekla Online services.

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

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

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

Model templates

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

When you create a model template, always start by creating a new empty model. This is because old models that have been used in live projects cannot be completely cleaned. They may contain excess information that increases

the size of the model even if you delete all objects and drawings from the model.

To create a model template:

1. Create a new model and give it a unique name.

2. Add in the model the desired profiles, custom components, and other necessary items.

3. On the **File** menu, click **Save as** --> **Save**.

   You need to save the model to include custom components in the `xslib.db1` file. If you do not save the model, custom components will not be included in the model template.

4. On the **File** menu, click **Save as** --> **Save as model template**.

5. Enter a name for the model template, and select which catalogs, drawing templates, report templates, and model subfolders you want to include in the model template.

6. Click **OK**.

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

You can download, share, and store model templates in Tekla Warehouse. The image below shows an example of a model template in Tekla Warehouse.
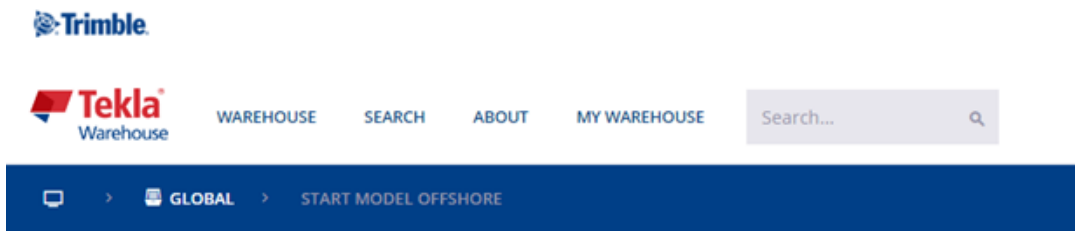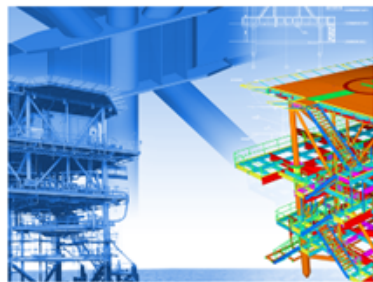
The **Insert into model** button in Tekla Warehouse installs the model template directly in the folder pointed by XS_MODEL_TEMPLATE_DIRECTORY. You can immediately use the template when creating a new model.

Model templates in Tekla Structures version update

We strongly recommend that you update your model templates in Tekla Structures version upgrade.

To update a model template:

1. Create a new model using an existing model template.

2. Give the model the same name as in the previous Tekla Structures version.

3. Open a 3D view.

4. On the **File** menu, click **Diagnose and repair** --> **Diagnose model**.

5. On the **View** tab, click **Screenshot** --> **Project thumbnail** to create a project thumbnail, or add a custom image named thumbnail.png in the model folder.

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

6. On the **File** menu, click **Save as** --> **Save**.

   If you do not do this, a message may appear warning about the model being created with a previous version.

7. On the **File** menu, click **Save as** --> **Save as model template**.

8. Select which catalogs, drawing templates, report templates, and model subfolders you want to include in the model template.

9. Click **OK**.

10. Remove manually all `*.db` files (environment database, options database files) from the model folder.

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

   Do not remove the `.idrm` files (`db.idrm` and `xslib.idrm`) as they are part of the model.

   The model template is saved in a location pointed by `XS_MODEL_TEMPLATE_DIRECTORY`.

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

Customizing reports and drawings

If your company already has graphical templates in the DXF, DWG, or DGN format, you can convert these templates to Tekla Structures templates. For detailed instructions on how to do this, see the information on AutoCAD and Microstation files in the Template Editor Help.

For information on how to create your own templates and reports, see the Template Editor Help, and and .

Cloning templates for drawings

You should consider cloning drawings when:

• There are several similar parts, assemblies, or cast units in the model.

• You need to produce single-part, assembly, or cast-unit drawings of similar parts, assemblies, or cast units.

• The drawings need a lot of manual editing.

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

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

Clone templates in Master Drawing Catalog

You can clone drawings by using the **Master Drawing Catalog** templates. A cloning template in the **Master Drawing Catalog** can also be used in other models. They can be used in projects that have the same kind of drawings.

To create cloning templates:

1. Select a drawing in **Document manager**.

2. Right-click and select **Add to Master Drawing Catalog**, and then fill in the required properties.

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

For more information on the **Master Drawing Catalog** and cloning templates, see .

Project settings

Create your own component folder

Usually, only a few different connections and components are used in a project. To ensure that everyone in the project uses the same components and finds the components faster, we recommend that you create a component folder of your own.

1. Click the **Applications & components** button ![icon] in the side pane to open the **Applications & components** catalog.

2. Create a new group for the project: Right-click in the catalog and select **New group**.

3. Add components to the group: Select the components in the catalog, right-click and select **Add to group**. Then select the group to which the components are added. You can also drag the selected components to another group.

4. Hide the groups that you do not need: Select the group, right-click and select **Hide/Unhide**.

TIP In the **Applications & components** catalog, use the commands in **Access advanced features** ![icon] > **Catalog management** to modify catalog definitions. For more information, see Customize the Applications & components catalog (page 237) and XS_COMPONENT_CATALOG_ALLOW_SYSTEM_EDIT.

For more information on the **Applications & components** catalog, see .

Define project properties

Project information is needed many times during a project. Define the project information at the beginning of a project to make reports and drawings display the correct information automatically. You can also update the project properties during the project.

1. On the **File** menu, click **Project properties**.

2. Edit the project properties.

   When you edit the properties, Tekla Structures highlights the modified properties in yellow.

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

Create and modify templates and reports

You can modify existing reports and templates, or create your own templates (page 339) by using Template Editor. To open Template Editor, click **File** --> **Editors** --> **Template editor**, or double-click an existing table in an open drawing to open the tool. For more information, see Template Editor User's Guide.

Note that if your templates are located in a protected folder, the templates are read-only, and you cannot save a modified template in a protected folder. In this case, run Tekla Structures as an administrator.

Set up printers

Tekla Structures uses Windows drivers to write the print data directly to the Windows print device interface. You can print drawings as PDF files, save them as plot files (`.plt`) for printing with printer/plotter, or print them on a selected printer. To print to several paper sizes, you need to modify the `drawingsizes.dat` file, see more in . You can also change the line width of the printed drawings, see more in and .

You can affect the way Tekla Structures automatically names the `.pdf` files and plot files by using certain drawing-type-specific advanced options, see more in .

4.3 Distribute customized ribbons using a firm or environment folder

You can distribute customized ribbon files to other users in the company by placing the ribbon files in a firm or environment folder (not in the project folder). For example, the administrator can create company ribbons and save them in the firm folder. These ribbons will be displayed in the Tekla Structures user interface for all users who use the same firm folder.

Add ribbons to the firm or environment folder

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

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

If you cannot find the folder, ensure that you are able to view the hidden files and folders (page 337) on your computer.

2. Copy the entire `\Ribbons` folder either to your company's firm folder or to the system folder.

3. If the ribbon contains user-defined commands, create a subfolder named `\Commands` on the same level as the `\Ribbons` folder, and copy the `UserDefined.xml` file from the `..\Users\<user>\AppData\Local\Trimble\TeklaStructures\<version>\UI\Commands` folder to the `\Commands` folder you just created.

4. Restart Tekla Structures.

Loading order of custom ribbons

Tekla Structures loads the ribbons in the following order:

1. Tekla Structures default ribbon

2. Company ribbons in the environment folders

3. Company ribbons in the firm folder

4. User-defined ribbons under `%localappdata%`

Note that the ribbons which are loaded later will override previously loaded ribbons that have the same configuration + editing mode combination. For example, a ribbon defined in the firm folder will take precedence over the ribbons in the environment folders.

If you have a customized ribbon in the `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UI\Ribbons` folder, it will take precedence over company ribbons. To override this, open the Ribbon editor and click **Restore**. The ribbon in the environment or firm folder will now be used. Alternatively, you can remove or rename your own customized ribbons.

Naming convention for ribbon files

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

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

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

Configuration identifier	Name
`albl_up_Construction_Modeling`	**Construction Modeling**
`albl_up_Developer`	**Developer**
`albl_up_Drafter`	**Drafter**
`albl_up_Educational`	**Educational**
`albl_up_Engineering`	**Engineering**
`albl_up_Full`	**Full**
`albl_up_PC_Detailing`	**Precast Concrete Detailing**
`albl_up_Rebar_Detailing`	**Rebar Detailing**
`albl_up_Steel_Detailing`	**Steel Detailing**
`albl_up_Tekla_Structures_Primary`	**Primary**
`albl_up_Viewer`	**Project Viewer**

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

4.4 Distribute customized tabs using a firm or environment folder

As an alternative to customized ribbon files, which override the existing ribbon, you can import external custom tabs to the ribbon. The customized tabs are automatically appended to the end of the ribbon for all users who use the same firm or environment folder. This means that an administrator can distribute customizations to all users in the company while still allowing individual users to customize their ribbons as well.

Note that these customized tabs do not appear in the Ribbon editor, so the users are not able to edit them. If the administrator has updated the contents of a customized tab, the users will receive an update when they restart Tekla Structures. Tabs are not configuration specific, so they are imported regardless of the user's Tekla Structures license. If the tab contains commands that are not available in the user's configuration, they will appear dimmed on the ribbon.

1. Create the following folder structure in your company's firm folder or in the system folder.
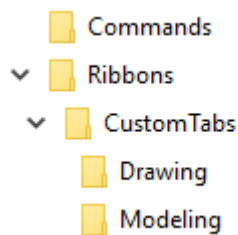
2. In the Ribbon editor, create a customized tab and add some commands to it.

3. Save the ribbon.

4. Go to the `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UI\Ribbons` folder.

5. In a text editor, open the ribbon file which contains the tab you wish to share with other users.

6. Remove all the other content from the ribbon file except the first row and the description of the tab you wish to share.

   For example:

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

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

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

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

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

   ---

8. If the tab contains user-defined commands, copy the `UserDefined.xml` file from the `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UI\Commands` folder to the `\Commands` folder created in step 1.

9. Restart Tekla Structures.

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

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

Company administrators can distribute the customized property pane layouts to other users in the company by placing the property pane layout file `PropertyTemplates.xml` in a folder called `PropertyRepository \Templates` in a project, firm, or environment folder. For example, company administrators can create company property pane layouts and save them in the firm folder. These property panes are available in the Tekla Structures user interface for all users who use the same firm folder.

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

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

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

   If you cannot find the folder, ensure that you are able to view the hidden files and folders (page 337) on your computer.

2. Create a folder called `PropertyRepository\Templates` either in your company's project folder, firm folder, or in the system folder.

3. Copy the `PropertyTemplates.xml` file to the `PropertyRepository \Templates` folder.

4. Restart Tekla Structures.

Search order of the customized property pane layout files

The `PropertyTemplates.xml` file contains all the property pane layouts for different object types. Note that the property pane layouts for different object types are treated separately. For example, Tekla Structures can read the

property pane layout for steel beam from a different location than the property pane layout for steel column.

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

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

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

Company administrators can distribute the customized property pane settings to other users in the company. Place the `PropertyPaneSettings.xml` file in a folder called `\PropertyPane` in a project, firm, or environment folder.

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

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

   If you cannot find the folder, ensure that you are able to view the hidden files and folders (page 337) on your computer.

2. Create a folder called `\PropertyPane` either in your company's project folder, firm folder, or in the system folder.

3. Copy the `PropertyPaneSettings.xml` file to the `\PropertyPane` folder.

4. Restart Tekla Structures.

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

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

4.7 Distribute customized toolbars using a project, firm, or environment folder

Company administrators can distribute the customized **Selecting**, **Snapping**, and **Snap override** toolbars to other users in the company. Place the needed toolbar `.json` files in a folder called `\Toolbars` in a project, firm, or environment folder. For example, company administrators can create company toolbars and save them in the firm folder. These toolbars are available in the Tekla Structures user interface for all users who use the same firm folder.

1. Customize the toolbars that you want to share.

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

    If you cannot find the folder, ensure that you are able to view the hidden files and folders (page 337) on your computer.

2. Create a folder called `\Toolbars` either in your company's project folder, firm folder, or in the system folder.

3. Copy the needed `.json` files to the `\Toolbars` folder.

4. Restart Tekla Structures.

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

4.8 Customize the material catalog

The material catalog contains information on material types and grades. In the material catalog, materials are displayed in a hierarchical tree grouped according to their types. Each material type has material grades listed under them.

The following material types are available in Tekla Structures:

*   Steel
*   Concrete
*   Reinforcing bar
*   Timber
*   Miscellaneous

By default, the material catalog contains standard, environment-specific materials. You can add, modify, and delete material grades.

Tekla Structures stores the material information in the `matdb.bin` file.

See also

Important buttons in the material catalog

When you work with the material grades, note the usage of the following buttons in the **Modify Material Catalog** dialog box:

Button	Description
Update	Saves the changes of a single edited material grade to the computer's memory until you click **OK**.
OK	Saves the changes in the model folder. Tekla Structures saves the modified catalog on the hard disk when you click **OK** to close the dialog box and then click **OK** in the **Save confirmation** dialog box.
Cancel	Closes the **Modify Material Catalog** dialog box without saving the changes. Note that all changes made to the catalog will be lost even if you have clicked **Update**, because the changes have not been saved on the hard disk. The changes made to the catalog are visible during one session, because the catalog is using the computer's memory. When you start Tekla Structures the next time, the previous data is restored from the hard disk.

Tekla Structures stores the material information in the `matdb.bin` file. When you first open a model, Tekla Structures reads the data from the hard disk and stores it in the computer's memory.

When you select a material, Tekla Structures reads the data from the computer's memory and displays it in the **Modify Material Catalog** dialog box. This is faster than accessing the data from the hard disk.

Add a material grade

1. On the **File** menu, click **Catalogs** --> **Material catalog** to open the **Modify Material Catalog** dialog box.

2. Select a material type, for example, steel.

3. Right-click and select **Add Grade**.

   A new material grade is added under to the material type you selected.

4. Change the material grade name by clicking the grade and entering a new name for it.

5. Enter the material grade properties.

6. Click **OK** to save the material grade and close the **Modify Material Catalog** dialog box.

7. Click **OK** in the **Save confirmation** dialog box to save the changes.

Copy a material grade

You can add new material grades by modifying a copy of an existing, similar material grade.

1. On the **File** menu, click **Catalogs** --> **Material catalog** to open the **Modify Material Catalog** dialog box.

2. Select a material grade that is similar to the one you wish to create.

3. Right-click and select **Copy Grade**.

   A copy of the material grade with the name **COPY** is added to the material tree.

4. Change the material grade name by clicking the grade and entering a new name for it.

5. Modify the material grade properties.

6. Click **OK** to save the material grade and close the **Modify Material Catalog** dialog box.

7. Click **OK** in the **Save confirmation** dialog box to save the changes.

See also

Modify a material grade

You can modify existing material grades using the material catalog.

1. On the **File** menu, click **Catalogs** --> **Material catalog** to open the **Modify Material Catalog** dialog box.

2. Select a material grade in the tree and modify its properties.

   - Use the **General** tab for entering three alternative names for the material. The names are usually the material names used in different countries or standards. The tab also contains the profile and plate density values.

   - Use the **Analysis** tab for entering information on the properties used in structural analysis.

   - Use the **Design** tab for entering information on the design-specific properties, such as strengths and partial safety factors.

   - Use the **User attributes** tab for creating your own attributes for material grades.

     For example, you can define a paint layer thickness, or the maximum grain size of concrete using a user-defined attribute.

3. When you have finished modifying the material grade, click **Update**.

4. Click **OK** to close the **Modify Material Catalog** dialog box.

   Tekla Structures asks if you want to save the changes to the model folder.

5. Click **OK** in the **Save confirmation** dialog box to save the changes.

   The modified material catalog is saved in the current model folder and is available only for that model. To make the modified catalog available for all the other models, use export and import.

See also

Delete a material grade

1. On the **File** menu, click **Catalogs** --> **Material catalog** to open the **Modify Material Catalog** dialog box.

2. Select the material grade that you want to delete.

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

4. Click **OK** to close the **Modify Material Catalog** dialog box.

5. Click **OK** in the **Save confirmation** dialog box to save the changes.

See also

Add user attributes to material grades

You can add user attributes and their values to the material grades. The user attributes can then be used, for example, in filtering.

1. On the **File** menu, click **Catalogs** --> **Material catalog** to open the **Modify Material Catalog** dialog box.

2. On the **User attributes** tab, click **Definitions** to open the **Modify Material Properties** dialog box.

3. Click **Add** to add a new row.

4. To define a user attribute, click each item on a row.

    a. In the **Category** list, select a material category to which the user attribute is applied.

    b. In the **Design code** list, select a design code to which the attribute is added.

    c. In the **Material type** list, select a material type for the attribute.

    d. In the **Quantity type** list, select the type of information that the user attribute contains, for example, weight, area, ratio, or string.

    e. In the **Order** column, define the order in which the user attributes are shown in the dialog box. Smaller values are shown first.

    f. In the **Property name** column, define a name for the property.

        The name is saved in the catalog and can be used in reports and templates. When **Property name** is used in a template,

`MATERIAL.PROPERTY_NAME` indicates where the property name appears.

g. In the **Label** column, define a label for the attribute.

5. Click **Update**.

6. Click **OK** to close the **Modify Material Properties** dialog box.

See also

Create user-defined material definitions

You can replace the existing material definitions with your own definitions and use them, for example, in drawing part marks. Material definitions can contain text, numbers and symbols.

1. Save the symbol file `user_material_symbols.sym` in the symbol folder (usually the folder `..\ProgramData\Trimble\Tekla Structures \<version>\environments\common\symbols\`).

2. Create a text file that contains your material definitions.

   Create the file using a text editor, for example Microsoft Notepad.

   Each row in the file defines a material. Use the following syntax: `material_name symbol_file_name@n`, where

   - `material_name` is the name of the material used in the material catalog

   - `symbol_file_name` is the symbol file name to be used

   - `n` is the number of the symbol.

   For example:

   ```
   S235JRG1 user_material_symbols@1 B
   S235JRG2 user_material_symbols@2 C
   S235JR   user_material_symbols@0 A
   S275JR   user_material_symbols@3 D
   S355JR   user_material_symbols@4 E
   ```

WARNING	The order of material names in the definition file is relevant to the conversion. Materials with more specific names need to be listed before the ones with similar, but simpler names, for example, S235JRG1 must be listed before S235JR. Otherwise they both get the same symbol.

3. Save the file for example with the name
   `user_material_definitions.txt`.

   All the named materials in the material catalog will be replaced with the ones defined in this file.

4. Set the name of the file as a value for the advanced option
   `XS_MATERIAL_SYMBOL_REPRESENTATION_FILE` in **File menu** -->
   Settings --> **Advanced options** --> **Drawing Properties** as follows:

   ```
   set
   XS_MATERIAL_SYMBOL_REPRESENTATION_FILE=user_material_defi
   nitions.txt
   ```

   You can also enter a full path to the material definition file. Without the path Tekla Structures searches for the file in the model, firm, project, and system folders.

See also

Customize the material catalog (page 131)

Import and export material grades

Use importing and exporting for merging material catalogs. Material catalogs are imported and exported as `.lis` files.

Importing and exporting is useful when you:

- upgrade to a newer version of Tekla Structures and want to use a customized material catalog from a previous version
- want to combine material catalogs that are stored in different locations
- want to share material catalog information with other users
- want to combine material catalogs across different environments.

TIP   You can also download or share material grades using Tekla Warehouse.

See also

Import a material catalog (page 137)

Export an entire material catalog (page 138)

Export a part of the material catalog (page 139)

Units used in import and export (page 152)

Import a material catalog

Material catalogs are imported to Tekla Structures models as `.lis` files. You can move an exported `.lis` file to any model folder and import it to an existing material catalog.

1. Open the model to which you want to import a material catalog.

2. On the **File** menu, click **Catalogs** --> **Material catalog** to open the **Modify Material Catalog** dialog box.

3. Click **Import**.

4. Browse for the folder that contains the import file, and select the file.

5. Click **OK**.

   If a material with a same name as the material being imported already exists, the **Import confirmation** dialog box appears and you have three options:

   - **Replace**: The existing material is replaced with the imported material.

   - **Merge**: Material properties that are different in the import file are added to the existing material. All the other properties remain unchanged.

     Use this option to import only certain elements of the material catalog, such as user attributes.

   - **Leave**: The existing material is not replaced and the material definitions in the import file are ignored.

   If you select the **Apply for all** check box, Tekla Structures uses the same option (**Replace**, **Merge**, or **Leave**) for all the existing materials that have the same name as the one being imported.

   If a user attribute with a different definition already exists, you are prompted to **Replace** or **Leave** the existing attribute.

6. Click **OK** to close the **Modify Material Catalog** dialog box.

7. Click **OK** in the **Save confirmation** dialog box to save the changes.

See also

Export an entire material catalog (page 138)

Export a part of the material catalog (page 139)

Units used in import and export (page 152)

Export an entire material catalog

Exporting and importing are used to merge material catalogs. Material catalogs are exported from Tekla Structures models as `.lis` files. Note that the **Export** command exports the entire catalog.

1. On the **File** menu, click **Catalogs** --> **Material catalog** to open the **Modify Material Catalog** dialog box.

2. Click **Export**.

3. Browse for the folder where you want to save the exported file.

    By default, the file is saved to the current model folder.

4. Enter a name for the file and click **OK**.

5. Click **OK** to close the **Modify Material Catalog** dialog box.

6. Click **OK** in the **Save confirmation** dialog box to save the changes.

See also

Import a material catalog (page 137)

Units used in import and export (page 152)

Export a part of the material catalog
If you do not want to export the whole material catalog, you can export a branch of the material tree, meaning all the material grades grouped under one material type, or a single material grade. Material catalogs are exported from Tekla Structures models as `.lis` files.

1. On the **File** menu, click **Catalogs** --> **Material catalog** to open the **Modify Material Catalog** dialog box.

2. Select material grades to be exported.

    - To export a branch of the material tree, right-click the branch and select **Export Grades**.

    - To export a single material grade, right-click the material grade and select **Export Grade**.

3. Browse for the folder where you want to save the export files.

    By default, the file is saved to the current model folder.

4. Enter a name for the file and click **OK**.

5. Click **OK** to close the **Modify Material Catalog** dialog box.

6. Click **OK** in the **Save confirmation** dialog box to save the changes.

See also

Export an entire material catalog (page 138)

Import a material catalog (page 137)

Units used in import and export (page 152)

4.9 Customize the profile catalog

The profile catalog contains information on profiles, their rules and types, and the analysis and design properties of the profiles. Profiles are displayed in a hierarchical tree grouped according to rules.

By default, the profile catalog contains standard, environment-specific profiles and generic parametric profiles. You can add, modify, import, export, and delete profiles.

You can define your own user-defined profiles, which can be either fixed or parametric. Use the profile catalog to create new fixed profiles, either from scratch or by copying an existing one. Use the sketch editor or `.clb` files to create new parametric profiles.

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

See also

Important buttons in the profile catalog

When you work with the profiles, note the usage of the following buttons in the **Modify Profile Catalog** dialog box:

Button	Description
Update	Saves the changes of a single edited profile to the computer's memory until you click **OK**.
OK	Saves the changes in the model folder. Tekla Structures saves the modified catalog on the hard disk when you click **OK** to close the dialog box and then click **OK** in the **Save confirmation** dialog box.

Button	Description
Cancel	Closes the **Modify Profile Catalog** dialog box without saving the changes.
	Note that all changes made to the catalog will be lost even if you have clicked **Update**, because the changes have not been saved on the hard disk. The changes made to the catalog are visible during one session, because the catalog is using the computer's memory. When you start Tekla Structures the next time, the previous data is restored from the hard disk.

Tekla Structures stores the information of fixed profiles in the `profdb.bin` file. When you first open a model, Tekla Structures reads the data from the hard disk and stores it in the computer's memory.

When you select a profile, Tekla Structures reads the data from the computer's memory and displays it in the **Modify Profile Catalog** dialog box. This is faster than accessing the data from the hard disk.

See also

Customize the profile catalog (page 139)

Group profiles together

In the profile catalog, the profiles are displayed in a hierarchical tree and they are grouped according to rules , such as the profile type (for example, **I profiles**) and the profile subtype (for example, **HEA**). To change how the profiles are grouped in the profile tree, you need to modify the rules.

The order in which you create the rules does not matter, only the location of the rules in the profile tree.

Tekla Structures reads the rules from top to bottom in the profile tree. Profiles are in the highest group where they meet the criteria defined in the rule. For example, a rule that collects **All profiles** overrides all rules that are below it in the profile tree.

See also

Add a rule to the profile catalog (page 141)

Modify a rule in the profile catalog (page 142)

Add a rule to the profile catalog

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

2. Right-click any existing rule and select **Add Rule**.

   The **Profile manager rules** dialog box appears.

3. Define the rule properties.

   a. Enter a rule name in the **Rule name** box.

   b. Select the **Profile type** to which the rule is applied.

   c. Enter the **Name filter string** that defines the new rule.

      By default, the wildcard symbol (*****) is entered, meaning "all entries".

      For example, to group all catalog entries with names beginning with A, enter `A*` in the **Name filter string** box, or to group all catalog entries with names containing 100, enter `*100*`. Tekla Structures groups the catalog entries that meet your criteria under the new rule.

4. Click **OK** to close the **Profile manager rules** dialog box.

5. Click **OK** to close the **Modify Profile Catalog** dialog box.

6. Click **OK** in the **Save confirmation** dialog box to save the changes.

TIP You can add a next level rule that creates a subgroup under an existing rule. Use the **Add Next Level Rule** command to add the next level rule.

See also

[Modify a rule in the profile catalog (page 142)](#)

Modify a rule in the profile catalog

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

2. Right-click any existing rule and select **Edit Rule**.

   The **Profile manager rules** dialog box appears.

3. Modify the rule properties.

4. Click **OK** to close the **Profile manager rules** dialog box.

5. Click **OK** to close the **Modify Profile Catalog** dialog box.

6. Click **OK** in the **Save confirmation** dialog box to save the changes.

Profiles in the profile tree are listed in an alphabetical order, and rules are listed in the order you specify. To change the order in which the rules appear, use the **Move up** and **Move down** commands.

TIP If you want to delete a rule, right-click an existing rule and select **Delete Rule**.

Add user attributes to profiles

You can add your own attributes to profiles. For example, you can specify paint layer thickness, define the maximum grain size of concrete, sort out different profile types by material, or create profile aliases for converting imperial profiles to metric and vice versa.

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

2. On the **User attributes** tab, click **Definitions**.

   The **Modify Profile Properties** dialog box appears.

3. Click **Add** to add a new row.

4. To define a user attribute, click each item on a row.

   a. In the **Profile type** list, select a profile type to which the user attribute is applied.

   b. In the **Quantity type** list, select the type of information that the user attribute contains, for example, weight, area, ratio, or string.

   c. In the **Order** list, define the order in which the user attributes are shown in the dialog box. Larger values are shown first.

   d. In the **Property name** list, define a name for the property.

      The name is saved in the catalog and can be used in reports and templates. When **Property name** is used in a template, `PROFILE.PROPERTY_NAME` indicates where the property name appears. For example, `PAINT_LAYER_THICKNESS`.

   e. In the **Symbol** column, define an abbreviation that can be used for the property, such as `Ix` or `ct`.

   f. In the **Label** column, define a label for the attribute.

5. Click **Update**.

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

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

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

In this example, you will add a user attribute for I profiles' rule.

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

2. On the **User attributes** tab, click **Definitions**.

   The **Modify Profile Properties** dialog box appears.

3. Click **Add** to add a new row.

4. Select the row that was created and modify the properties as follows:

   - Set **Profile type** to **I profiles**.

   - Set **Quantity type** to **String**.

   - Set **Property name** to `HISTORICAL_PROFILE`.

   - Set **Symbol** to `Hist`.

   - Set **Label** to `Historical profile`.
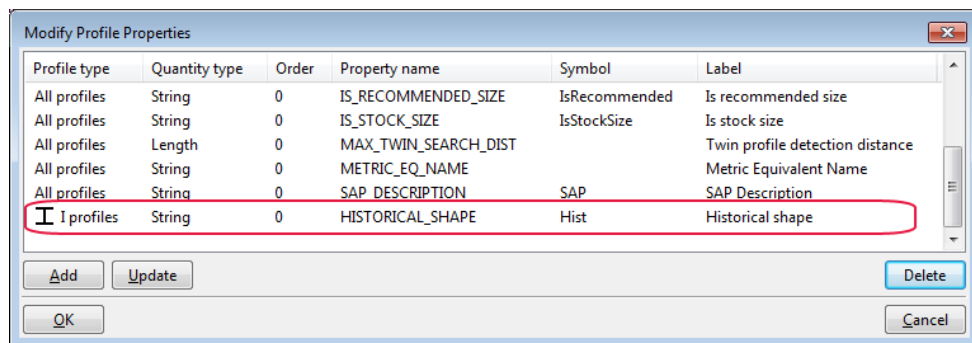
5. Click **Update** and **OK**.

6. In the profile tree, select **I profiles** and then **HEA**.

7. Right-click and select **Add Next Level Rule**.

8. In the **Profile manager rules** dialog box, set the rule properties as follows:

   - Set **Rule name** to `Historical profiles`.

   - In **Profile type**, clear the **All profiles** check box and select the **I profiles** check box.

   - Enter `HEA*` in the **Name filter string** box.

- Set **User attribute** to **HISTORICAL_PROFILE** and **Equals**, and enter `Yes` in the box next to the two other boxes.
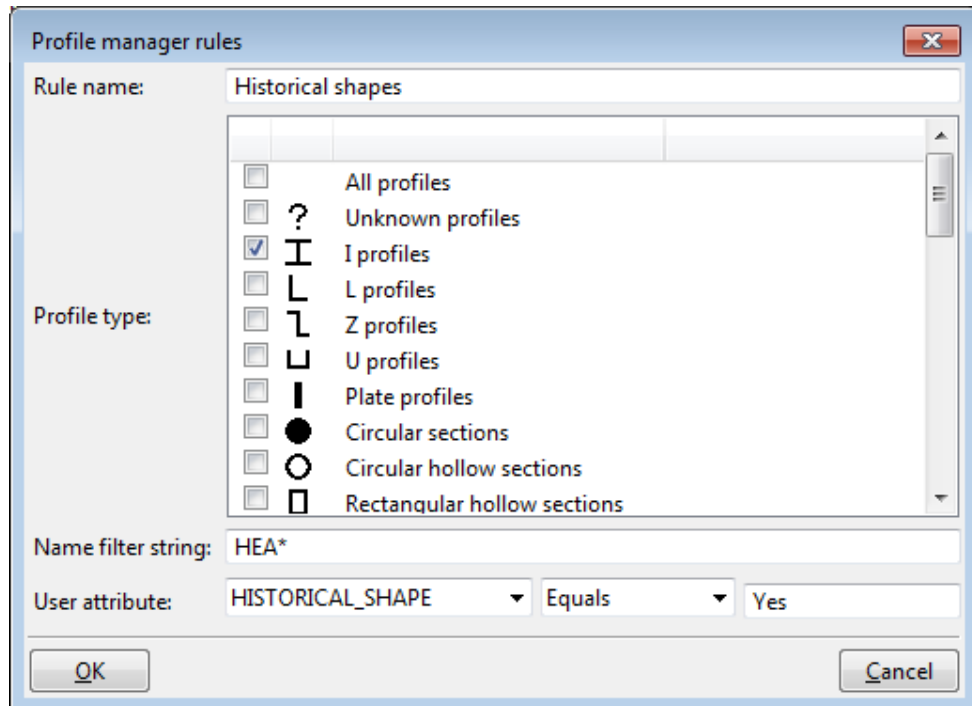
9. Click **OK**.

   Historical profiles appears in the profile tree.

10. Select the required historical profile, for example **HEA120**, in the profile tree.

11. Go to the **User attributes** tab and set **Value** of **Historical profile** to `Yes`.
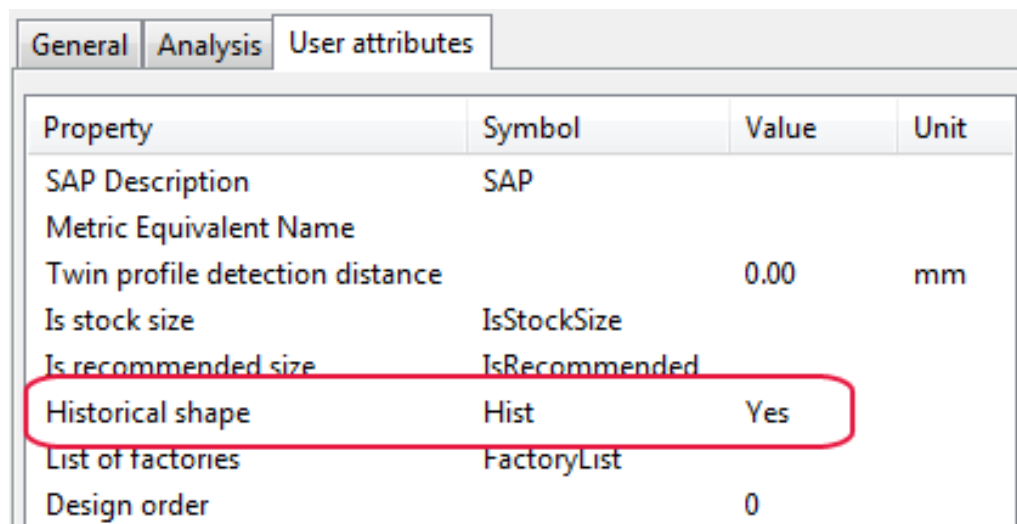
12. Click **Update**.

13. Repeat the steps 10 and 11 for any other required profiles.

14. Click **OK** to close the **Modify Profile Catalog** dialog box.

15. Click **OK** in the **Save confirmation** dialog box to save the changes.

Next time you open the profile catalog, the profiles appear under **Historical profiles** in the profile tree.

See also

Add user attributes to profiles (page 143)

Add a rule to the profile catalog (page 141)

Associate profile types with a certain material

You can define which profiles are available for steel parts, concrete parts, or both. This affects which profile types are shown in the **Select Profile** dialog box when you change the material of a part.

To define the material of a profile type:

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

2. Select a profile type, for example, **L profiles**.

3. To associate the profiles with steel, right-click and select **Material** --> **Steel** .

A check mark next to **Steel** indicates that the profiles are available for
steel parts.
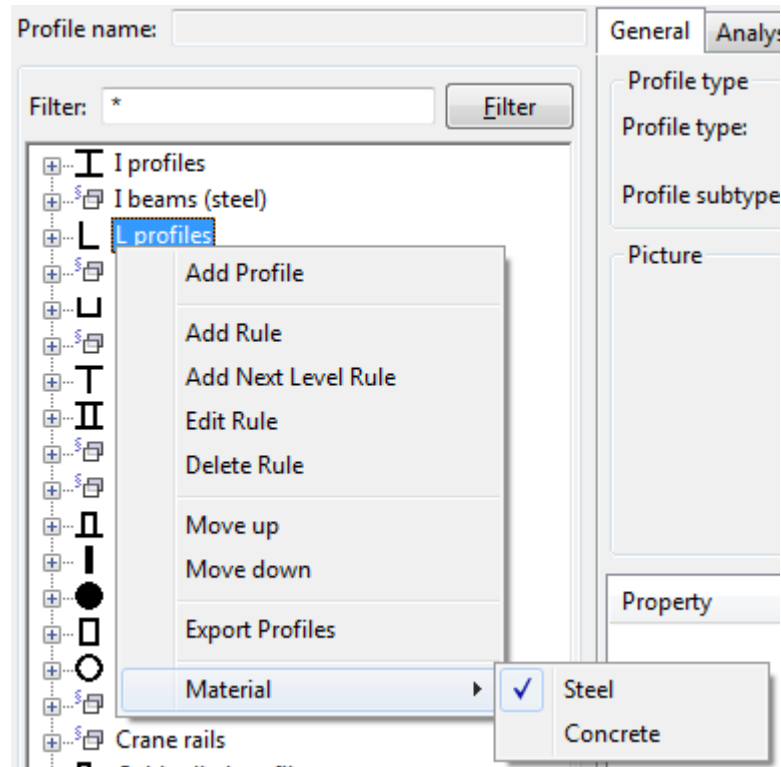
4. To make the selected profiles available also for concrete parts, right-click
   and select **Material** --> **Concrete** .

   If needed, you can remove the check mark by clicking the material again.

5. Click **OK** to close the **Modify Profile Catalog** dialog box.

6. Click **OK** in the **Save confirmation** dialog box to save the changes.

Delete a profile from the profile catalog

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

2. Select the profile that you want to delete.

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

4. Click **OK** to close the **Modify Profile Catalog** dialog box.

5. Click **OK** in the **Save confirmation** dialog box to save the changes.

Tekla Structures will continue showing parts in model views using the deleted
profiles until you modify the parts or reopen the model. After that, the parts

having profiles that are not available in the profile catalog, are shown as sticks without a profile.

See also

[Customize the profile catalog (page 139)](#)

Import and export profiles

Use importing and exporting for merging profiles across profile catalogs. Profile catalogs are imported and exported as `.lis` files, sketched profiles as `.uel` files, and user-defined parametric profiles as `.clb` files.

When you export an entire profile catalog, Tekla Structures creates three separate files: `profiles.clb`, `profiles.lis` and `rules.lis`. The `.clb` file contains parametric profile definitions, if they are used in the profiles in the catalog, otherwise it is empty. The `profiles.lis` file includes the actual profile definitions and the `rules.lis` file the branch rules. When you export a branch of a profile catalog, the branch name is attached as prefix to the file names.

Importing and exporting is useful when you:

- upgrade to a newer version of Tekla Structures and want to use a customized profile catalog from a previous version
- want to combine profile catalogs that are stored in different locations
- want to share profile catalog information with other users
- want to combine profile catalogs across different environments.

Limitations

- You cannot import or export hard-coded profiles such as PROFILE_ZZ, PROFILE_CC, and PROFILE_CW.
- You cannot import profiles that do not have a defined cross section.
- If you have used a sketched profile or a user-defined parametric profile as the cross section for a fixed profile, you also need to import the sketched profile or the user-defined parametric profile to the new model.

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

See also

[Export an entire profile catalog (page 150)](#)

[Export a part of the profile catalog (page 150)](#)

[Import profile catalog items (page 149)](#)

[Import and export sketched profiles (page 154)](#)

Import profile catalog items

Tekla Structures has five types of profile catalog items: fixed profiles, hard-coded parametric profiles, sketched profiles, user-defined parametric profiles, and rule sets. Profiles and rule sets are imported to Tekla Structures models as `.lis` files, sketched profiles as `.uel` files, and user-defined parametric profiles as `.clb` files.

If you are importing an entire profile catalog or a branch, we recommend that you save the related files in a separate folder. This makes the import process faster.

1. Open the model to which you want to import profile catalog items.

2. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Modify Profile Catalog** dialog box.

3. Click **Import** to import a single file, or **Import Directory** to import the contents of a file folder.

4. Select the import file or the import folder.

5. Click **OK**. Tekla Structures checks if there are duplicates in the profile names in the import file compared to the profile catalog.

   a. If the **Review import items** dialog box appears, there are duplicate profile names and you must select each duplicate and assign the action you want to perform with the following buttons:

      • **Leave**: The existing profile item is not replaced and the profile definitions in the import file are ignored.

      • **Merge**: Profile properties that are different in the import file are added to the existing profile. All the other properties remain unchanged.

        Use this option to import only certain elements of the profile catalog, such as user attributes.

      • **Replace**: The existing profile item is replaced with the imported profile item.

      • If you leave **Unknown** as the action for a profile item, it is not imported.

      You can select more than one profile item at a time by using the **Shift** and **Ctrl** keys and assign the same action to the entire selection.

      NOTE Each cross section definition has a unique name and ID number. If during an import, a cross section with the same name but different properties is found in the existing profile catalog, the cross section being imported is renamed by adding an incremental number at the end of the existing name.

      ---

b. After you have selected the actions, click **Continue** to perform them.

6. Click **OK** to close the **Modify Profile Catalog** dialog box.

7. Click **OK** in the **Save confirmation** dialog box to save the changes.

See also

Import and export profiles (page 148)

Export an entire profile catalog (page 150)

Export a part of the profile catalog (page 150)

Import sketched profiles (page 154)

Units used in import and export (page 152)

Export an entire profile catalog

Profile catalogs are exported from Tekla Structures models as `.lis`, `.uel`, and `.clb` files.

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

2. Click **Export**.

3. Browse for the folder where you want to save the export files.

    By default, the files are saved to the current model folder. For faster profile catalog import, we recommend that you create a separate subfolder for the catalog files.

4. Click **OK** to close the **Modify Profile Catalog** dialog box.

See also

Import and export profiles (page 148)

Export a part of the profile catalog (page 150)

Example of profile export file (page 151)

Import profile catalog items (page 149)

Units used in import and export (page 152)

Export a part of the profile catalog

If you do not want to export an entire profile catalog, you can export a branch of the profile tree, meaning all the profiles grouped under one rule, or a single profile. Profiles and rule sets are exported from Tekla Structures models as `.lis` files, sketched profiles as `.uel` files, and user-defined parametric profiles as `.clb` files.

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

2. Select profiles to be exported.

   - To export a branch of the profile tree, right-click the branch and select **Export Profiles**.

   - To export a single profile, right-click the profile and select **Export Profile**.

3. Browse for the folder where you want to save the export files.

   By default, the files are saved to the current model folder.

   If you are exporting a single profile, enter a name for the file.

4. Click **OK**.

5. Click **OK** to close the **Modify Profile Catalog** dialog box.

See also

Example of profile export file

The export `.lis` file is divided into specific sections.

The first row in the file is `PROFILE CATALOG EXPORT VERSION = n`, where `n` is the version number.

WARNING Do not delete this row. If the row does not appear in the file, the import is canceled.

The next section defines the hierarchical tree structure that is used to display the contents of the catalog.

The next section contains the profiles.

Fixed profiles

```
PROFILE_NAME = "HEA120";
{
TYPE = 1; SUB_TYPE = 1001; COORDINATE = 0.000;
{
"FLANGE_SLOPE_RATIO"        0.000000000E+000
"ROUNDING_RADIUS_2"         0.000000000E+000
"ROUNDING_RADIUS_1"         1.200000000E+001
"FLANGE_THICKNESS"          8.000000000E+000
"WEB_THICKNESS"             5.000000000E+000
"WIDTH"                     1.200000000E+002
"HEIGHT"                    1.140000000E+002
```

Fixed user-defined profiles

Fixed user-defined profiles can have more than one cross section. The profile type for fixed user-defined profiles is 998. SUB_TYPE refers to the name of the cross section definition. When importing fixed user-defined profiles, the relevant cross section definitions must be in the same import file as the profile.

```
PROFILE_NAME = "TAN_HK_TEST_2_CS";
{
TYPE = 998; SUB_TYPE = 253; COORDINATE = 0.000;
        {
"EQUIVALENT_TYPE"        11
"FLANGE_SLOPE_RATIO"     0.000000000E+000
"ECCENTRICITY_Y"         0.000000000E+000
"ECCENTRICITY_X"         0.000000000E+000
"ROUNDING_RADIUS_2"      0.000000000E+000
"FLANGE_THICKNESS_2"     0.000000000E+000
"WEB_THICKNESS_2"        0.000000000E+000
```

Cross section definitions

```
CROSS_SECTION_NAME = "MY_OWN_PROFILE"
POINT_NUMBER = 1;
POINT_X =   200.00;
POINT_Y =  -200.00;
CHAMFER_TYPE = 0;
CHAMFER_X =   0.00;
CHAMFER_Y =   0.00;
POINT_NUMBER = 2;
POINT_X =   200.00;
POINT_Y =   200.00;
CHAMFER_TYPE = 0;
CHAMFER_X =   0.00;
CHAMFER_Y =   0.00;
```

See also

Units used in import and export

The table below lists the units Tekla Structures uses when importing and exporting profile catalogs and material catalogs.

Type	Unit (if blank, no unit)
Boolean	
Integer	
String	
Ratio	

Type	Unit (if blank, no unit)
Strain	
Angle	degree
Length	mm
Deformation	mm
Dimension	mm
Radius of inertia	mm
Area	mm^2
Reinforcement area	mm^2
Transverse reinforcement area	mm^2/m
Area/unit length	mm^2/m
Volume	mm^3
Section modulus	mm^3
Moment of inertia	mm^4
Torsion constant	mm^4
Warping constant	mm^6
Force	N
Weight	kg
Distributed load	N/m
Spring constant	N/m
Mass/length	kg/m
Surface load	N/m^2
Strength	N/m^2
Stress	N/m^2
Modulus	N/m^2
Density	kg/m^3
Moment	Nm
Distributed moment	Nm/m
Rotation spring constant	Nm/rad
Temperature	K (ºC)
Thermal dilation coefficient	1/K (1/ºC)
Factor	

See also

Import and export sketched profiles

To use a sketched profile in other Tekla Structures models, you have to export the profile to a file (`*.uel`), and then import the file into another Tekla Structures model.

We recommend that you use the profile catalog to import and export sketched profiles. You can also use the **Applications & components** catalog to import sketched profiles together with related custom components.

See also

Import sketched profiles

After you have exported sketched profiles to a file, you can import them to another Tekla Structures model.

1. Open the Tekla Structures model you want to import to.

2. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Modify Profile Catalog** dialog box.

3. Click **Import**.

4. In the **Import Profile Catalog** dialog box, select `*.uel` from the **Filter** list.

5. Select the file to import.

6. Click **OK**.

7. Click **OK** to close the **Modify Profile Catalog** dialog box.

8. Click **OK** in the **Save confirmation** dialog box to save the changes.

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

See also

Export sketched profiles

1. Open the Tekla Structures model you want to export from.

2. On the **File** menu, click **Catalogs** --> **Profile catalog** to open the **Modify Profile Catalog** dialog box.

3. Right-click the profile you want to export and select **Export Profile**.

4. In the **Export Profile Catalog** dialog box, enter a name for the export file in the **Selection** box.

5. If you want to save the export file to a specific location, browse for the folder.

   By default, Tekla Structures saves the export file in the current model folder.

6. Click **OK**.

See also

Import sketched profiles (page 154)

Create your own profiles

You can create your own profiles and save them in the profile catalog.

Use any of the following methods to create user-defined profiles in Tekla Structures:

Profile type	Creation methods
Fixed profile	• Create user-defined cross sections (page 155)
	• Create a fixed profile (page 161)
	• Create a fixed profile by copying (page 163)
	• Create a fixed profile based on a parametric profile (page 164)
Parametric profile	• Create parametric profiles using .clb files (page 165)
	• Create parametric profiles by sketching (page 173)
Parametric profile with variable cross sections	• Create parametric profiles with variable cross sections (page 198)

Create user-defined cross sections

User-defined cross sections can be used for creating fixed profiles. Define the needed cross sections before creating the profile.

Use any of the following methods to define a cross section:

- Define a cross section using polygon.

  Use this method to create a cross section with fixed dimensions.

- Define a cross section using a plate.

  Use this method if you have a contour plate in the model.

- Define a cross section using a DWG file.

  Use this method if you have a `.dwg` file of the profile you want to define.

Define a cross section using polygon
Define a cross section by picking the shape of the cross section.

1. On the **File** menu, click **Catalogs** --> **Define profiles** --> **Define cross section using polygon**.

2. Define a cross section without or with inner contours.

    - To create a cross section with no inner contours:

    a. Pick the corner points of the cross section to define the shape. Start at the bottom-right corner and pick the points counter clockwise.

    b. Pick the start point and click the middle mouse button to close the shape.

   c. Pick the center point of the cross section.
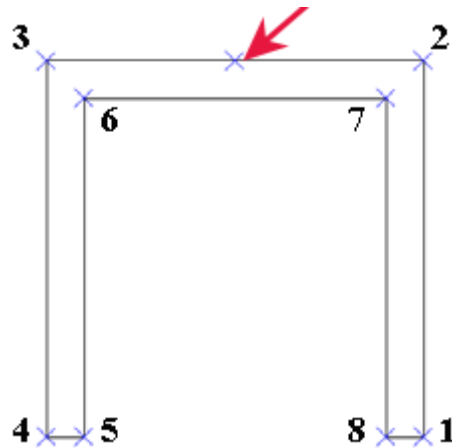
TIP To make it easier to define the shape, insert a reference model of the cross section in the model, and use the

reference model as a basis for picking the cross section shape.

Alternatively, you can create a few construction lines or points in the model and use them to define the cross section shape.

If you do not have any actual points to pick, picking the center point of the cross section becomes difficult. This is because the cross section shape disappears after you have clicked the middle mouse button to close the shape.

- To create a cross section with inner contours:

  a. Pick the corner points of the cross section to define the shape.

  b. Pick the start point to close the shape.

  c. Pick the corner points of the cross section inner contour.

  d. Pick the start point to close the shape

  e. Repeat until you have picked all inner contours.

  f. Click the middle mouse button.

  g. Pick the center point of the cross section.
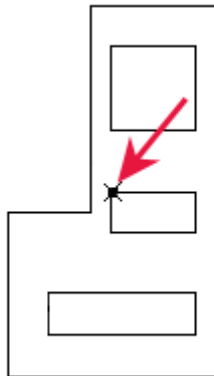
3. When the **User Profile Cross Section** dialog box appears, enter a name for the cross section.

4. Click **OK** to close the **User Profile Cross Section** dialog box.

5. Click **OK** in the **Save confirmation** dialog box to save the changes.

You can then use this cross section when you add a new profile to the profile catalog. The **Profile type** will be **User-defined, fixed**.

Define a cross section using a plate

You can define a cross section using a contour plate.

1. Create a contour plate that includes all the chamfers.

2. On the **File** menu, click **Catalogs** --> **Define profiles** --> **Define cross section using plate**.

   The **Profile Cross-Section from Plate (10)** dialog box appears.

3. On the **Parameters** tab, enter a name in the **Section name** and **Profile name** boxes.

   Other properties are optional.

4. Click **OK**.

5. Select the contour plate.

   Tekla Structures creates the cross section with the shape of the contour plate.

   You can then use this cross section when you add a new profile to the profile catalog. The **Profile type** will be **User-defined, fixed**.

Properties: Profile cross-section from plate (10)

Use the **Parameters** tab to define the profile properties in the **Profile cross-section from plate (10)** component.

Option	Description
Section name	Name of the cross section shown in the **Modify Profile Catalog** dialog box.
	If you leave this box empty, no profile is created.
Profile name	Name of the profile shown in the **Beam** properties, and in the **Modify Profile Catalog** dialog box.
	If you leave this box empty, no profile is created.
Save to	The location of the profile catalog.
	Select one of the following options:
	• **Model directory**: The current model folder.
	• **Global directory**: `..\ProgramData \Trimble\Tekla Structures \<version>\environments \<environment>\profil`
	• **Do not save**: Does not save the profile. This is useful for testing.

Option	Description
Min distance between points	The minimum distance between the corner points of the cross section.
	To create simpler drawings of complicated cross sections, increase this value.
Center point offset	The origin of the plate defines the location of the profile reference line.
	Enter an offset value to move the reference line, relative to the cross section.
Coordinate system	Select one of the following options:
	• **Use local**
	• **Use global xy-plane**
Mirroring	Select one of the following options:
	• **Do not mirror**
	• **Mirror to x-direction**
	• **Mirror to y-direction**
	• **Mirror to x- and y-direction**

Define a cross section using a DWG file

If a cross section is available in DWG format, you can import the cross section and add it as a DWG profile to the profile catalog.

Tekla Structures supports DWG files that have been created using version ACAD2012 or earlier.

Before you start defining a cross section using a DWG file:

• Save the outline of the cross section as a DWG file. Ensure that the DWG file only contains the outline of the profile.

• Make sure that the cross section is created as a closed polyline.

• Make sure that the outline consists of only one closed polyline. You cannot, for example, define holes to your cross section with this method. If you need holes or openings, use the polygon or the plate creation method.

• Remove hatching and unnecessary lines from the DWG file. Tekla Structures imports all the lines it finds in the DWG file.

• If there are blocks in the DWG file, they must be exploded.

1. Open a model.

2. On the **File** menu, click **Catalogs** --> **Define profiles** --> **Define cross section using DWG file**.

   The **DWG Profile to Library (6)** dialog box appears.

3. On the **Parameters** tab, browse for the DWG file.

4. Define the cross section properties.

5. Click **OK**.

6. In the model, pick the start and the end points of the cross section to be imported.

   Tekla Structures imports the cross section and places the profile reference line at the origin of the DWG file.

   You can then use this cross section when you add a new profile to the profile catalog. The **Profile type** will be **User-defined, fixed**.

Properties: DWG Profile to Library (6)

Use the **Parameters** tab to define the profile properties in the **DWG profile to library (6)** component.

Option	Description
Input file	Browse for the DWG file to be imported.
Section name	Name of the cross section shown in the **Modify Profile Catalog** dialog box.
Profile name	Name of the profile shown in the **Modify Profile Catalog** dialog box.
Save to	The location of the profile catalog. Select one of the following options: • **Model directory**: The current model folder. • **Global directory**: `..\ProgramData \Trimble\Tekla Structures \<version>\environments \<environment>\profil` • **Do not save**: Does not save the profile. This is useful for testing.
Min distance between points	The minimum distance between the corner points of the cross section. To create simpler drawings of complicated cross sections, increase this value.

Option	Description
Center point offset	The origin of the plate defines the location of the profile reference line.
	Enter an offset value to move the reference line, relative to the cross section.

Modify a user-defined cross section
You can modify cross sections that have been defined using a polygon, a plate, or a DWG file.

1. On the **File** menu, click **Catalogs** --> **Define profiles** --> **Edit Polygon Cross Section**.

    The **Modify Cross Section** dialog box appears.

2. Select the cross section you want to modify.

3. Modify the cross section point properties.

    *   **Number** refers to each point picked when the cross section was created, in numerical order. The first point picked is 1, the second 2, and so on.

    *   **Chamfer** refers to the chamfer shape.

    *   **x:** and **y:** apply to the chamfer type. For example, if you want the chamfer to be equal on both sides of the angle, only enter a value for **x:**.

        For an uneven chamfer, enter values for **x:** and **y:**.

4. Click **Update**.

5. Click **OK** to close the **Modify Cross Section** dialog box.

6. Click **OK** in the **Save confirmation** dialog box to save the changes.

TIP If you want to delete a cross section, select the cross section and click **Delete**.

Create fixed profiles
You can create new fixed profiles either from scratch or by copying an existing one. You can also convert a parametric profile into a fixed one.

Create a fixed profile
You can create fixed profiles with a single cross section or with multiple cross sections. Note that cross sections affect the total weight of the profile.

WARNING	If you create a profile with multiple cross sections, create the cross sections with the same number of corner points and in the same order.

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

2. Right-click anywhere in the profile tree and select **Add Profile**.

   A new fixed profile with the name **PROFILE1** is created.

3. Change the profile name by entering a new name in the **Profile name** box.

   The profile name must be in upper case letters, with no spaces. Tekla Structures automatically converts lower case letters to upper case letters.

4. In the **Profile type** list, select **User-defined, fixed**.

5. In the **Profile subtype** list, select the cross section you want to use.

   If you have created your own user-defined cross sections (page 155), you can use one of them.

6. Under **Equivalent type**, select a profile type that matches the new cross section as closely as possible. This is important because some connections only work for certain types of profiles.

   The equivalent type and the profile dimensions, such as height and width, affect which connections can be applied to the profile. An unsuitable equivalent type or missing dimension values may result in problems with connections.

7. Click **Update**.

8. Modify the dimension values.

   Always enter values for the dimensions **Height h** and **Width b**, as these values affect how Tekla Structures displays the profiles. If the values are 0, the part is drawn as a line.

9. Under **Cross section**, define a relative location for each cross section:

   a. In the **Number** list, select the number of the cross section.

   b. In the **Relative location** box, enter the location of the cross section.

      This value indicates the location of the cross section along the axis: 0.0 for the start end and 1.0 for the second end. If you only have a single cross section, select 1 for **Number** and enter 0.000 for **Relative location**.

   c. Click **Update** after defining each cross section.

10. Click **Add** to add more cross sections, if needed.

11. If you want to use a different cross section in the profile, select a new one from the **Profile subtype** list.

12. If you want to remove a cross section, select the cross section from the **Number** list and click **Remove**.

13. Click **OK** to close the **Modify Profile Catalog** dialog box.

14. Click **OK** in the **Save confirmation** dialog box to save the changes.

Example

For a pitched profile, you need two cross sections with the same center point height. The **Relative location** value is 0.0 for the first cross section, 0.5 for the second cross section, and 1.0 for the third cross section.

csn = 3
csx = 1.0
cstype = CS1

csn = 2
csx = 0.5
cstype = CS2

csn = 1
csx = 0.0
cstype = CS1
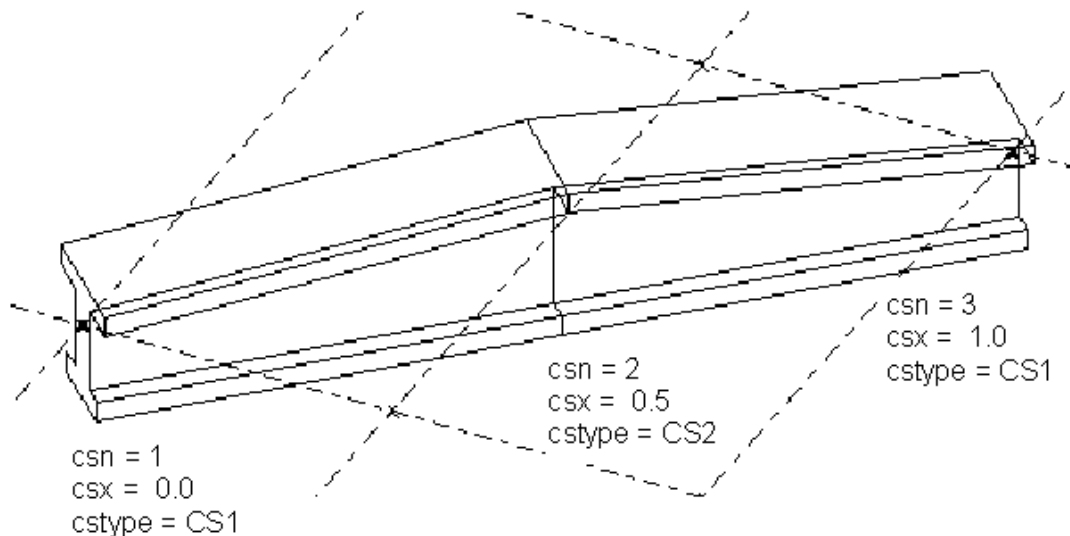
Create a fixed profile by copying
You can create new fixed profiles by modifying a copy of an existing, similar profile.

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

2. Select a fixed profile that is similar to the one you wish to create.

3. Right-click and select **Copy Profile**.

   A new profile with the name **<existing_profile_name COPY>** is created.

4. Change the profile name by entering a new name in the **Profile name** box.

   The profile name must be in upper case letters, with no spaces. Tekla Structures automatically converts lower case letters to upper case letters.

5. Modify the profile properties on the **General**, **Analysis**, and **User attributes** tabs.

   WARNING   Under **Equivalent type**, select a profile type that matches the new cross section as closely as possible. This is important

because some connections only work for certain types of profiles.

Always enter values for the dimensions **Height h** and **Width b**, as these values affect how Tekla Structures displays the profiles. If the values are 0, the part is drawn as a line.

The equivalent type and the profile dimensions, such as height and width, affect which connections can be applied to the profile. An unsuitable equivalent type or missing dimension values may result in problems with connections.

6. Click **Update**.

7. Click **OK** to close the **Modify Profile Catalog** dialog box.

8. Click **OK** in the **Save confirmation** dialog box to save the changes.

Create a fixed profile based on a parametric profile

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

2. Select a parametric profile from the list.

3. Right-click and select **Add Profile**.

   A new standard fixed profile is created, and it has the profile values of the parametric profile.

Modify a fixed profile
If necessary, you can modify existing fixed profiles using the profile catalog. Note that the fixed profiles conform to industry standards, and you should not modify them unless you are an administrator.

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

2. Select a fixed profile 🔷 in the tree and modify its properties.

   • The **General** tab contains information on profile types and dimensions.

   • The **Analysis** tab contains information on the properties used in structural analysis. The structure can be analyzed with different analysis software.

   • The **User attributes** tab is for viewing or entering user attributes for profiles.

3. When you have finished modifying the profile, click **Update**.

4. Click **OK** to close the **Modify Profile Catalog** dialog box.

   Tekla Structures asks if you want to save the changes to the model folder.

5. Click **OK** in the **Save confirmation** dialog box to save the changes.

Create parametric profiles using .clb files

You can create new parametric profiles using `.clb` files.

Follow the example workflow below to create a parametric profile with `.clb` files.

How the .clb, components.clb and profitab.inp files work together

When you create new parametric profiles using this method, you need the following three files:

*   **.clb**

    This file contains the cross section definitions. Create a new `.clb` file in the `..\ProgramData\Trimble\Tekla Structures\<version>\environments\common\inp` folder for each parametric profile you define.

*   **components.clb**

    This file contains a list of all `.clb` files that contain cross section definitions. When you create a new `.clb` file, you need to add its file name to the `components.clb` file located in the `..\ProgramData\Trimble\Tekla Structures\<version>\environments\common\inp` folder.

*   **profitab.inp**

    This file is the link between the `.clb` files and the profile catalog. This file contains a list of all parametric profiles available in Tekla Structures. The file controls how the parametric profiles are displayed in the **Modify Profile Catalog** dialog box. When you want to take a new parametric profile into use, you must add the needed profile definitions, such as the profile type, prefix and the unit of measurement, to the `profitab.inp` file. The `profitab.inp` file is located under the environment folder in `..\ProgramData\Trimble\Tekla Structures\<version>\environments\<environment>\`. The exact file location may vary depending on the folder structure of your environment files .

    Tekla Structures searches for the `profitab.inp` file in the standard search order and then from the folder indicated by the advanced option `XS_PROFDB`.

Define the shape and point coordinates of the profile

Start by defining the shape and point coordinates of the new profile.

1. Design the profile on a paper.

    a. Draw the cross section outline.

    b. Add the needed corner points.

c. Add the needed dimensions.

d. Place the y-z coordinate axis center point to the middle of the cross section.
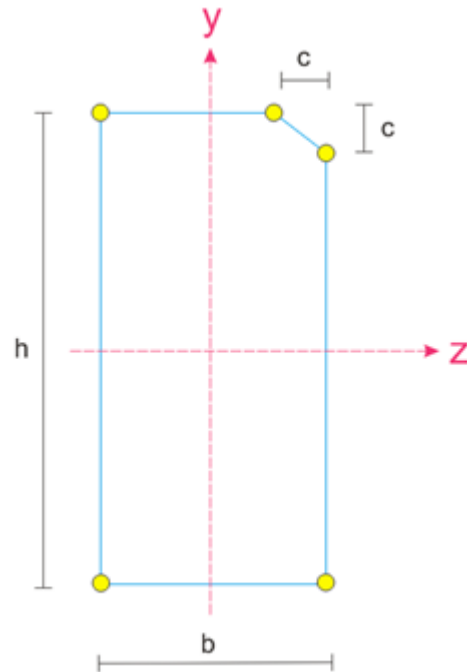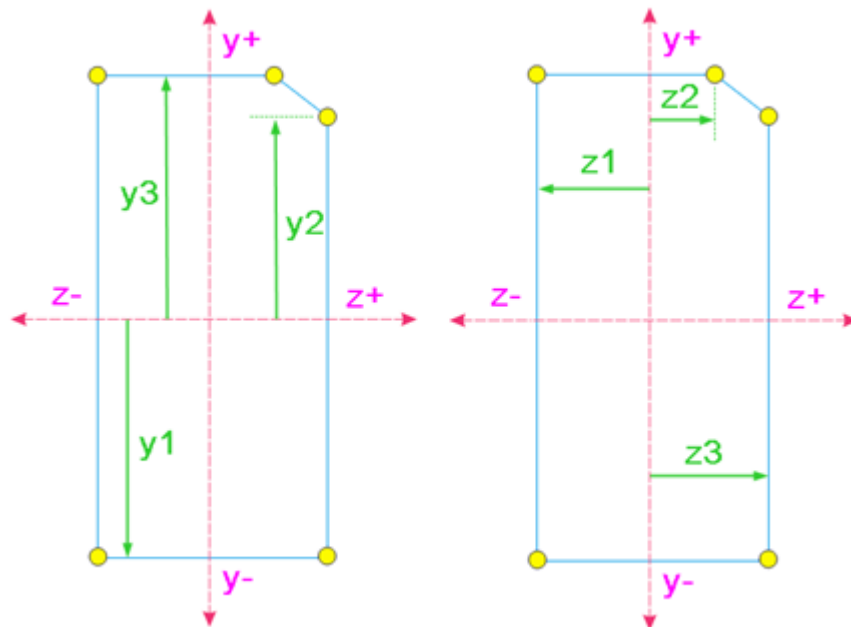

2. Define the y and z coordinate directions. For example:

- positive y axis: up
- negative y axis: down
- positive z axis: on the right
- negative z axis: on the left
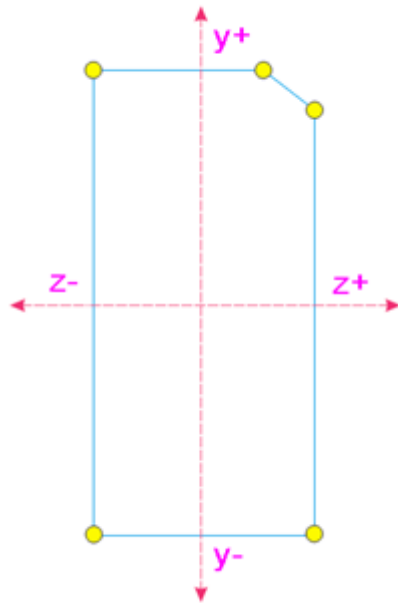
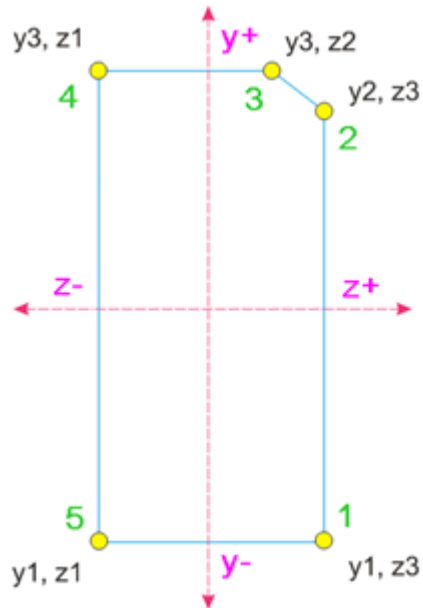3. Define the y and z vectors. For example:
   - y1, y2, y3
   - z1, z2, z3

4. Make coordinate pairs to the points.

Assign y, z vector pairs to each point. Start from the lower right corner and define the points in the counter clockwise order. For example:

- point 1: y1 z3
- point 2: y2 z3
- point 3: y3 z2
- point 4: y3 z1
- point 5: y1 z1

Create the .clb file

After defining the shape and point coordinates of the profile, you can continue by creating the actual `.clb` file.

1. Create a new `.clb` file using any standard text editor, for example Microsoft Notepad.

2. Define a library name that will be used in the `profitab.inp` file for this profile.

   For example:

   ```
   library_id "1Gen"
   ```

3. Define a cross section name that will be used in the `profitab.inp` file for this profile.

For example:

```
Section_type
{
name "RectChamfer"
```

4. Define the dimensions of the cross section.

   For example:

```
base_attribute
{
name "h"
description "albl_Height"
type dimension
default 1000
}
```

5. Define the coordinates of the profile.

   The coordinates must be the same as the y and z vectors that you defined earlier. Define the default values. For example:

```
expression
{
 name "y1"
type y
 default -400
formula -h/2
}
```

6. Define the geometry of one or several faces of the profile.

For example:

```
geometry
{
name "default"
face
 {
 index 0
 point 0 y1 z3
 point 0 y2 z4
 point 0 y3 z4
 point 0 y4 z3
 point 0 y4 z2
 point 0 y3 z1
 point 0 y2 z1
 point 0 y1 z1
 }
face
 {
 index 1
 point 1 y5 z7
 point 1 y6 z8
 point 1 y7 z8
 point 1 y8 z7
 point 1 y8 z6
 point 1 y7 z5
 point 1 y6 z5
 point 1 y5 z6
 }
 }
```

NOTE The index number refers to the point number: 0=start point of the beam, 1=end point of the beam.

---

7. Save the `.clb` file in the `..\ProgramData\Trimble\Tekla Structures\<version>\environments\common\inp` folder.

8. Open the `components.clb` file.

9. Add your profile definition to the `components.clb` file by adding the following line:

```
Include
"new_file_name.clb" // give comment
```

10. Save the `components.clb` file.

Add profile definitions to the profitab.inp file
Before taking the new parametric profile into use, you must add the needed profile definitions to the `profitab.inp` file.

1. Find the `profitab.inp` file, located under the environment folder in `..\ProgramData\Trimble\Tekla Structures\<version>\environments\<environment>\`.

2. Copy the `profitab.inp` file to a model, project or firm folder.

3. Open the file in the new location using a standard text editor, such as Microsoft Notepad.

4. Under a suitable category, add a new line for the profile definition.

   Use the following syntax:

```
Prefix
! Type ! SO ! Z ! MI ! MA ! G3-NAME ! Z3-NAME !
```

5. Save the file.

   The profile is now available in the profile catalog. You may have to restart Tekla Structures for the change to take effect.

Example

An example of a profile definition:

```
PNL_A
! USER ! 0 ! ! 2 ! 3 !1Gen.RectChamfer !h*b-[c]
```

Properties used in profitab.inp

Use the following properties when you define new parametric profiles using the `profitab.inp` file:

Property	Description
`Prefix`	Prefix of the parametric profile. The prefix is shown in the profile catalog.
	For example, `PNL_A`.
`Type`	Type of the parametric profile.
	The profile types are/include the following:
	I, L, Z, U, PL, D, PD, P, C, T, HK, HQ, ZZ, CC, CW, CU, EB, BF, SPD, EC, ED, EE, EF, EZ, EW, 102, 103, 104, 105, 106, USER
	For example, in the default environment, parametric profiles with prefixes PD, EPD, CHS, CFCHS, O, Ø, and TUBE all group under the type PD, and appear under **Circular hollow sections** in the profile catalog.
`SO`	Sorting order. The options are:
	• `-1`: Decreasing sorting order
	• `+1`: Increasing sorting order

Property	Description
	• `0`: No sorting order
	• `-2`: Name increasing, value decreasing
	• `+2`: Value increasing, name decreasing
	For example, if your profile is PLT200*10 or PLT10*200 and the sorting order is `+2`, the result in the output (such as a report) for both cases is PLT200*10. If the sorting order is `-2`, the result for both cases is PLT10*200.
`Z`	Unit of measurement. The options are:
	• `0`: millimeters
	• `1`: inches
	• `2`: feet
	• `3`: centimeters
	• `4`: meters
`MI`	Minimum number of parameters you can use with the parametric profile.
	For example, the rectangular hollow section SHS has the following **Profile subtypes**: **h*t**, **h*b*t**, **h1*b1-h2*b2*t**. If you define SHS with a minimum of two and a maximum of two parameters, you will only have the option **h*t** available in the **Select Profile** dialog box.
`MA`	Maximum number of parameters you can use with the parametric profile.
`G3-NAME`	Refers to a cross section file (`.clb` file).
	Can be a combination of a library id and the name of a cross section, separated by a full stop. For example, `1Gen.RectChamfer`.

Property	Description
Z3-NAME	Defines how the profile parameters relate to the parameters in the cross section file.
	Parameters in the order of appearance in the `.clb` file, optional parameters in square brackets. For example, `h*b-[c]`.
	Can also be the name of the detailing component.

Create parametric profiles by sketching

You can create parametric user-defined profiles by sketching. You can change the dimensions of parametric profiles each time you use them in a model.

• Use the cross section sketch editor to create and modify sketched profiles.

• The **Sketch Browser** shows the objects of a sketched profile.

• Use the **Variables** dialog box to define the properties of a sketched profile.

Open the sketch editor

1. Open a Tekla Structures model.

2. On the **File** menu, click **Editors** --> **Define cross section in sketch editor**.

   Tekla Structures opens the sketch editor, the **Sketch Browser**, and the **Variables** dialog box.

   When you first open the sketch editor, the view is empty. The grid coordinates and labels that you see in the sketch editor depend on the grid properties of your actual Tekla Structures model.
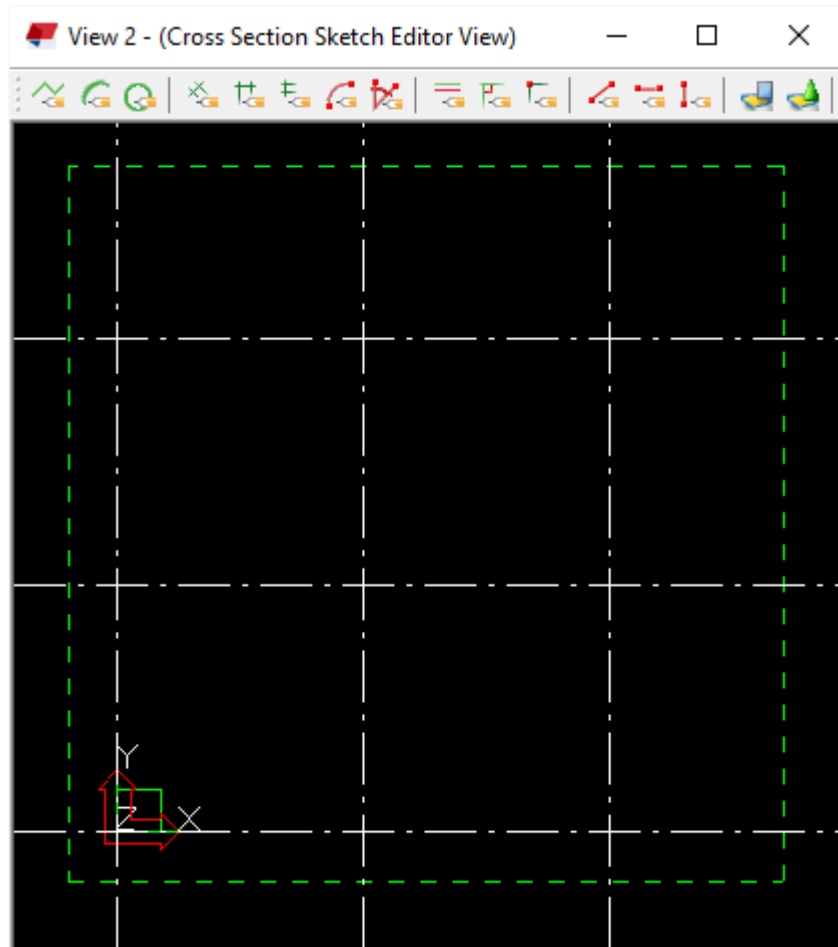
Sketch Browser

The **Sketch Browser** shows the objects (lines, arcs, circles, constraints, dimensions, and chamfers) of a sketched profile in a hierarchical, tree-like structure. The **Sketch Browser** automatically opens when you open the sketch editor.

When you click an object in the sketch editor, Tekla Structures highlights the object in the **Sketch Browser**, and vice versa.
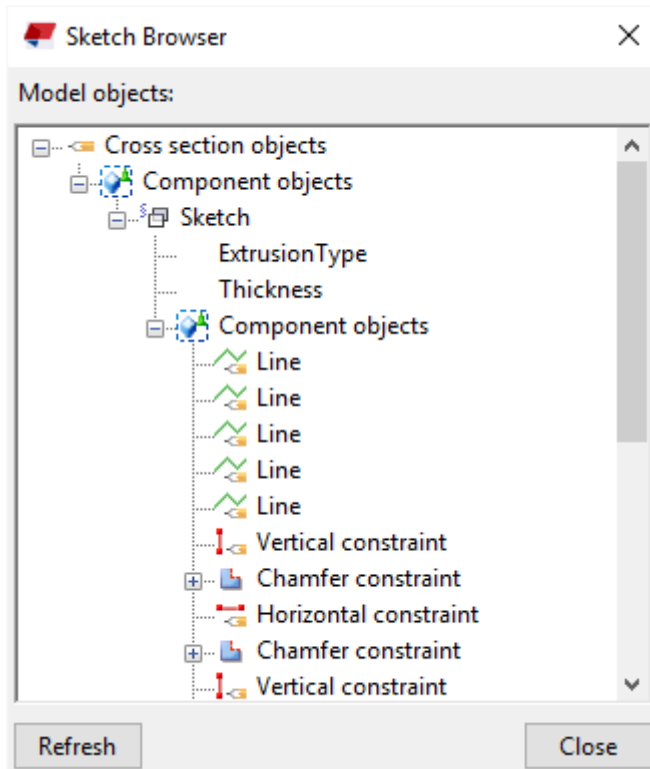
The **Sketch Browser** displays the following information about a sketched profile:

- Extrusion type (0, 1, or 2) and thickness of the sketched profile
- Lines, arcs, and circles
- Constraints
- Distances and dimensions and their values
- Chamfers and their type (0=**None**, 1=**Line** ... 7=**Line and arc**) and dimensions.

Variables in sketched profiles
Use the **Variables** dialog box to define the properties of a sketched profile. Variables can define fixed properties, or they can include formulas, so that Tekla Structures calculates the property value each time you use the profile in a model.

The **Variables** dialog box automatically opens when you open the sketch editor.

Name	Formula	Value	Value type	Variable type	Visibility	Label in dialog box
h1	300.00	300.00	Length	Distance	Show	Height
h2	70.00	70.00	Length	Distance	Show	Height
h3	=h2	70.00	Length	Distance	Hide	Height
b1	150.00	150.00	Length	Distance	Show	Width
b2	=b1	150.00	Length	Distance	Hide	Width
P1	20.00	20.00	Length	Parameter	Show	Thickness
P2	10.00	10.00	Length	Parameter	Show	Chamfer
a1	270.00	270.00	Angle	Angle	Hide	Angle

Category: Sketch parameters

Add   Delete   Close

NOTE The **Variables** dialog box functions the same way as the corresponding dialog box in the custom component editor. For more information on how to use variables, see .

Sketch the outline of a profile
When you create a new sketched profile, start by sketching the outline and the holes of the profile using lines, arcs, and circles.

Ensure that you create a closed shape, unless you are creating a profile of a consistent thickness, such as a cold-rolled profile.

Sketch a polyline
You can create line segments in the sketch editor by picking points. Tekla Structures automatically creates coincident constraints between the line segments and displays a chamfer symbol where line segments meet.

1. Open the sketch editor. (page 173)

2. Click the **Sketch polyline** button: .

3. Pick points to create each line segment.

4. Click the middle mouse button to create the polyline.
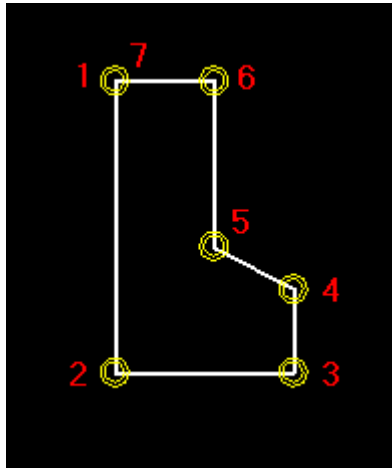
Sketch an arc
You can create an arc in the sketch editor by picking three points.

1.

2. Click the **Sketch arc** button: .

3. Pick three points to define the arc.

> **TIP** You can use the advanced option XS_CS_CHAMFER_DIVIDE_ANGLE to define the smoothness of the arc.

Sketch a circle
You can create a circle in the sketch editor by picking two points.

1.

2. Click the **Sketch circle** button: .

3. Pick a point to indicate the center of the circle **(1)**.

4. Pick a point to indicate the radius of the circle **(2)**.
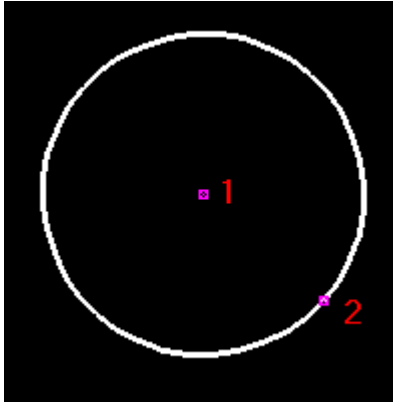
Refine the shape of a sketched profile by adding a constraint
After you have sketched the outline of a profile, use *constraints* to refine your sketch and lock the shape. For example, you can straighten lines, create 90 degree angles, force lines to meet, close the shape, and add chamfers in corners.

To straighten the entire profile, use horizontal and vertical constraints in conjunction with other constraints. Although the shape is locked, you can still rotate the profile in the model.

Add a parallel constraint
You can force two lines in a sketched profile to be parallel to each other.

Before you start, sketch the outline of the profile in the sketch editor. (page 176)

1. Click the **Parallel constraint** button: .

2. Select a line in the sketch **(1)**.

3. Select another line in the sketch **(2)**.
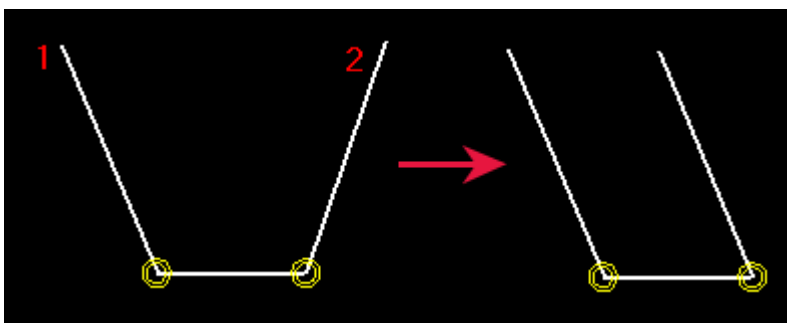
Add a perpendicular constraint

You can force a line in a sketched profile to be at a 90 degree angle to another line you select. The lines do not have to intersect.

Before you start, sketch the outline of the profile in the sketch editor. (page 176)

1. Click the **Perpendicular constraint** button: .

2. Select a line in the sketch **(1)**.

3. Select another line in the sketch **(2)**.
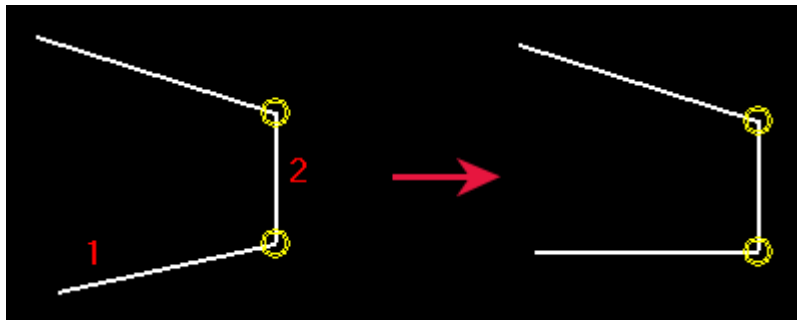

Add a coincident constraint

You can force two lines in a sketched profile to start or end at the same point, by extending or shortening one or both lines. The lines do not have to intersect.

NOTE Tekla Structures automatically creates coincident constraints

- where two lines meet.

- between line segments when you draw them with the **Sketch polyline** tool.

- between the start of the first line segment and the end of the last line segment in a shape, if they are within a certain distance of each other.

Before you start, sketch the outline of the profile in the sketch editor. (page 176)

1. Ensure that the **Snap to end points** snap switch is active.

2. Click the **Coincident constraint** button: .

3. Pick the end of the first line **(1)**.

4. Pick the end of the second line **(2)**.
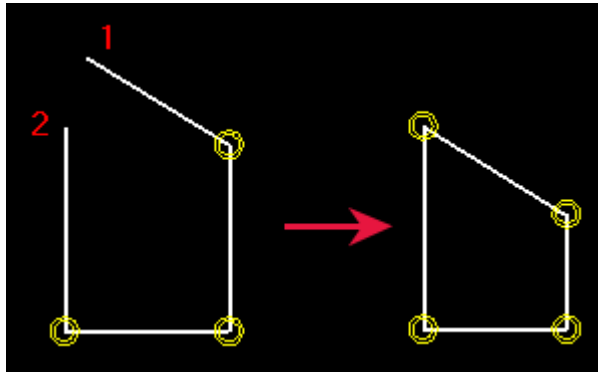
Add a fixed constraint

You can lock the position and angle of a line in a sketched profile so that other constraints do not affect it.

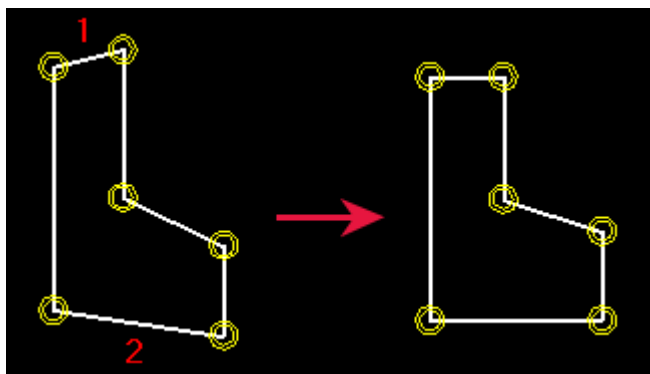Before you start, sketch the outline of the profile in the sketch editor. (page 176)

1. Click the **Fixed constraint** button: .

2. Select a line in the sketch.

Add a horizontal constraint

Use horizontal constraints to force a line in a sketched profile to be parallel to the local x axis. Tekla Structures automatically creates horizontal constraints when you create lines that are nearly horizontal.

Before you start, sketch the outline of the profile in the sketch editor. (page 176)

1. Click the **Horizontal constraint** button: .

2. Select the lines you want to straighten **(1, 2)**.

Add a vertical constraint

Use vertical constraints to force a line in a sketched profile to be parallel to the local *y* axis. Tekla Structures automatically creates vertical constraints when you create lines that are nearly vertical.

Before you start, sketch the outline of the profile in the sketch editor. (page 176)

1. Click the **Vertical constraint** button: ![button]

2. Select the lines you want to straighten **(1, 2)**.
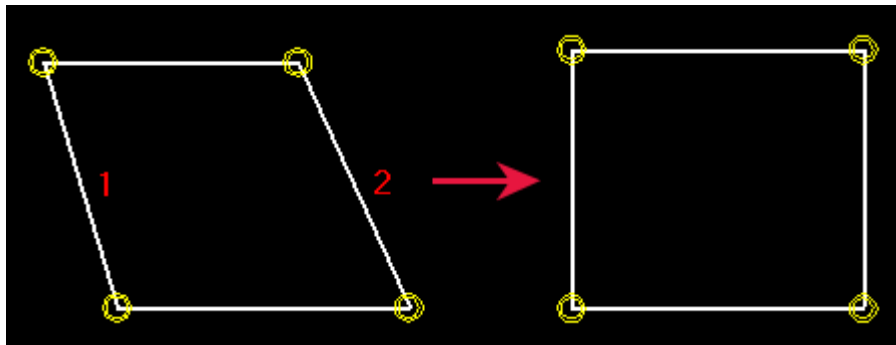
Delete a constraint

You can delete constraints from sketched profiles.

1. Click ![icon] to open the **Sketch Browser**.

2. Select the constraint you want to delete.

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

4. Click **Refresh**.

Add dimensions to a sketched profile

After you have sketched a profile, use dimensions to make different distances in the profile parametric. You can use these dimensions to define the size of the profile when you use it in a model.

Tekla Structures also adds the dimensions you create to the list of variables that you can use in calculations.

NOTE Do not create too many dimensions in a sketch, or the dimensions will not be able to adjust when the values are changed.

In the following example, if you create the dimension marked in red, the dimension b1 will no longer work:
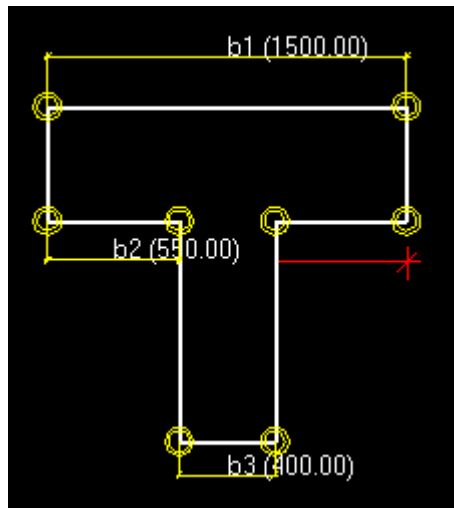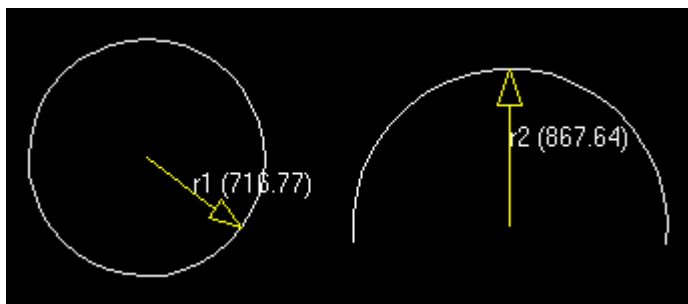

Add a radial dimension to a sketch

You can create a radial dimension for an arc or a circle in a sketched profile.

Before you start, sketch the outline of the profile in the sketch editor. (page 176)

1. Click the **Sketch radial dimension** button: .

2. Select the arc or circle.

Add an angle dimension to a sketch

You can create an angle dimension between two lines in a sketched profile. The angle is calculated counter clockwise from the first line you select.

Before you start, sketch the outline of the profile in the sketch editor. (page 176)

1. Click the **Sketch angle dimension** button: .

2. Select the first line **(1)**.

3. Select the second line **(2)**.
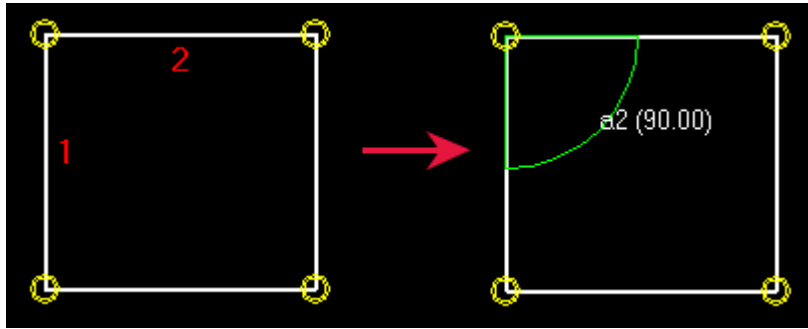
TIP If you are unable to see the angle symbol, scroll with the mouse wheel to zoom in.

Add a dimension between two points in a sketch
You can add a dimension to a sketched profile, between two points you pick.

Before you start, sketch the outline of the profile in the sketch editor. (page 176)

1. Click the **Sketch free dimension** button:
2. Pick a point to indicate the start point of the dimension **(1)**.
3. Pick a point to indicate the end point of the dimension **(2)**.
4. Pick a point to indicate the location of the dimension lines and text.
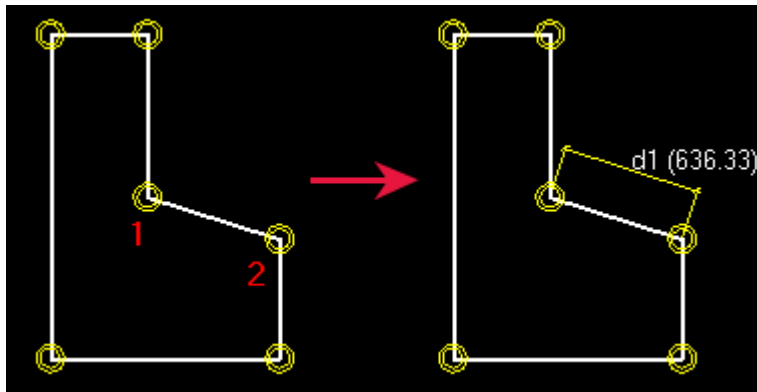
Add a horizontal dimension to a sketch
You can add a horizontal dimension to a sketched profile, between two points you pick.

Before you start, sketch the outline of the profile in the sketch editor. (page 176)

1. Click the **Sketch horizontal dimension** button: .
2. Pick a point to indicate the start point of the dimension **(1)**.

3. Pick a point to indicate the end point of the dimension **(2)**.

4. Pick a point to indicate the location of the dimension lines and text.

Add a vertical dimension to a sketch

You can add a vertical dimension to a sketched profile, between two points you pick.

Before you start, sketch the outline of the profile in the sketch editor. (page 176)

1. Click the **Sketch vertical dimension** button: .

2. Pick a point to indicate the start point of the dimension **(1)**.

3. Pick a point to indicate the end point of the dimension **(2)**.

4. Pick a point to indicate the location of the dimension lines and text.
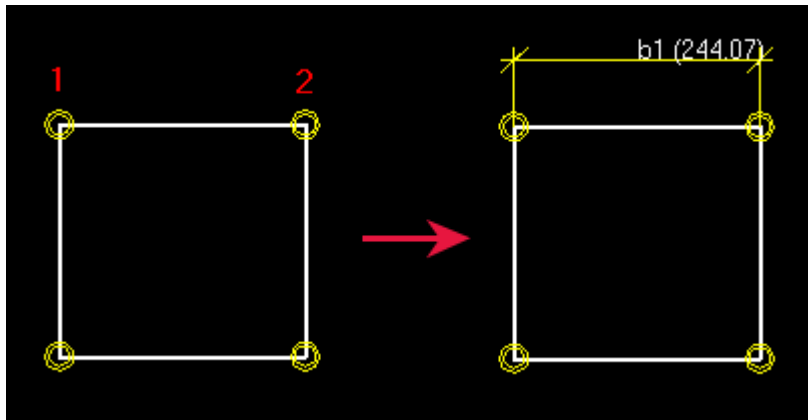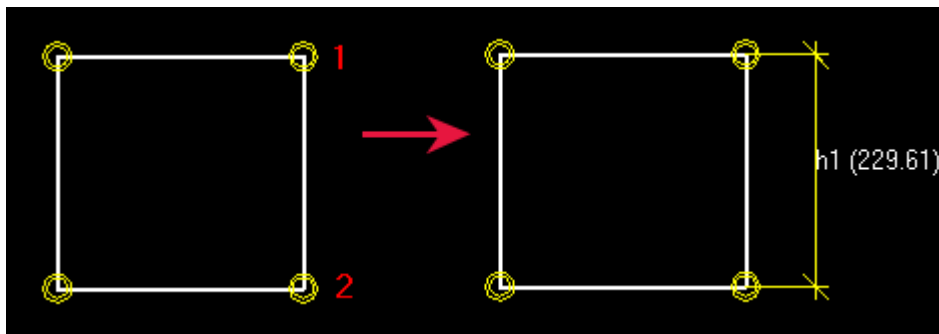

Delete a dimension from a sketch

When you want to delete a dimension from a sketch, you can do it in the sketch editor view, in the **Variables** dialog box, or in the **Sketch Browser**.

1. Select the dimension you want to delete.

2. Do one of the following:

   • In the sketch editor view or in the **Sketch Browser**, right-click and select **Delete**.

- In the **Variables** dialog box, click the **Delete** button.

Define positioning planes for a sketched profile

When you sketch a profile, you can define *positioning planes* for it. With positioning planes you can determine the planes Tekla Structures will use for positioning parts and components.

Part positioning planes

With *part positioning planes* you can determine how Tekla Structures positions parts that have a sketched profile. These planes are used for the **On plane** and **At depth** settings for parts, and also when placing custom components that are bound to boundary planes.

The part positioning planes are displayed in blue:
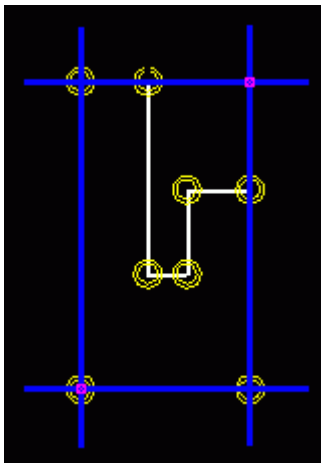
The **On plane** options **Left** and **Right** are set according to the vertical blue planes, and the **Middle** option is halfway between them.

The same principle applies to the **At depth** setting: the **Front** and **Behind** options are set according to the horizontal blue planes, and the **Middle** option is halfway between them.

Example

You can define part positioning planes so that an asymmetric profile will be positioned according to its web only. In the following example, the **Middle** option is illustrated in gray dotted lines:
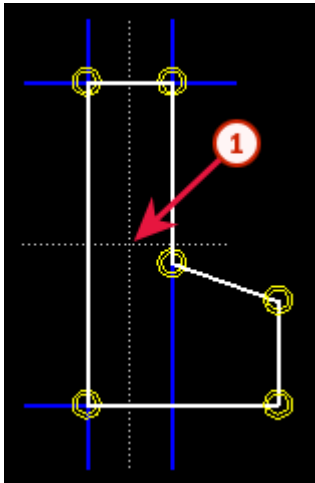
(1) Middle option

Connection positioning planes
With *connection positioning planes* you can determine how Tekla Structures positions components in relation to the component main part that has a sketched profile.

The connection positioning planes are displayed in green:
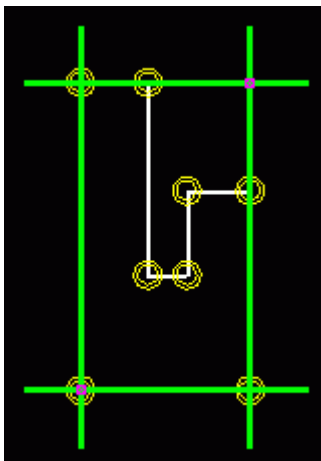
Example

The following image shows the default connection positioning planes of a double tee slab that was created as a sketched profile. The green line illustrates the default connection positioning planes.
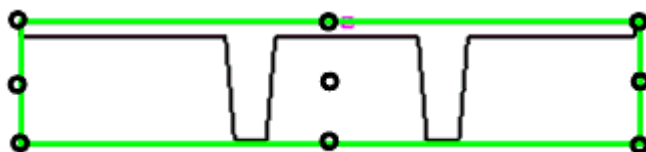
To place connections according to the location of the stems of the double tee, move the connection positioning planes as shown below.
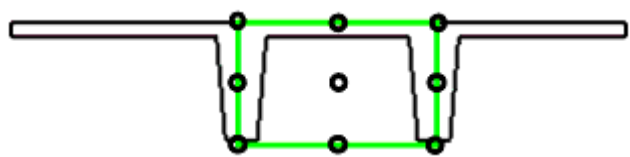
Show and hide positioning planes

To show or hide the positioning planes, do one of the following:

To	Do this
Show or hide **part** positioning planes	Click .
Show or hide **connection** positioning planes	Click .

Move positioning planes

You can move the positioning planes by moving their handles. Note that if you move the handles away from the outmost corners of the sketched profile, you must bind them by adding a dimension to each handle. Otherwise the positioning will not function correctly in the model.

1. Click the positioning plane to display the handles.

   The handles are displayed in pink. By default, the handles are at the outmost corners of the sketched profile. For example:
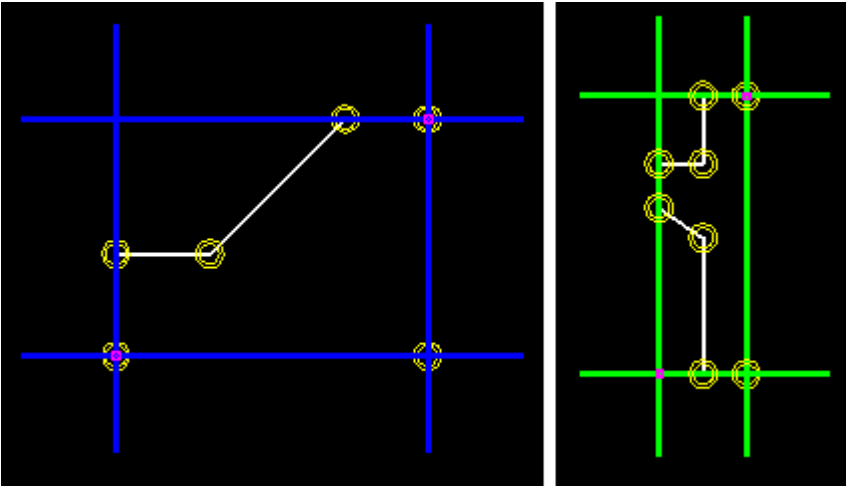
2. Click a handle to select it.

   NOTE The same handle controls both the vertical and horizontal plane, so you can move them both at the same time.

   ---

3. Move the handle like any other object in Tekla Structures.

   For example, right-click and select **Move**.

4. If the handle is not at the outmost corner of the profile, add a dimension between the handle and the corner.

Example

In the following examples, the left handle of the positioning plane has been bound by using a horizontal dimension **(b1)**:
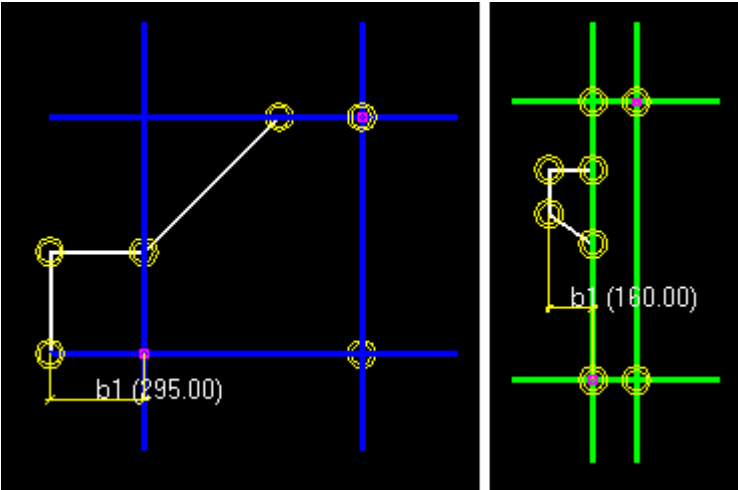
Revert to default positioning planes
You can revert back to the default positioning planes of a sketched profile if you have moved the planes.

To revert to the default positioning planes, do one of the following:

To	Do this
Revert to the default **part** positioning planes	1. Click 🔲 to show the part positioning planes. 2. Select the part positioning planes. 3. Right-click and select **Delete**. 4. Click 🔲 again to check that the planes have reverted back to the default.
Revert to the default **connection** positioning planes	1. Click 🔺 to show the connection positioning planes.

To	Do this
	2. Select the connection positioning planes.
	3. Right-click and select **Delete**.
	4. Click again to check that the planes have reverted back to the default.

Check a sketched profile
You can check that the constraints and dimensions in a sketched profile work correctly.

1.   Double-click a dimension line to open the **Distance Properties** dialog box.

2.   Change the **Value** box.

3.   Click **Modify**.

     Tekla Structures updates the profile in the sketch editor.

4.   Check that the shape of the profile does not change and that the dimensions adjust correctly.

5.   Click **Cancel** to close the **Distance Properties** dialog box.

See also

Use sketched profiles in a model (page 192)

Save a sketched profile
Tekla Structures saves the sketched profiles in the current model folder, in the `xslib.db1` file, which is a library file containing custom components and sketches. Sketched profiles are available in the **Others** section in the profile catalog.

NOTE Note the following limitations when naming sketched profiles:

- You cannot use the name of a fixed profile.

- You cannot include numbers, special characters, or blank spaces in the profile name.

- Lower case letters are automatically converted into upper case letters.

To save a sketched profile, do one of the following:

To	Do this
Save a new profile	1. Click **Save sketch** . 2. Enter a name in the **Prefix** box, and then click **OK**.
Update an existing profile	1. Click **Save sketch** . 2. Click **Yes** when prompted to update the existing cross section.
Save a copy of the profile under a different name	1. Click **Save sketch as** . 2. Enter a new name in the **Prefix** box, and then click **OK**.

See also

Import and export sketched profiles (page 154)

Modify sketched profiles
You can modify existing sketched profiles, for example, by modifying chamfers or dimensions. You can also move corners or holes by moving the handles. The chamfers are moved automatically when you move the handles.

Modify a sketched cross section

NOTE • You cannot change dimensions that have been calculated using formulas in the **Variables** dialog box.

• Constraints may also prevent you from changing dimensions.

---

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

2. Open the **Others** branch at the end of the profile tree.

3. Right-click a sketched profile, and then select **Edit profile** to open the profile in the sketch editor.

4. Double-click a sketch object to modify its properties.

   The sketch objects you can modify appear in yellow.

5. Modify the properties and then click **Modify**.

6. Close the sketch object properties dialog box.

7. Click the **Save sketch as** icon to save the changes.

Modify chamfers in a sketch
You can change the shape and dimensions of chamfers in a sketched profile.
For example, you can create rounded profile corners.

1. Double-click a chamfer symbol in the sketch editor.

2. In the **Chamfer Properties** dialog box, change the shape and dimensions of the chamfer.

3. Click **Modify**.

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

5. Click the **Save sketch as** icon to save the changes.

Set the sketch thickness
If you have sketched an open shape, such as a cold-rolled section, you must define the extrusion type and thickness of the sketch in the **Sketch Browser**. The thickness can be either fixed or parametric.
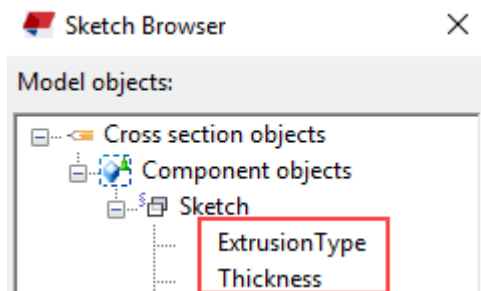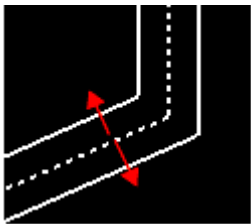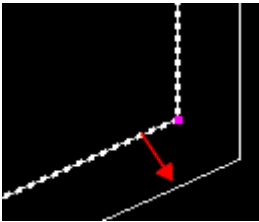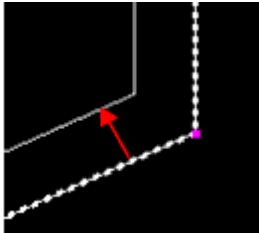
1. In the sketch editor, sketch an open polyline (page 176).

2. Do one of the following:
   - To set a fixed thickness:
     a. In the **Sketch Browser**, right-click **Thickness** and select **Add Equation**.
     b. Enter the value of the thickness after =.
   - To define a parametric thickness:
     a. In the **Variables** dialog box, add a new parameter variable for **Length** (for example, P1).
     b. In the **Formula** column, define the default value for the parameter variable.
     c. In the **Sketch Browser**, right-click **Thickness** and select **Add Equation**.
     d. Enter the name of the parameter variable (for example, P1) after =.

3. To define the extrusion type:

a. In the **Sketch Browser**, right-click **ExtrusionType** and select **Add Equation**.

b. Enter the extrusion type number (0, 1, or 2) after =.

4. Click the **Save sketch as** icon to save the changes.

Extrusion types

The extrusion type defines how a sketched profile of a consistent thickness is extruded. When you change the thickness, the profile grows inwards, outwards, or symmetrically in both directions, depending on the extrusion type. You must define the extrusion type for sketches that consist of an open polyline.

Type	Description	Image
0	The sketch is extruded symmetrically to the outside and inside of the polyline. (Default)	
1	The sketch is extruded to the outside of the polyline.	
2	The sketch is extruded to the inside of the polyline.	

Use sketched profiles in a model

Once you have created a sketched profile and saved it, you are ready to use it in the model. If you have applied constraints correctly, the shape of the profile will be maintained when you change its dimensions.

To use a sketched profile for a new part in a model:

1. Open the part properties in the property pane.

For example, to open the beam properties, on the **Steel** tab, hold down

Shift and click .

2. Click the **...** button next to the **Profile** box.

   The **Select Profile** dialog box appears.

3. Open the **Others** branch at the end of the profile tree.

4. Select a sketched profile.

5. If the profile is parametric, you can define its dimensions in the **Value** column on the **General** tab.

6. Click **OK** to close the **Select Profile** dialog box.

7. Pick points to place the part in the model.

See also

Create an image of a profile (page 201)

Example: Create a symmetric C-shaped profile by sketching
This example shows how to create a sketched profile using variables.

After completing the tasks, you will have a symmetric C-shaped profile with the dimensions b1 = b2 and h2 = h3. When you use the profile in the model, you can change the following dimensions:

- Width (b1)

- Total height (h1)

- Height (h2)

- Thickness (P1)

- Chamfers (P2)
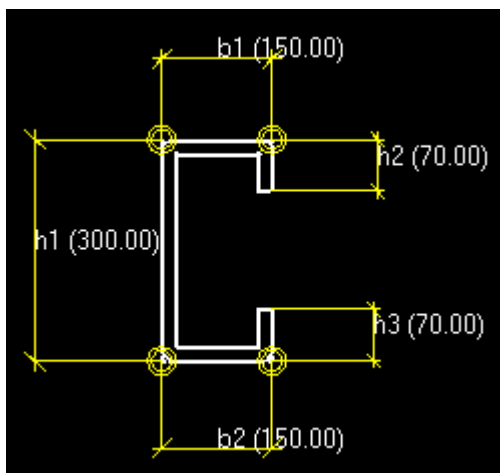
Example: Sketch a C-shaped profile

Start by sketching the outline of the profile.

1. Open the sketch editor.

2. Use the **Sketch polyline** command to create a rough C-shaped profile.

    At this stage, the profile does not have to be symmetric or have the right dimensions.
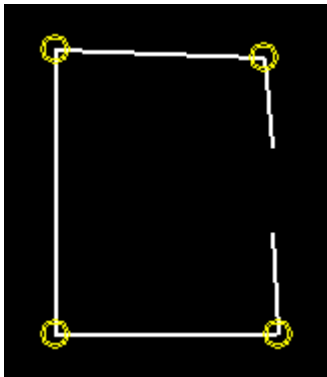
3. Straighten the lines using the **Add horizontal constraint** and **Add vertical constraint** commands.
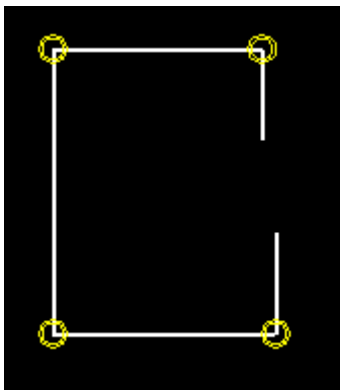
4. Save the profile and name it `CSHAPE`.

Example: Add dimensions to the sketched profile

After sketching the outline of the profile, you can continue by adding dimensions.

1. Use the **Sketch horizontal dimension** command to create the distances b1 and b2.
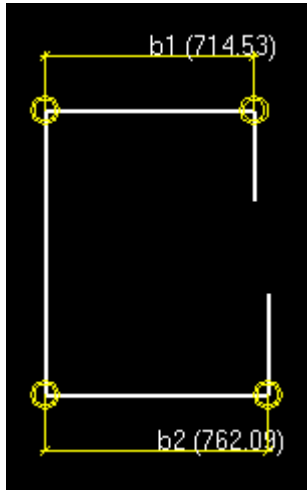
2. Use the **Sketch vertical dimension** ⌶ command to create the distances h1, h2, and h3.
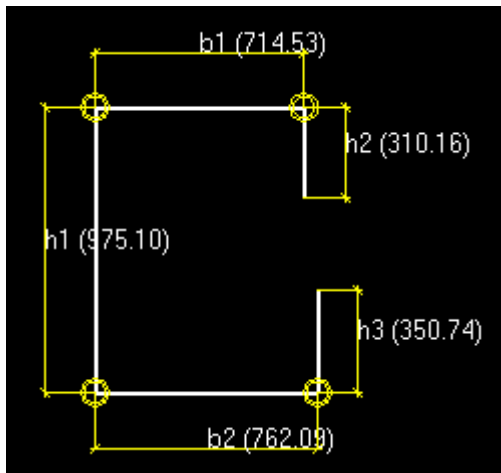
3. In the **Variables** dialog box, enter the following values for the distances:

Name	Formula	Value	Value type	Variable type	Visibility	Label in dialog box
b1	150.00	150.00	Length	Distance	Show	Width
b2	=b1	150.00	Length	Distance	Hide	Width
h1	300.00	300.00	Length	Distance	Show	Height
h2	70.00	70.00	Length	Distance	Show	Height
h3	=h2	70.00	Length	Distance	Hide	Height

4. Ensure that **Visibility** is set to **Show** for the distances b1, h1, and h2.

5. Save the sketched profile.

Example: Set the sketch thickness

After adding dimensions to the sketched profile, you can continue by defining the thickness of the sketch.

1. In the **Variables** dialog box, do the following:

    a. Click **Add** to add a parameter variable P1.

    b. In the **Formula** column, enter `20.00`.

    c. In the **Visibility** column, select **Show**.

    d. In the **Label in dialog box** column, enter `Thickness`.

2. In the **Sketch Browser**, set the thickness using the parameter variable P1.

    a. Right-click **Thickness**, select **Add Equation**, and then enter `=P1`.

    b. Right-click **ExtrusionType**, select **Add Equation**, and then enter `=2` to get the sketch extruded to the inside of the polyline.
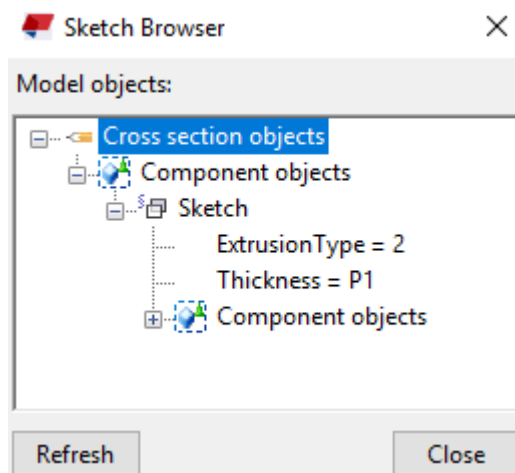
3. Save the sketched profile.

Example: Modify the chamfers of the sketched profile

After setting the thickness of the sketch, you can continue by modifying the chamfers of the sketched profile.

1. In the sketch editor, do the following:

    a. Double-click a chamfer symbol .

    b. In the **Chamfer properties** dialog box, change the chamfer type to **Line** , and then click **Modify**.

    c. Repeat steps 1a–b for all the chamfers.

2. In the **Variables** dialog box, do the following:

    a. Click **Add** to add a parameter variable P2.

b. In the **Formula** box, enter `10.00`.

   c. In the **Visibility** box, select **Show**.

   d. In the **Label in dialog box** box, enter `Chamfer`.

3. In the **Sketch Browser**, do the following:

   a. Double-click **Chamfer constraint** to open the chamfer properties.

   b. Right-click **Chamfer X**, select **Add Equation**, and then enter `=P2`.

   c. Enter the same value for **Chamfer Y**.

   d. Repeat steps 4a–c for all the chamfers.
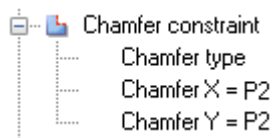
4. Save the sketched profile.

Example: Use the sketched profile in a model

Your sketched profile is now completed and you can use it in a model.

1. Double-click a part to open the part properties in the property pane.

2. Click the **...** button next to the **Profile** box.

   The **Select Profile** dialog box appears.

3. Open the **Others** branch at the end of the profile tree, and select the **CSHAPE** profile.

4. If needed, modify the dimensions of the profile on the **General** tab.

5. Click **OK** to apply the changes.

6. Pick points to place the part in the model.
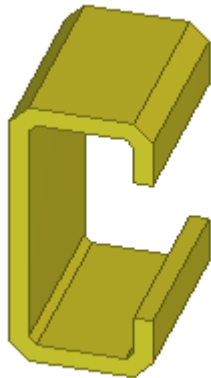
Create parametric profiles with variable cross sections

You can create parametric user-defined profiles with variable cross sections using the **Profile Editor**. You can use a profile with variable cross sections like any other parametric profile.

You can

- use a cross section with different dimensions at different locations in a profile
- modify the variables of the cross sections and the profile
- save the profile and use it as a parametric profile through the profile catalog
- import and export variable cross section profiles
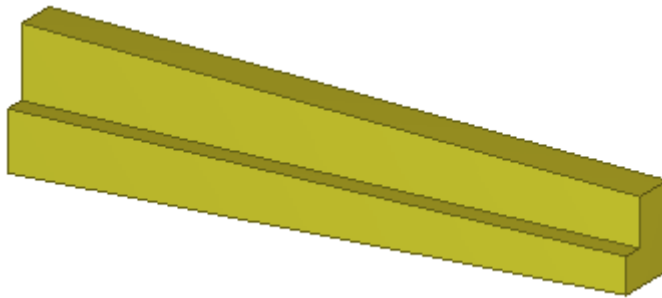
NOTE When you use this method, only the dimensions of a variable cross section can vary, not the actual shape of the cross section. If you want to use several different cross section shapes in the profile, create a fixed profile (page 161) with multiple cross sections instead.

Create a profile with variable cross sections

Before you start:

- Create a sketched profile (page 173) using the sketch editor.

- In the **Variables** dialog box in the sketch editor, set **Visibility** to **Show** for the dimensions that you want to change when using the profile in a model.

1. On the **File menu**, click **Catalogs** --> **Define properties** --> **Define profile with variable cross section**.

   The **Define Profile with Variable Cross Section** dialog box opens.

2. Select the sketch you want to use as the start and end cross section of the profile.

3. Click **OK**.

   The **Profile Editor** and the **Profile preview** view appear.
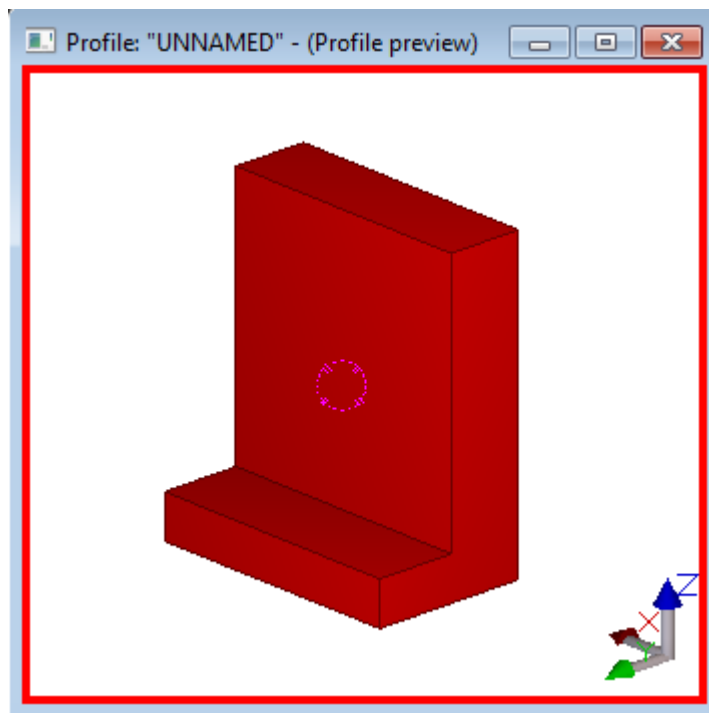
4. Under **Cross sections of the profile**, add cross sections or remove selected cross sections by clicking **Add** or **Remove**.

   When you click **Add**, Tekla Structures adds a new cross section at the end of the profile, at the location 1.0., and moves the existing cross sections towards the start of the profile. By default, cross sections are located at 0.1 intervals in the profile.

5. Under **Cross section variables**, define the following:

   - The relative location of each cross section in the profile.

     Use the `*.Location` variables. For example, start=0.00, middle=0.5, end=1.00.

   - How the cross sections are aligned in the horizontal and vertical direction.

     Use the `*.HorPos` and `*.VerPos` variables.

- How much the cross sections are offset from the alignment.

  Use the `*.HorOffset` and `*.VerOffset` variables.
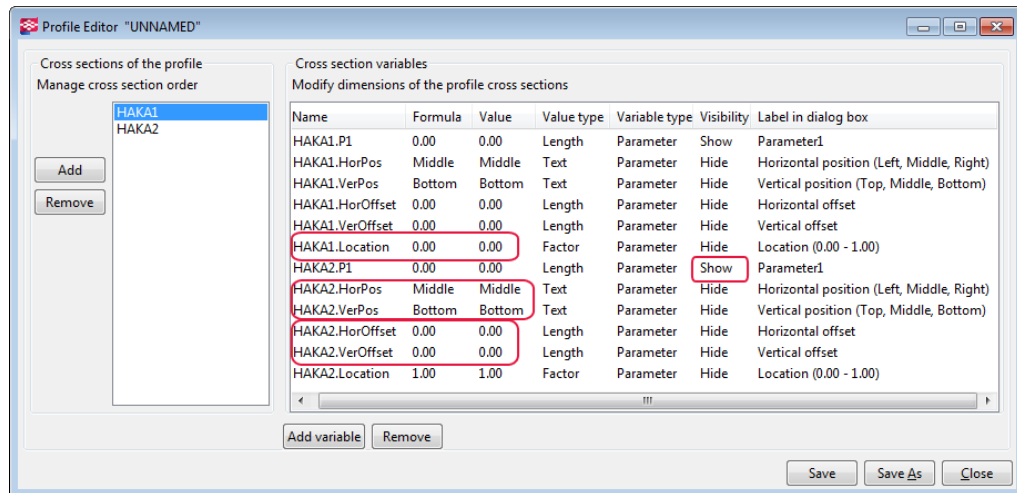
6. If you have added new cross sections, check that they do not overlap any existing cross sections.

7. Set **Visibility** to **Show** for the dimensions that you want to change when using the profile in a model.

8. If you want to use parameter variables and equations to define the cross section dimension, click **Add variable** and define the variable values.

9. Save the profile.

   a. Click **Save**.

   b. In the **Save profile as** dialog box, enter a unique name for the profile.

      You cannot include numbers in the profile name, or use the name of a standard profile.

   c. Click **OK**.

      Tekla Structures saves the profile in the current model folder.

Modify a profile with variable cross sections

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

2. Open the **Others** branch at the end of the profile tree.

3. Right-click a profile with variable cross sections, and then select **Edit profile** to open the profile in the **Profile Editor**.

4. Modify the profile properties.

5. Click **Save**.

Define standardized values for parametric profiles

You can define standardized values for the dimensions of parametric profiles. The standardized values are visible in the profile catalog where you can select suitable dimension values for the profiles.

1. Under `..\ProgramData\Trimble\Tekla Structures\<version> \environments\<environment>` folder, locate the `industry_standard_profiles.inp` file. The exact file location may vary depending on the folder structure of your environment files.

2. Open the `industry_standard_profiles.inp` file using any standard text editor, for example, Microsoft Notepad.

3. Modify the file.

    The file has the following format:

    - profile and profile subtype

    - parameters separated by spaces

    - units for each parameter

    - standardized values for each parameter.

        Each dimension combination has its own row.

4. Save the file.

Example

For example, the standardized combinations of dimension values for a C profile are as follows:

```
C h*b*t
h       b       t
mm      mm      mm
75      35      5
75      35      6
75      35      7
100     40      7
100     40      8
100     40      9
```

Create an image of a profile

To illustrate the shape and dimensions of a profile you have created, you can create an image of it. Tekla Structures displays the image when you browse for profiles in the profile catalog. The image must be in Windows bitmap (`.bmp`) format and can be created with any bitmap editor, for example Microsoft Paint.

1. Take a screenshot of the profile you have drawn or sketched.

   For example, press the **Print Screen** (**Prt Scr**) key to take a screenshot of your entire desktop. To take a screenshot of an active window, press **Alt +Print Screen**. The screenshot is placed on the clipboard.

2. Open the screenshot in any bitmap editor (for example, Microsoft Paint) and modify the image if necessary.

3. Save the image in `.bmp` format in the `..\ProgramData\Trimble\Tekla Structures\<version>\Bitmaps` folder.

   The file name must match the actual profile name. For example, if the profile name is `mysketch`, the image must be named `mysketch.bmp`.

4. Restart Tekla Structures.

   The image is now shown in the profile catalog.
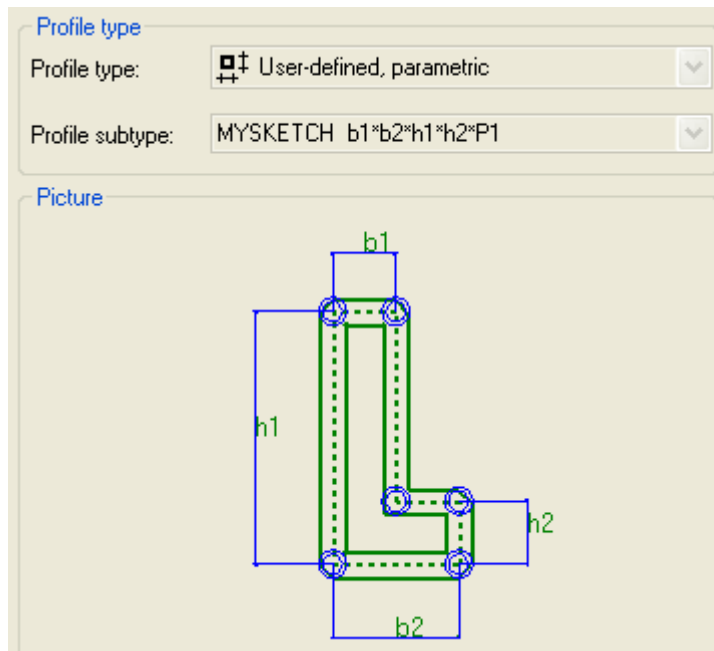
4.10 Customize the shape catalog

The **Shape Catalog** dialog box contains information on shapes. It is used for viewing shape properties, and for importing and exporting shapes.

The catalog includes default shapes, for example **Default** and **Concrete_Default**. The shapes you download from Tekla Warehouse or create

using existing geometry (page 204) in the currently open model are also displayed in the **Shape Catalog** dialog box.

Shapes are used in defining items. In Tekla Structures, items are similar to other parts, such as beams and columns. The main difference between items and other types of parts is that a 3D shape defines the geometry of an item, whereas a part has a 2D profile that is extruded to create the length of the part.

The shapes listed in the shape catalog are stored in the current model folder. There are two files for each shape: one `.xml` file stored in the `\Shapes` folder and one `.tez` or `.xml` file in the `\ShapeGeometries` folder.

The shapes that are used for items in a model are automatically copied to the model folder.

If you have shapes that you would like to have available in the **Shape Catalog** dialog box for all new models that are created in your project or company, copy the corresponding `.tez` and `.xml` files to the correct subfolders (`\Shapes` and `\ShapeGeometries`) in the `\profil` folder under your project or firm folder.

NOTE If your project, company, or environment uses a common location for shapes that are used in several Tekla Structures versions including 2017i and older, use `.xml` format for shape geometry files. The compressed `.tez` files do not work in Tekla Structures 2017i or older versions.

See also

Import a shape (page 203)

Create a shape (page 204)

Compress shape geometry files (page 206)

Clean shape geometry files (page 207)

Export a shape (page 208)

Delete a shape (page 208)

Import a shape

You can import the following types of shape files: `dgn`, `tsc`, `skp`, `dxf`, `dwg`, `ifc`, `ifcZIP`, `ifcXML`, `igs`, `iges`, `stp`, and `step`.

When using other modeling software to model shapes that you want to import into Tekla Structures, we recommend that you center parts around the origin and direct the parts along the x axis.

1. On the **File** menu, click **Catalogs** --> **Shape catalog**.

   The **Shape Catalog** dialog box opens.

2. Click **Import**.

3. Select the shape file to import.

   To select multiple shape files, hold down **Ctrl** or **Shift**.

4. Click **OK**.

   Importing a large file can take several minutes.

Shape import has three possible results:

- Tekla Structures imports the shape as a watertight solid shape. All solid operations are available.

- Tekla Structures imports the shape as a non-solid shape. A non-solid shape means that the object may not be watertight. For example, it has holes, or is missing a face or an edge.

- Import fails. This can happen, for example, if the shape is very complex or has no volume. There may also be a tolerance difference between Tekla Structures and the original software that was used to create the shape. To find out why the import failed, check the session history log by clicking **File menu** --> **Logs** --> **Session history log** .

When you import a shape into the **Shape Catalog**, Tekla Structures creates two files: one `.xml` file for shape attributes, such as name and GUID, and one `.tez` file for geometric properties, such as coordinates. The files are saved in the current model folder under the `\Shapes` and `\ShapeGeometries` subfolders.

The shape name that is shown in the **Shape Catalog** dialog box is determined as follows:

- If you import a `.tsc` file, the shape name is read from the imported file.

- If you import other file types, the shape name is the name of the imported file.

TIP You can also download shapes from Tekla Warehouse, or create shapes using existing geometry (page 204) in Tekla Structures models.

See also

Create a shape

In addition to importing item shapes or downloading them from Tekla Warehouse, you can create shapes using existing geometry and parts in Tekla Structures models. For example, you can create a shape using a single part or several parts that have been attached to each other.

The part reference point that has the yellow handle determines the origin of the shape. The positive global x direction determines the direction of the shape. Later on when you create items using the shape, the shape origin and direction will align with the yellow and magenta item handles.

Create a shape by using existing geometry in the model

Use this method if you want to create a new shape using an existing part, but you do not want to delete the part or change it to an item.

1. Using parts, model the geometry from which you want to create a shape.

2. If you want to include more than one part in the shape, attach the parts to each other.

3. Select the part.

4. Right-click and select **Create shape from geometry**.

   Alternatively, you can go to **Quick Launch**, search for and select the **Create shape from geometry** command, and then select the part.

Tekla Structures adds a new shape to the shape catalog (page 202) using the part name as the shape name.

You can then use the shape when you create items in the model. You can also modify items and shapes further in the **Geometry editing** mode.

Create a shape by converting a part to an item

When you change an existing part in the model to an item, Tekla Structures also creates a new shape and adds it to the shape catalog.

When you change a part to an item, Tekla Structures deletes the original part and replaces it with the newly created item in the model. The name, material, finish, class, pour phase, and the numbering properties of the original part are saved as the corresponding item properties. Other part type specific properties and user-defined attributes are not saved. The objects that are attached to the original part, such as reinforcement and surfaces, are deleted.

Curved beams, spiral beams, bent plates, lofted plates, and lofted slabs cannot be changed to items.

1. Create the parts that you want to change to an item.

2. If you want to include more than one part in the item, attach the parts to each other.

3. Select the part.

4. Right-click and select **Convert part to item**.

   Alternatively, you can go to **Quick Launch**, search for and select the **Convert part to item** command, and then select the part.

Tekla Structures changes the part to an item and adds a new shape to the shape catalog (page 202). The shape name is generated using the part name and part location in the format <grid location>_<elevation>_<part name>. For example:

- 1/D_+0_FOOTING

- 3/C_+0-+3600_COLUMN

- 1-2/A-B_+3600_SLAB

If there is already a shape with the same name in the shape catalog, Tekla Structures adds two underscore characters and a running number at the end of the new shape name. For example, 1/D_+0_FOOTING__1.

Compress shape geometry files

You can compress shape geometry files by converting the files from `.xml` format to compressed format `.tez`. Using the `.tez` format saves disk space.

In Tekla Model Sharing models, the shape geometry files are automatically converted from `.xml` to `.tez` when you use Tekla Structures 2018 or a newer version.

In older versions and in models that are not shared, you can manually compress the shape geometry files that are stored in the `\ShapeGeometries` subfolder in the current model folder. The files in the `\Shapes` subfolder will not be compressed.

If you have already used any of the shapes for items in the model, they will work the same way even after compression.

NOTE Compression is a permanent action, and you cannot undo it even if you do not save the model.

Do not compress shape geometry files if you need them in models that you will open using Tekla Structures 2017i or an older version. The `.tez` files do not work in those versions.

If your project, company, or environment uses a common location for shapes that are used in several Tekla Structures versions including 2017i and older, do not convert those shape geometry files to `.tez` format. Otherwise the shapes will not work in all versions.

How to compress shape geometry files

To compress existing shape geometry files, either re-import the original shape files (page 203), or use the **Compress shape geometries** application as follows:

1. Open the model whose shape geometry files you want to compress.

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

3. Search for the **Compress shape geometries** application, and then double-click to open it.

4. In the **Compress shape XML files to TEZ format** dialog box, click **Compress**.

5. Re-open the model.

Clean shape geometry files

If some previously imported shapes cause missing faces or edges in items or drawings, you can clean the shape geometry files. Cleaning means that Tekla Structures investigates and corrects the shape geometry and tries to create solid objects. This is useful with shapes that have been imported to Tekla Structures models prior to version 2018i.

The **Shape cleaner** application provides an option to create backups of the original shape geometry files and to revert to them, if needed.

How to clean shape geometry files

To clean existing shape geometry files, either re-import the original shape files (page 203), or use the **Shape cleaner** application as follows:

1. Open the model whose shape geometry files you want to clean.

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

3. Search for the **Shape cleaner** application, and then double-click to open it.

   The **Shape cleaner** dialog box opens.

4. Select the shapes that you want to clean.

5. If you want to create backups of the shape geometry files, select the **Create backups from shapes before cleaning** check box.

6. Click **Clean**.

Tekla Structures cleans the shapes and shows how many shapes resulted in being solid objects and how many non-solid.

If you need to interrupt the cleaning process, you can click **Stop**.

7. Re-open the model to see the changed shape geometry in the items in the model.

8. If you are not happy with the result, and if you have created the backup files, you can go back to the original shape geometry files.

   a. Open the **Shape cleaner** dialog box again.

   b. Select the shapes that you want to restore.

   c. Click **Revert**.

Export a shape

1. On the **File** menu, click **Catalogs** --> **Shape catalog** .

   The **Shape Catalog** dialog box opens.

2. Select the shape to export.

   To select multiple shapes, hold down **Ctrl** or **Shift**.

3. Click **Export**.

4. If you are exporting only one shape, select the folder where you want to export the shape, and enter a name for the export file in the **Selection** box.

5. If you are exporting multiple shapes, select the folder where you want to export the shapes.

   Tekla Structures will create a separate export file for each shape using the shape name as the file name.

6. Click **OK**.

The shapes are saved in the destination folder as `.tsc` files.

TIP   You can also upload shapes to Tekla Warehouse.

See also

Import a shape (page 203)

Delete a shape (page 208)

Customize the shape catalog (page 202)

Delete a shape

Before you start, ensure that the shape you want to delete is not used in your Tekla Structures model. When you delete a shape from the **Shape Catalog**, the shape is no longer available anywhere in the model. If a model includes a deleted shape, it is only shown as a straight line between its original reference points.

1. On the **File** menu, click **Catalogs** --> **Shape catalog** .

   The **Shape Catalog** dialog box opens.

2. Right-click the name of the shape.

3. Click **Delete**.

Tekla Structures deletes the shape.

See also

Example: Import a shape from SketchUp Pro

In this example, you import a solid 3D shape from Trimble SketchUp Pro to a Tekla Structures model.

1. Create an empty model in SketchUp Pro.

   Delete any extra entities, such as the default person on the drawing area.

2. Create a group of entities.

   Although Tekla Structures supports importing separate individual entities, we recommend you create a group of entities or a component in SketchUp.

   All SketchUp groups and components should form watertight solids. Select the group or component and open **Entity Info** to check that the selection is a solid. SketchUp solids have a volume. If there is no volume listed, the selection is not a solid.

3. Select the group and click **Solid Tools** --> **Union** to make the group of entities into a union of solids.

   Your group becomes a single solid volume: a solid.

4. Place the solid in SketchUp so that it lies along the positive x axis (red), and halfway on both y (green) and z axes (blue). In Tekla Structures, the yellow and magenta part handles will align with the x axis used in SketchUp.

The location and rotation of the solid in SketchUp are important, since they determine how an item is inserted and positioned in Tekla Structures. Different positioning in SketchUp causes an offset in Tekla Structures.
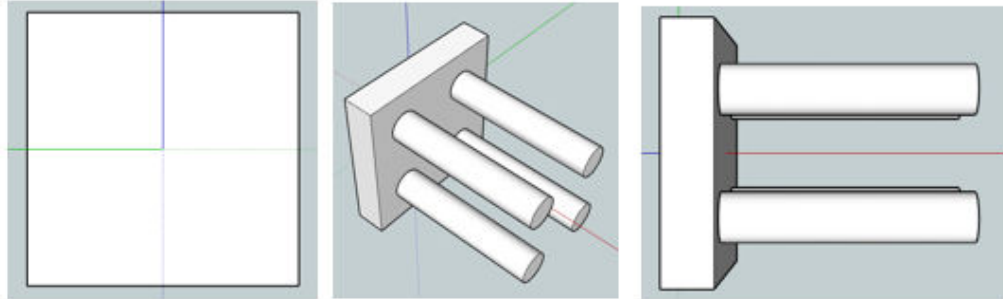
5. Save the SketchUp file.
6. In your Tekla Structures model, open the **Shape Catalog** and click **Import**.
7. Select the SketchUp file.
8. Click **OK**.

Tekla Structures imports the shape to the **Shape Catalog** and you can use it to define the shape of an item or a concrete item.

See also

Customize the shape catalog (page 202)

Import a shape (page 203)

4.11 Customize the bolt catalog

The individual *bolt assembly elements*, such as bolts of different sizes and lengths, nuts and washers, are listed in the bolt catalog. Each *bolt assembly* then consists of these bolt assembly elements. You cannot use a bolt if it does not belong to a bolt assembly. The bolt assemblies are listed in the bolt assembly catalog.

Tekla Structures stores the bolt catalog information in the `screwdb.db` file and the bolt assembly catalog information in the `assdb.db` file.

See also

How the bolt catalog and bolt assembly catalogs work together (page 211)

Manage bolts and bolt assemblies (page 211)

Import and export bolts and bolt assemblies (page 216)

Bolt length calculation (page 221)

How the bolt catalog and bolt assembly catalogs work together
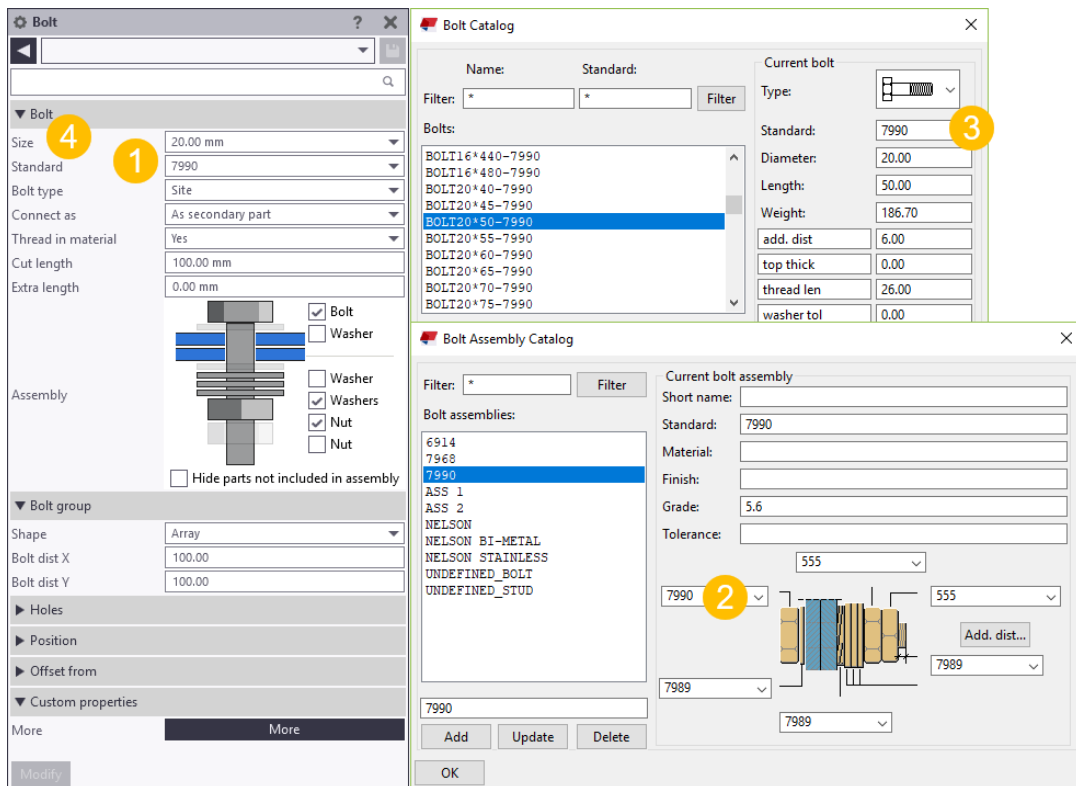
(1) The **Bolt standard** options are read from the bolt assembly catalog.

(2) The bolt assembly catalog defines which bolt standard is used in the bolt assembly.

(3) The bolt catalog contains the different bolt diameters, lengths, and other properties used in the bolt standard.

(4) The **Bolt size** options are read from the bolt catalog depending on the selected **Bolt standard** option.

See also

Manage bolts and bolt assemblies

This section describes how to manage bolts and bolt assemblies using the bolt catalog and the bolt assembly catalog. You can add, modify, and delete bolts and bolt assemblies.

Click the links below to find out more:

Add a bolt to the catalog

You need to add individual bolt elements, such as bolts, nuts, and washers, to the bolt catalog before you can define bolt assemblies and use them in a model.

The following steps are for adding bolts, but they also apply to adding nuts and washers.

1. On the **File** menu, click **Catalogs** --> **Bolt catalog** to open the **Bolt Catalog** dialog box.

2. Enter the name of the bolt in the following box:

   You can enter a maximum of 40 characters in the name box.

3. In the **Type** list, select an option to define the bolt element type.

4. Define the other properties of the new bolt.

   You can enter a maximum of 25 characters in the **Standard** box.

   Use different names for bolt, nut, washer, and stud standards to distinguish bolt element types from each other when defining bolt assemblies.

5. Click **Add** to add the bolt to the bolt catalog.

   You cannot use a bolt if it does not belong to a bolt assembly. Therefore, we recommend checking that the catalog also includes nuts and washers that work with the new bolt so that you can create a bolt assembly. If the

catalog does not include suitable nuts and washers, add them the same way as you added the new bolt.

6.	Click **OK**.

	The **Save confirmation** dialog box appears.

7.	Select **Save changes to model folder** to save the changes in the `screwdb.db` file in the current model folder, and then click **OK**.

TIP	You can also add bolts by importing them to the bolt catalog.

See also

Add a stud bolt to the catalog

A stud is special type of bolt that is welded to steel parts to transfer loads between steel and concrete. You cannot use studs unless you have defined a stud assembly that contains the assembly's name and material.

1.	On the **File** menu, click **Catalogs** --> **Bolt catalog** to open the **Bolt Catalog** dialog box.

2.	Enter values for the following properties:

	•	**Name**: Name for the stud bolt.
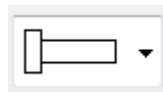
	•	**Type**:

	•	**Standard**: This name is needed when creating a bolt assembly for the stud.

	•	**Diameter**: Shank diameter.

	•	**Length**: Stud length.

	•	**Weight**: Stud weight.

	•	**top thick**: Head thickness.

- **top diameter**: Head diameter.

The units depend on the settings in **File menu** --> **Settings** --> **Options** --> **Units and decimals** .

3. On the **File** menu, click **Catalogs** --> **Bolt assembly catalog** to open the **Bolt Assembly Catalog** dialog box.

4. Select the standard for the stud bolt.

5. Set all the other bolt assembly elements to **None**.
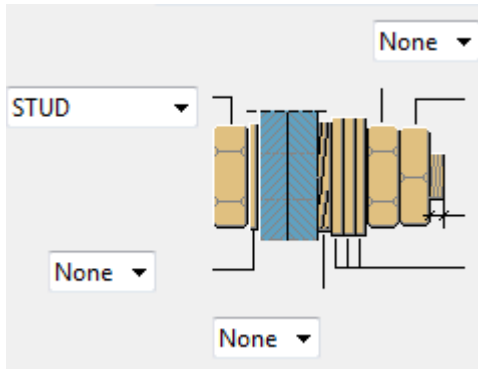
6. To create studs in the model, create bolts and select the stud assembly standard.

See also

Bolt catalog properties (page 224)

Modify bolt information in the catalog

1. On the **File** menu, click **Catalogs** --> **Bolt catalog** to open the **Bolt Catalog** dialog box.

2. Select a bolt from the list.

3. Modify the properties.

4. Click **Update**.

5. Click **OK**.

The **Save confirmation** dialog box appears.

6. Select **Save changes to model folder** to save the changes in the `screwdb.db` file in the current model folder, and then click **OK**.

See also

Add a bolt to the catalog (page 212)

Delete a bolt from the catalog (page 215)

Bolt catalog properties (page 224)

Delete a bolt from the catalog

1. On the **File** menu, click **Catalogs** --> **Bolt catalog** to open the **Bolt Catalog** dialog box.

2. Select a bolt from the list.

   Use the **Shift** and **Ctrl** keys to select multiple bolts.

3. Click **Delete**.

4. Click **OK**.

   The **Save confirmation** dialog box appears.

5. Select **Save changes to model folder** to save the changes in the `screwdb.db` file in the current model folder, and then click **OK**.

See also

Add a bolt assembly to the catalog

You can add new bolt assemblies to the bolt assembly catalog. Note that the bolt assembly can contain only bolts or studs, not both of them.

1. On the **File** menu, click **Catalogs** --> **Bolt assembly catalog** to open the **Bolt Assembly Catalog** dialog box.

2. Enter the name of the bolt assembly in the following box:

3. Define the other properties of the new bolt assembly.

   You can enter a maximum of 30 characters in the **Standard** box. For all the other properties, you can enter a maximum of 25 characters.

4. Click **Add** to add the bolt assembly to the catalog.

5. Click **OK**.

   The **Save confirmation** dialog box appears.

6. Select **Save changes to model folder** to save the changes in the `assdb.db` file in the current model folder, and then click **OK**.

See also

Modify bolt assembly information in the catalog

1. On the **File** menu, click **Catalogs** --> **Bolt assembly catalog** to open the **Bolt Assembly Catalog** dialog box.

2. Select a bolt assembly from the list.

3. Modify the properties (page 226).

4. Click **Update**.

5. Click **OK**.

   The **Save confirmation** dialog box appears.

6. Select **Save changes to model folder** to save the changes in the `assdb.db` file in the current model folder, and then click **OK**.

See also

Delete a bolt assembly from the catalog

1. On the **File** menu, click **Catalogs** --> **Bolt assembly catalog** to open the **Bolt Assembly Catalog** dialog box.

2. Select a bolt assembly from the list.

3. Click **Delete**.

4. Click **OK**.

   The **Save confirmation** dialog box appears.

5. Select **Save changes to model folder** to save the changes in the `assdb.db` file in the current model folder, and then click **OK**.

See also

Import and export bolts and bolt assemblies

Use importing and exporting for merging bolts and bolt assemblies across catalogs. Bolts are imported and exported as `.bolts` files, bolt assemblies as `.bass` files, and bolt catalogs as `.lis` files.

When you export single bolts or bolt assemblies, you can select the bolts or bolt assemblies you want to include in the `.bolts` or `.bass` file. When you import and export bolt assemblies, also the related bolts are included in the `.bass` file.

You can import and export an entire bolt catalog. You can also import a part of an exported bolt catalog.

Importing and exporting bolt catalogs is useful, when you:

- Upgrade to newer version of Tekla Structures and you want to use a customized bolt catalog from a previous version.
- Want to combine bolt catalogs that are stored in different locations.
- Want to share bolt catalog information with other users.

TIP You can also download or share bolt assemblies using Tekla Warehouse.

See also

Import bolts to the catalog

Bolts are imported and exported as `.bolts` files. A `.bolts` file can include one bolt or several bolts.

1. On the **File** menu, click **Catalogs** --> **Bolt catalog** to open the **Bolt Catalog** dialog box.
2. Right-click in the **Bolts** list and select **Import**.
3. Select the import file.
4. Click **OK**.

   The bolts are displayed on the **Bolts** list by their original names.

5. Click **OK**.

   The **Save confirmation** dialog box appears.

6. Select **Save changes to model folder** to save the changes in the `screwdb.db` file in the current model folder, and then click **OK**.

See also

Export bolts from the catalog

Bolts are imported and exported as `.bolts` files. A `.bolts` file can include one bolt or several bolts.

1. On the **File** menu, click **Catalogs** --> **Bolt catalog** to open the **Bolt Catalog** dialog box.

2. Select bolts from the **Bolts** list.

   Use the **Shift** and **Ctrl** keys to select multiple bolts.

3. Right-click in the **Bolts** list and select **Export**.

4. Browse for the folder where you want to save the export file.

5. Enter a name for the file in the **Selection** box.

6. Click **OK**.

See also

Import bolt assemblies to the catalog

Bolt assemblies are imported and exported as `.bass` files. A `.bass` file can include one bolt assembly or several bolt assemblies.

1. On the **File** menu, click **Catalogs** --> **Bolt assembly catalog** to open the **Bolt Assembly Catalog** dialog box.

2. Right-click in the **Bolt assemblies** list and select **Import**.

3. Select the import file.

4. Click **OK**.

   The bolt assemblies are displayed on the **Bolt assemblies** list by their original names.

5. Click **OK**.

   The **Save confirmation** dialog box appears.

6. Select **Save changes to model folder** to save the changes in the `assdb.db` file in the current model folder, and then click **OK**.

See also

Add a bolt assembly to the catalog (page 215)

Import a bolt catalog (page 219)

Import bolts to the catalog (page 217)

Export bolt assemblies from the catalog (page 219)

Export bolt assemblies from the catalog

Bolt assemblies are imported and exported as `.bass` files. A `.bass` file can include one bolt assembly or several bolt assemblies.

1. On the **File** menu, click **Catalogs** --> **Bolt assembly catalog** to open the **Bolt Assembly Catalog** dialog box.

2. Select bolt assemblies from the **Bolt assemblies** list.

   Use the **Shift** and **Ctrl** keys to select multiple bolt assemblies.

3. Right-click in the **Bolt assemblies** list and select **Export**.

4. Browse for the folder where you want to save the export file.

5. Enter a name for the file in the **Selection** box.

6. Click **OK**.

See also

Export an entire bolt catalog (page 221)

Export bolts from the catalog (page 218)

Import bolt assemblies to the catalog (page 218)

Import a bolt catalog

Bolt catalogs are imported to Tekla Structures models as `.lis` files.

1. Open the model to which you want to import a bolt catalog.

2. Copy the `screwdb.lis` file that you want to import to the current model folder.

3. To import the bolt catalog file `screwdb.lis` from the current model folder, go to **Quick Launch**, start typing `import bolt catalog`, and select the **Import Bolt Catalog** command from the list that appears.

   Tekla Structures does not replace the entries that have the same names as the entries in the import file.

4. Check the status bar for error messages.

   To view errors, go to the **File** menu and click **Logs** --> **Session history log** .

See also

Import a part of the bolt catalog
If you do not want to import the entire bolt catalog, you can select the parts to be imported.

TIP If you only want to import a few bolts or bolt assemblies, use the import and export commands of the corresponding catalogs.

---

1. Open the model that contains the bolt catalog you want to use.

2. Go to **Quick Launch**, start typing `export bolt catalog`, and select the **Export Bolt Catalog** command from the list that appears.

   The bolt catalog is saved as the `screwdb.lis` file in the current model folder.

3. Open the `screwdb.lis` file using a text editor, for example, Microsoft Notepad.

   Each entry is listed on a separate row.

4. Delete the unwanted rows from the file.

   WARNING   Do not delete the `STARTLIST` and `ENDLIST` rows.

   ---

5. Save the file with the name `screwdb.lis`.

6. Open the model to which you want to import the bolt catalog.

7. Copy the `screwdb.lis` file that you want to import to the current model folder.

8. To import the bolt catalog file `screwdb.lis` from the current model folder, go to **Quick Launch**, start typing `import bolt catalog`, and select the **Import Bolt Catalog** command from the list that appears.

See also

Export an entire bolt catalog

Bolt catalogs are exported from Tekla Structures models as `.lis` files.

1. Open the model that contains the bolt catalog you want to export.

2. Go to **Quick Launch**, start typing `export bolt catalog`, and select the **Export Bolt Catalog** command from the list that appears.

    The exported bolt catalog is the `screwdb.lis` file in the current model folder.

    TIP The **Export Bolt Catalog** command exports the entire bolt catalog. To export only part of the bolt catalog, modify the export file to contain only the required elements. You can also export bolts from the **Bolt Catalog** dialog box or bolt assemblies from the **Bolt Assembly Catalog** dialog box.

See also
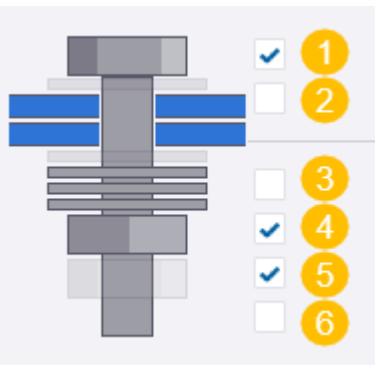
Bolt length calculation

Tekla Structures uses values from the bolt catalog and the bolt assembly catalog when calculating the bolt length. If the bolt catalog does not contain long enough bolts for your purposes, you need to add them to the bolt catalog.

The following **Assembly** settings in the **Bolt** properties affect the bolt length calculation process. If the check box is selected, the bolt element is used in the bolt assembly.

Bolt assembly	Bolt elements
	1: If the check box is clear, only a hole is created **2:** Washer (1) **3:** Washer (2) **4:** Washers (3) **5:** Nut (1) **6:** Nut (2)

The chart and the detailed steps below explain the process of bolt length calculation.
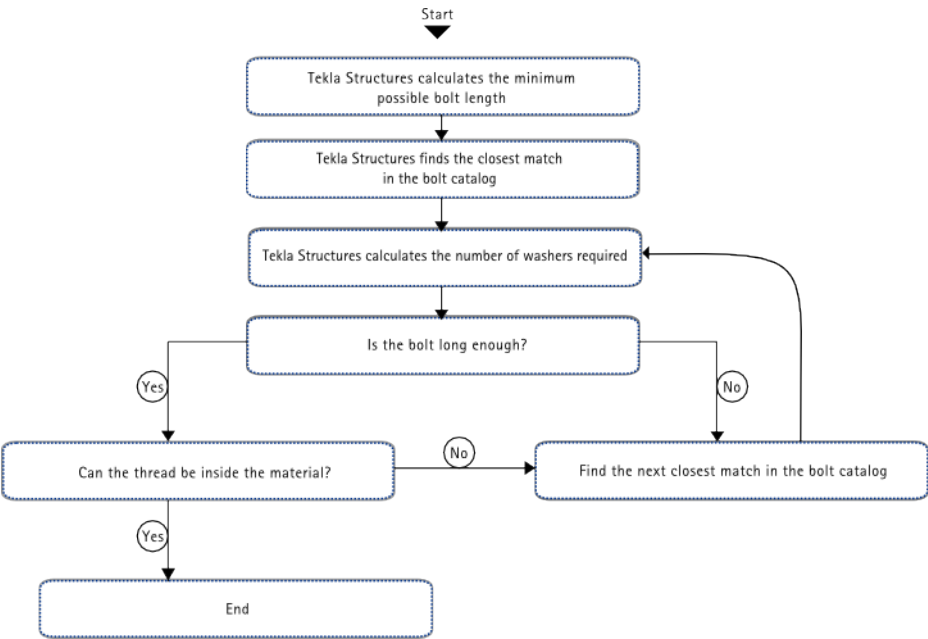
1. Tekla Structures calculates the **minimum possible length** of the bolt as follows:

   washer (1) thickness (if the check box is selected) +

   material thickness +

   washer (2) thickness (if the check box is selected) +

   washer (3) thickness (if the check box is selected) +

   nut (1) thickness +

nut (2) thickness +

extra length

2. Tekla Structures searches for the **closest match** in the bolt catalog.

3. Tekla Structures calculates the **number of washers required** (must not exceed 10) so that the **length of the shaft is less than**:

nut (1) thickness +

material thickness +

nut (2) thickness +

washer (1) thickness +

washer (2) thickness +

(number of washers*washer (3) thickness)

4. Tekla Structures checks that the **bolt found in step 2 is longer than**:

extra length +

nut (1) thickness +

material thickness +

nut (2) thickness +

add. dist (from the bolt catalog) +

washer (1) thickness +

washer (2) thickness +

(number of fitting washers * washer (3) thickness)

5. If the selected bolt does not fulfill the criteria in step 4, Tekla Structures returns to step 2, otherwise it continues on to step 6.

6. Tekla Structures checks that the selected bolt fulfills **all the following conditions**:

   • Can the thread be inside the material to be connected? Even if this is **not** allowed, the calculation always allows 3 or 4 mm of thread to be inside the material, depending on the bolt diameter. If the bolt diameter is ≥ 24 mm, it allows 4 mm, otherwise it allows 3 mm.

   • Shaft length must be more than:

   material thickness +

   extra length +

   washer (1) thickness (if checked) -

   maximum thread in material allowed (if thread in material = no) = 3 mm or 4 mm

   • Shaft length is calculated as:

   Screw length - screw thread length - thread end.

- Thread end is the part of the bolt between the shaft and the thread. It is calculated as follows:

Diameter of bolt (mm)	Thread end (mm)
>33.0	10.0
>27.0	8.0
>22.0	7.0
>16.0	6.0
>12.0	5.0
>7.0	4.0
>4.0	2.5
≤4	1.5

7. If the selected bolt does not fulfill **all** the above conditions, Tekla Structures returns to step 2 and tries the next longest bolt.

8. If the advanced option `XS_BOLT_LENGTH_EPSILON` is set, the epsilon thickness is added to, or subtracted from, the material thickness to avoid inaccurate bolt length calculation.

   For example, if this value is not taken into account, and the calculated length is 38.001 mm, a 39 mm bolt might be selected.
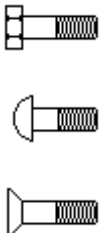
See also

How the bolt catalog and bolt assembly catalogs work together (page 211)

Add a bolt to the catalog (page 212)

Bolt catalog properties

Use the **Bolt Catalog** dialog box to view and modify the properties of individual bolt elements, such as bolts, washers, and nuts. The units depend on the settings in **File menu** --> **Settings** --> **Options** --> **Units and decimals** .

Option	Description
Type	The type of the bolt element. The options are:

Option	Description
	⬡◻ (Nut) ◎▯ (Washer) ▭━ (Stud)
Standard	The name of the bolt element standard. Used in the **Bolt Assembly Catalog** dialog box for defining bolt elements in a bolt assembly. Use different names for bolt, nut, washer, and stud standards to distinguish bolt element types from each other.
Diameter	The diameter of the bolt element.
Length	The length of the bolt element.
Weight	The weight of the bolt element.
add. dist	The length of the part of the bolt that protrudes from the nut. The value is used in bolt length calculation.
top thick	The thickness of the bolt head.
thread len	The length of the threaded part of the bolt shaft. The value is not used in bolt length calculation (value is 0) if the bolt is fully-threaded.
washer tol	The tolerance between the washer inner diameter and the bolt diameter. The value is used when searching for the correct-sized washer for the bolt. Not used in bolt length calculation.
span size	The size of the wrench needed.
calc thick	The calculation thickness of a nut or a washer. This value is used in bolt length calculation.
real thick	The true thickness of a nut or a washer. This is for information only.
inner diam	The inner diameter of a nut or a washer. This is for information only.
outer diam	The outer diameter of a nut or a washer. This is for information only.

Option	Description
top diam	The diameter of the hexagon. This is for information only.

See also

Bolt assembly catalog properties

Use the **Bolt Assembly Catalog** dialog box to view and modify the properties of bolt assemblies. The units depend on the settings in **File menu** --> **Settings** --> **Options** --> **Units and decimals** .

Option	Description
Short name	This name is used in drawings and reports. It is usually the commercial name for a specific bolt.
Standard	This name is the full name which is shown in the bolt assemblies list in the **Bolt Assembly Catalog** dialog box, and in the **Bolt standard** list in the **Bolt Properties** dialog box. The value is used in bolt length calculation.
Material	The material of the bolt assembly.
Finish	The type of the finish.
Grade	The grade of the bolt assembly.
Tolerance	The tolerances of the bolt assembly. This is for information only. The values cannot be reported, for example.

Additional length for bolt calculation

Option	Description
Add. dist...	The **Additional Distance** option controls how much of the bolt protrudes from the nut. **Additional Distance** updates the **Additional Distance** values of all bolts that use the selected bolt standard and have the selected diameter. The value is used in bolt length calculation.
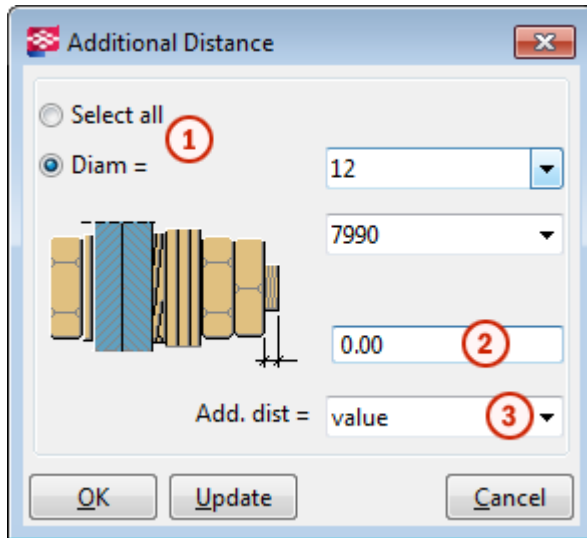
(1) Select whether the value of the additional length affects all or individual diameters of one bolt assembly.

(2) Enter the additional length value.

(3) Select whether the value is absolute or relative to the diameter.

See also

Add a bolt assembly to the catalog (page 215)

4.12 Customize the rebar catalog

The rebar catalog contains definitions for different reinforcement types, such as reinforcing bars and strands of different grades.

The rebar catalog shows standard, environment-specific reinforcing bars and strands of the environment (or environments) that you have installed and that is currently open. The blank project environment only contains undefined reinforcing bars and strands.

You can add, copy, group, modify, and delete rebar definitions. You can also import and export single definitions, groups of definitions, or entire rebar catalogs.

Tekla Structures stores the rebar catalog information in the `rebar_database.inp` file that is by default saved to the current model folder.

Reinforcement meshes are not included in the rebar catalog. Standard meshes are defined in their own catalog file (page 296), `mesh_database.inp`.

Work with definitions in the rebar catalog

You can add, copy, modify, and delete rebar definitions in the rebar catalog.

To use the newly added or modified rebar definitions in the model, reopen the model.

Add a new rebar definition

You can add new definitions to the rebar catalog by defining the bar properties from scratch.

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

2. Click **New bar**.

3. In the **New bar** dialog box, enter the bar properties.

   If a property is shown in red, it is missing a value or has a value that is not valid. For example, **Grade** and **Size** must have a value.

4. Click **Add**.

5. Click **Save** to save the changes to the rebar catalog.

Add a new rebar definition by copying

You can add new definitions to the rebar catalog by copying an existing definition and then modifying it.

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

2. Browse for and select the definition that you want to copy.

3. Click **Copy**.

   Alternatively, you can right-click and select **Copy**.

4. In the **Copy** dialog box, enter or modify the bar properties.

   Modify the property values that are shown in red so that the new definition is not a duplicate of the original definition.

5. Click **Add**.

6. Click **Save** to save the changes to the rebar catalog.

Select rebar definitions

You can use the following methods when you select rebar definitions in the **Rebar catalog** dialog box.

Selecting different sets of definitions is useful when you want to export (page 232) or add tags (page 236) to certain definitions, or otherwise modify a sub-set of definitions.

- Use the following commands on the catalog ribbon:
    - Click **Select all** to select all the definitions in the currently visible group.

      Alternatively, you can select one definition and then press **Ctrl+A**.
    - Click **Select none** to clear the current selection.
    - Click **Invert selection** to select the currently unselected definitions and to deselect the currently selected definitions.
- To select several consecutive definitions, select the first definition, then hold down **Shift** and select the last definition.
- To select several non-consecutive definitions, select the first definition, then hold down **Ctrl** and select the other definitions.

Modify a rebar definition

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

2. Browse for and select the definition that you want to modify.

   To modify several definitions, hold down **Ctrl** or **Shift** when you select (page 229).

3. In the property area on the right side of the **Rebar catalog** dialog box, modify the bar properties.

   For example, you can select whether the bar is a main bar, or a tie or stirrup. You may also want to add tags (page 236) to the bar.

   If a property is shown in red, it is missing a value or has a value that is not valid. For example, **Grade** and **Size** must have a value.

4. Click ![save icon] **Save** to save the changes to the rebar catalog.

Delete rebar definitions

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

2. Select (page 229) one or more rebar definitions.

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

4.	Click **Yes** to confirm the deletion.

5.	Click ![save icon] **Save** to save the changes to the rebar catalog.

Work with groups in the rebar catalog

In the rebar catalog, the rebar definitions are arranged to groups. You can add, copy, modify, and delete groups, and arrange the groups according to different properties. The groups are listed on the left side of the **Rebar catalog** and **Select rebar** dialog boxes.

By default, the definitions in the rebar catalog are grouped according to reinforcement grades. You can change how the definitions are grouped (page 234) in the **Rebar catalog** dialog box or in the **Select rebar** dialog box.

To use the newly added or modified rebar definition groups in the model, reopen the model.

Add a new group to the catalog

You can create new groups in the rebar catalog by copying an existing group and the definitions contained in it.

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

2. On the left side of the dialog box, select a group, and then click
   Copy.

   Alternatively, you can right-click a group and select **Copy**.

3. In the **New group name** dialog box, enter a name for the new group, and then click **Copy**.

   Tekla Structures adds the new group to the catalog.

4. Add, modify, and delete definitions (page 228) contained in the new group as needed.

5. Click **Save** to save the changes to the rebar catalog.

Modify a group in the catalog

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

2. Select the group that you want to modify.

3. Select all definitions in the group.

4. In the property area on the right side of the **Rebar catalog** dialog box, modify the group properties.

   For example, you can change the grade or cranked length type. You may also want to add tags (page 236) to all definitions in the group.

5. Click **Save** to save the changes to the rebar catalog.

Delete a group from the catalog

You can delete groups and the definitions contained in them from the rebar catalog.

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

2. Select a group from the list on the left side of the dialog box.

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

4. Click **Yes** to confirm the deletion.

5. Click **Save** to save the changes to the rebar catalog.

Import and export rebar definitions

Use importing and exporting for merging rebar definitions across different catalogs, models, and Tekla Structures environments and versions. To use reinforcing bars and strands in other Tekla Structures models, you can export rebar definitions to a file (`*.inp`), and then import the file into another Tekla Structures model.

TIP You can also download or share rebar catalog content using Tekla Warehouse.

Import definitions to the rebar catalog

You can customize the rebar catalog by importing rebar definitions from an `.inp` file.

1. Open the model to which you want to import rebar definitions.

2. On the **File** menu, click **Catalogs** --> **Rebar catalog** to open the **Rebar catalog** dialog box.

3. Click **Import**.

4. In the **Import rebar definitions** dialog box, browse for the folder that contains the import file, select the file, and then click **Open**.

    Tekla Structures checks if there are duplicates in the definitions in the import file compared to the rebar catalog.

5. If rebar definitions with the same properties as the definitions being imported already exist in the rebar catalog, a confirmation dialog box appears and you have the following three options:

    *   Click **Overwrite** to replace all existing definitions with the newly imported definitions.

    *   Click **Keep existing** to discard the duplicate definitions being imported and to only import the new definitions.

    *   Click **Cancel** to not to import any definitions.

6. Click **Save** to save the changes to the rebar catalog.

7. To use the newly imported definitions in the model, reopen the model.

Export definitions from the rebar catalog

You can export all or selected rebar definitions, or a selected group of a rebar catalog to a file (`.inp`).

1. Open the model from which you want to export rebar definitions.

2. On the **File** menu, click **Catalogs** --> **Rebar catalog** to open the **Rebar catalog** dialog box.

3. Do one of the following:

   - To export the entire catalog, click **Export** --> **Export all**.

   - To export a certain group only, select the group, right-click and select **Export**.

   - To export certain definitions only, select the definitions (page 229) and

     then click **Export** --> **Export selected**.

     Alternatively, you can right-click on one of the selected definitions and then select **Export**.

4. In the **Export as** dialog box, browse for a folder, enter a name for the export file, and then click **Save**.

   By default, Tekla Structures saves the file to the current model folder.

   The file name extension is `.inp`.

Organize the rebar catalog view

You can organize the rebar catalog view in the **Rebar catalog** dialog box to suit your needs and ways of working. For example, you can change how the rebar definitions are grouped, hide certain property columns, or change the order of the property columns. You can also filter definitions and mark them with stars and tags.

Some of these methods work the same way also in the **Select rebar** dialog box; grouping by some of the properties, showing and hiding property columns, changing the order of the columns, filtering, and starring. The **Select rebar** dialog box opens when you click the **...** button next to the **Size** box in a reinforcement object's properties, or in a component dialog box to select a rebar definition.

The status bar at the bottom of the **Rebar catalog** and **Select rebar** dialog boxes shows useful information, such as:

- The number of definitions in the selected group.

- The property by which the definitions are grouped.

- The property by which the definitions are sorted.

  The arrow symbol indicates if the sort order is ascending ▲ or descending ▼.

In the **Rebar catalog** dialog box, the status bar also shows the number of the selected definitions.

The changes you make to the dialog box layout are automatically saved to the `rebar_catalog.settings.UI` file in the `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\Catalogs\` folder. Tekla Structures will use the saved layout next time you open the dialog box.

Show or hide the catalog ribbon

If needed, you can show or hide the ribbon in the **Rebar catalog** dialog box and in the **Select rebar** dialog box.

By default, the ribbon is shown in the **Rebar catalog** dialog box, but hidden in the **Select rebar** dialog box.

- To show the ribbon, click the down arrow ⌄ at the right end of the (**Home**) ribbon title bar.

- To hide the ribbon, click the up arrow ⌃ at the right end of the (**Home**) ribbon title bar.

Change the grouping of rebar definitions

You can select the property by which the rebar definitions are grouped in the rebar catalog. By default, the rebar definitions are grouped by grade.

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

   Alternatively, you can use the **Select rebar** dialog box.

2. Click [icon] **Group by**, and then select the property by which you want to group the rebar definitions.
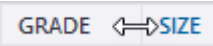
   The definitions can be grouped by the properties whose property columns are visible. For example, you can select **Size** or **Cross section area**.

   The properties that are available may vary in the **Rebar catalog** and **Select rebar** dialog boxes.

Work with property columns in the catalog view

You can organize the rebar catalog view in the **Rebar catalog** dialog box and in the **Select rebar** dialog box by showing and hiding the property columns, and by changing the order, sort order, and width of the columns.

The **Star** column is always visible and you cannot hide it.

To	Do this
Show or hide a property column	1. Click **Show columns** to open a list of the available property columns. A check mark in front of a column name indicates that the column is visible. 2. To show a column, click the column name to add a check mark in front of the column name. 3. To hide a column, click the column name to remove the check mark.
Change the order of the property columns	Drag a column header to a new location.
Change the sort order of a property column	Click the column header. The arrow symbol next to the column header indicates if the sort order is ascending ▲ or descending ▼. To sort values by two properties and in two columns: 1. Sort by one column. 2. Hold down **Shift** and then sort by the other column.
Resize a property column	Drag the edge between this and the following column header. For example: GRADE ⟺ SIZE In the **Rebar catalog** dialog box, you can also click **Fit columns** to adjust the widths of the visible columns so that the longest value in each column is shown.

Filter rebar definitions

You can filter rebar definitions in both the **Rebar catalog** dialog box and the **Select rebar** dialog box. You can use filtering together with the other

methods, such as sorting, to narrow down the number of definitions shown in the rebar catalog view.

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

   Alternatively, you can use the **Select rebar** dialog box.

2. In the **Filter** box, enter the search term or filtering criteria.

   For example, to find rebar definitions that are suitable for stirrups and ties, enter `tie`.

   Tekla Structures shows the definitions that have **Usage** set to **tie/stirrup**.

Add stars to rebar definitions

You can mark important or preferred rebar definitions with stars, so that you can easily find these definitions later. The definitions that are marked with yellow stars appear in the **Starred** group in the rebar catalog. Starring is user-specific, so it is only visible to you.

The starring settings are stored in the current model folder in the `rebar_catalog.settings.user.<username>` file, where the `<username>` suffix is your username.

If you have starred definitions, the **Rebar catalog** dialog box opens with the **Starred** group selected.

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

   Alternatively, you can use the **Select rebar** dialog box.

2. Browse or search for the definitions that you want to mark with stars.

3. In the definition list, click the white star symbol in the **Star** column for each definition that you want to add to the **Starred** group.

   By default, the **Star** column is the first column and the star symbol is at the beginning of each definition row.

   The star symbol turns yellow ⭐ and the definition is added to the **Starred** group.

4. To remove the starring from a definition, click the yellow star symbol on the definition row.

   The star symbol turns white again and the definition is removed from the **Starred** group.

Add tags to rebar definitions

In the **Rebar catalog** dialog box, you can add tags to rebar definitions. You can use tags to add keywords or other metadata to the definitions.

For example, you could use tags like `Stainless` and `Acid proof`.

Tags are model-specific and saved to the `rebar_catalog.settings` file in the current model folder.

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

2. that you want to tag.

3. Enter the tag in the **Tags** box at the bottom-right corner of the **Rebar catalog** dialog box, and then press **Enter**.

   To add several tags to a definition, enter the next tag in the next tag box and press **Enter**.

   Each group of tagged definitions appears with the 🏷 symbol in the list of groups, after the **Starred** group:
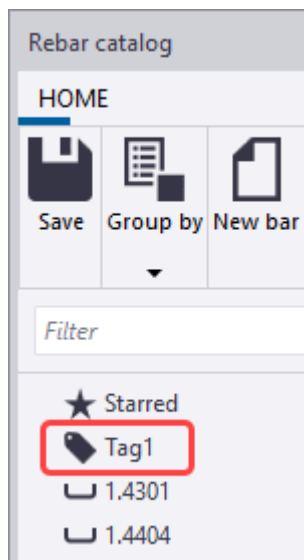
4. To remove a tag from a definition, select the definition and click the **X** symbol after the tag name in the **Tags** section in the property area.

5. To delete a tag completely, select the tagged group, select all the definitions in the group, and then click the **X** symbol after the tag name in the **Tags** section in the property area.

6. Click **Save** to save the changes to the rebar catalog.

4.13 Customize the Applications & components catalog

You can modify the catalog definition settings of the **Applications & components** catalog using catalog definition files, and set up a group structure to suit the needs of your company. Always check the settings and the group structure when upgrading to a new Tekla Structures version.

Catalog definition files (`ComponentCatalog.xml`) can be located in folders pointed by XS_SYSTEM, XS_FIRM, XS_PROJECT, and in the model folder. If there are several catalog definition files, Tekla Structures combines the information in the files. For more information on the folder search order, see Folder search order (page 334).

When you create a group structure for the **Applications & components** catalog, define the highest level structure in a catalog definition file that is located in a folder pointed by `XS_SYSTEM`. To hide unnecessary parts of the group structure and catalog content from certain roles, edit the catalog definition files of these roles.

For general instructions on how to use the **Applications & components** catalog, see How to use the Applications & components catalog.

Edit the catalog

1. Set the XS_COMPONENT_CATALOG_ALLOW_SYSTEM_EDIT advanced option to `TRUE` to edit the catalog definition files.

2. In the **Applications & components** catalog, click **Access advanced features** > **Catalog management** > **Edit mode**, and select the catalog definition file that you want to edit.

   The list of files shows all the environment folders, the project and firm folders if defined, and the model folder. You can define the needed catalog definition file folder paths in `XS_SYSTEM`.

   If `XS_COMPONENT_CATALOG_ALLOW_SYSTEM_EDIT` is not set to `TRUE`, a small warning icon is shown next to the files in the `XS_SYSTEM` folder locations. The image shows warning icons next to the files that appear dimmed.
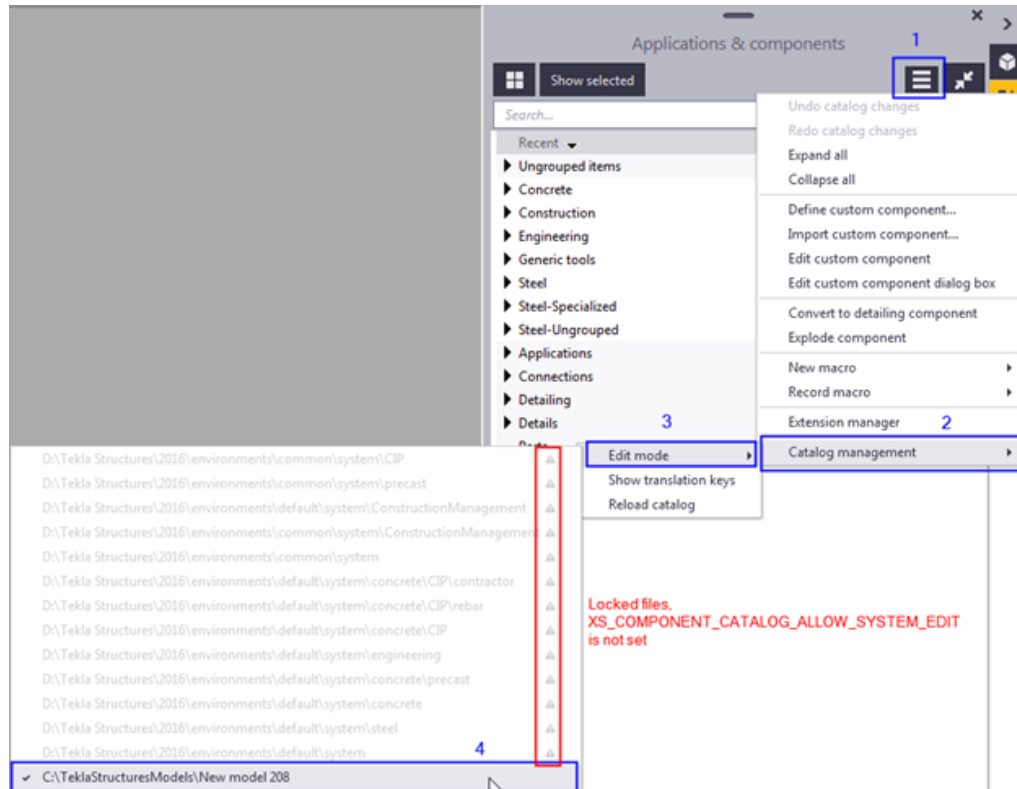
The files that appear dimmed do not exist, but you can create the files by selecting them, and answering **Yes** in the **Edit mode** message box.
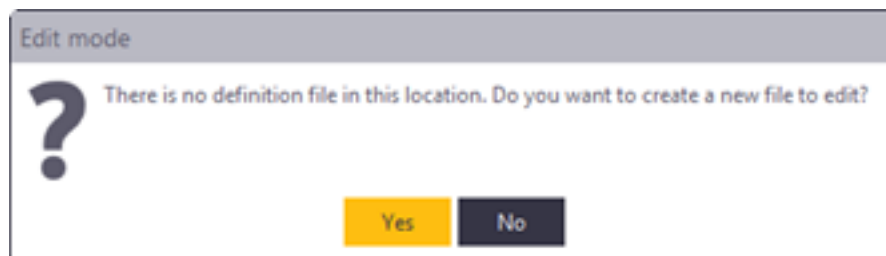
You can remove an existing file by clicking the [×] button next to the file.
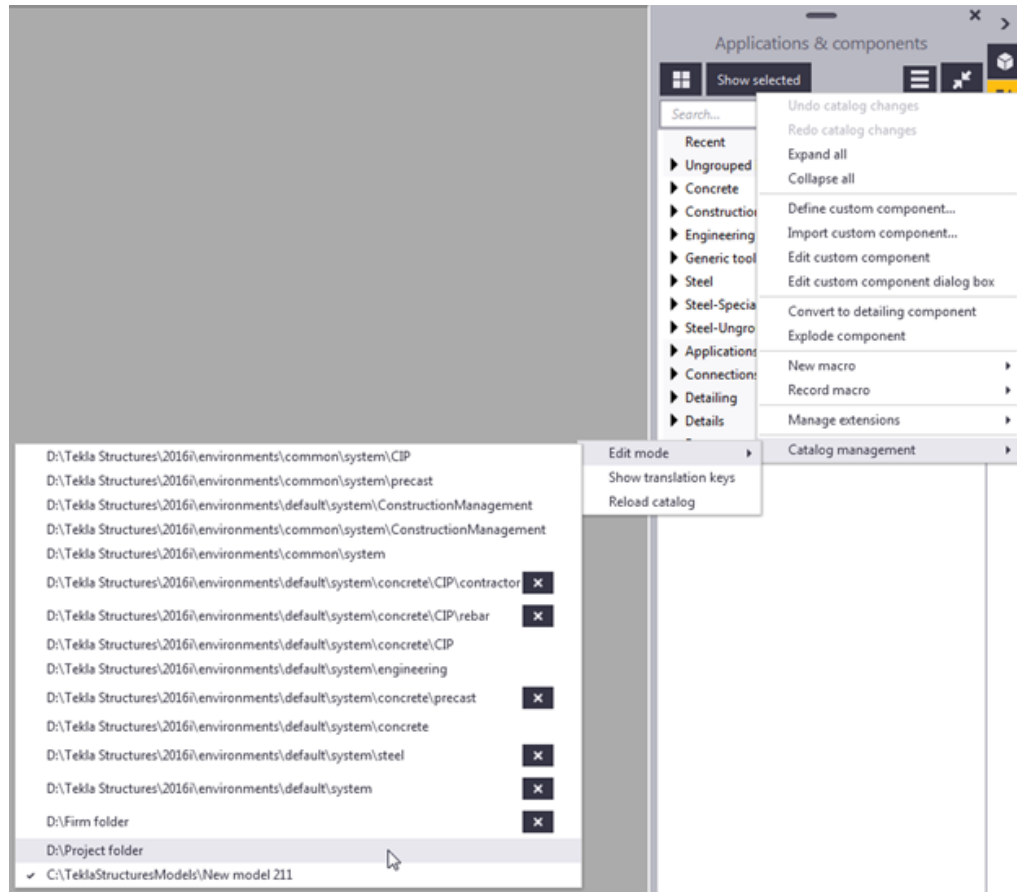
3. Select the file that you want to edit.

The check mark in front of the folder name shows the file that is currently being edited.
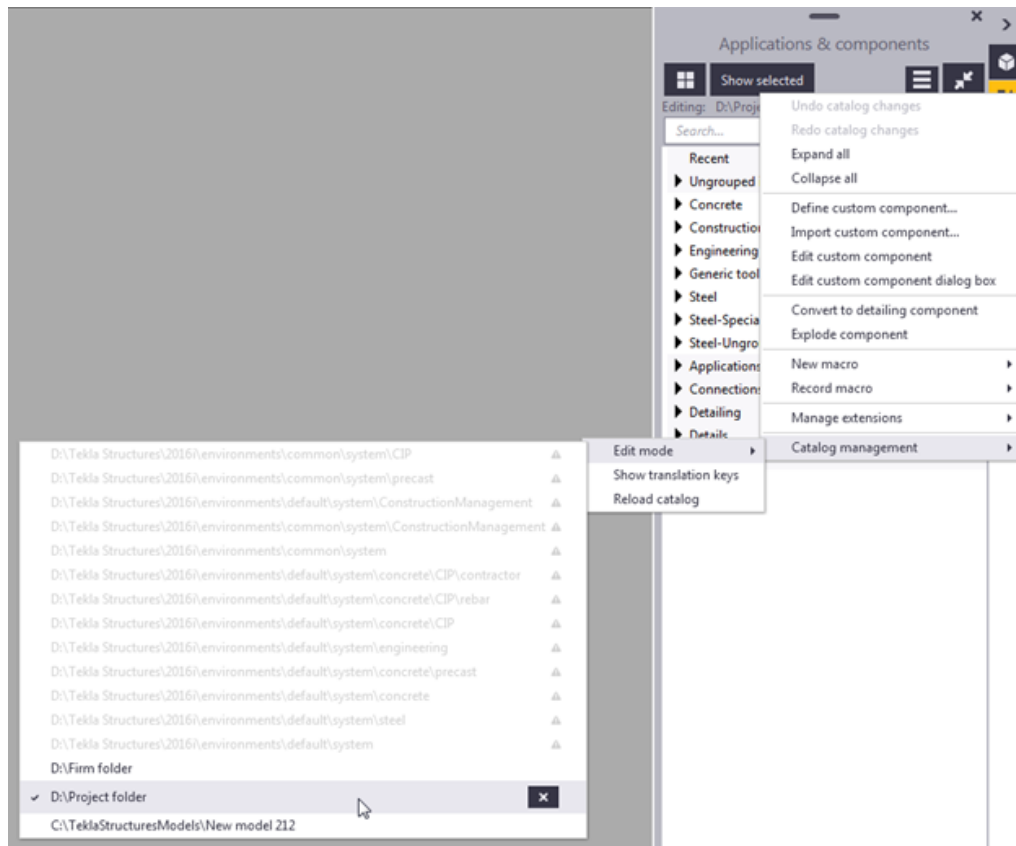
4. Create new groups and subgroups to organize the catalog content, right-click in the catalog and select **New group...**.

5. Move the content from **Ungrouped items** to the new groups, or to other predefined custom groups. To move an item to another group, right-click the item, select **Add to group**, and then select the target group.
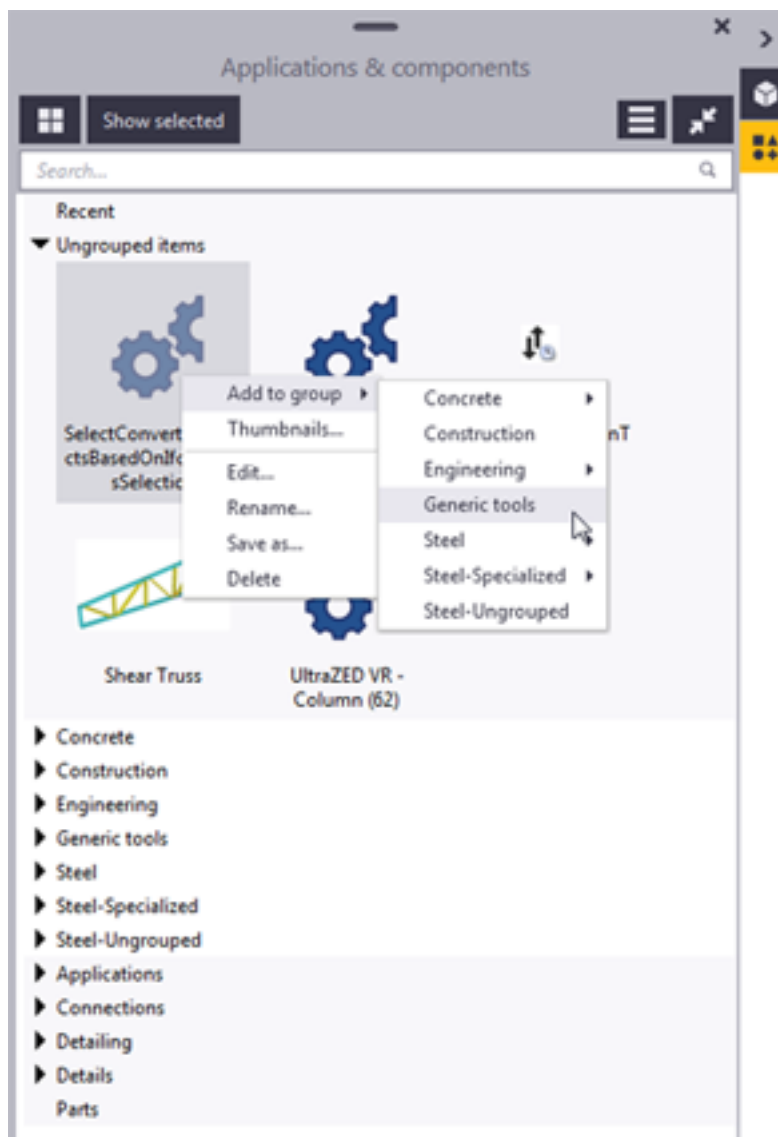
It is important to keep the **Ungrouped items** group empty, because all items downloaded from Tekla Warehouse are placed in that group. When you place an item to a predefined group, it is automatically removed from the ungrouped items.

For instructions on how to collect content to a group and publish it as a catalog definition file, see .

Maintain the catalog

To keep the **Applications & components** catalog structure and content clear and in order, keep the groups up to date and organized, and remove the unnecessary items from the catalog definition files.

1. Click ⊗ in the bottom-right corner in the **Applications & components** catalog to display the message log:
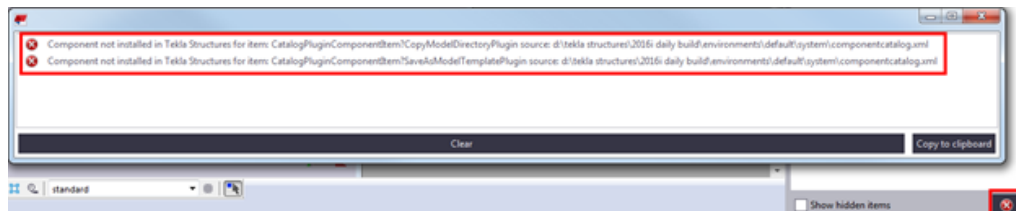
   If an item defined in a catalog definition file is removed from the Tekla Structures software, the removed item will be included in the **Applications & components** catalog error message log.

2. If the log contains references to missing items, edit the relevant `ComponentCatalog.xml` file to remove the references manually.

   We recommend that you make a back-up copy of the file before you start editing.

3. Test thoroughly that these changes do not create any further errors, or mess up the group structure in the **Applications & components** catalog. Check at least the **Ungrouped items** and **Legacy catalog** groups.

4. Newly added items are placed in the **Ungrouped items** group. If there are new items in the group, move them to the appropriate predefined groups, and hide them from specific roles, if needed.

5. Add suitable thumbnails to the items, if needed.

5 Files and folders in Tekla Structures

Sometimes you need to know where Tekla Structures stores information, and the types of files that Tekla Structures contains, where the files are located, and how the files should be should be used.

Tekla Structures contains a large amount of files that affect the way the software works. It is important to know which file controls which functionality, and also which files we do not recommend that you touch.

The initialization file reading order is also very important. You need to know the order in which the files are read when you open Tekla Structures, so that you do not modify the files unnecessarily.

See also

Initialization files (.ini files) (page 246)

Input files (.inp files) (page 276)

File storing options and advanced options (page 254)

Data files (.dat files) (page 290)

Message files (page 291)

Standard files (page 293)

Property files (page 292)

Catalog files (page 296)

Font files and font conversion files (page 299)

Symbol files (page 299)

Image files (page 301)

Files related to templates, reports and drawings (page 300)

Log files (page 301)

Model folder files and file name extensions (page 310)

5.1 Create project and firm folders

Use project and firm folders for customized files. These can be custom ribbons, drawing styles, profile and material catalogs, or any other settings you want to store for future use. You can use the same files each time you start a new model or install a new version of Tekla Structures. This also means you can easily revert back to the default settings, because you have not overwritten any of the system files.

Use the **project folder** and its sub-folders to store customized files that are only used in a particular project. A project may consist of several models done by separate teams, all spread out in different locations. You can save project-specific files and settings in the project folder, so that everyone in the project can use them. A project may also consist of one model that is shared by different companies.

Use the **firm folder** and its sub-folders to store customized files for the entire organization or company. The settings and files in the firm folder are meant to be used in all projects within the company. For example, let's say you regularly work for a company that has specific drawing layout standards it expects you to use. Customize the drawing templates once for the company and save them in the firm folder or in a sub-folder of the firm folder. You can then use the customized drawing templates for all future projects for that company.

When working within one company, the firm and project folders are usually located in network folders so that everyone can access them. In collaborative projects that include multiple teams or companies, you can use a folder in the linked .

Project and firm folders are defined by `XS_FIRM` and `XS_PROJECT`. When working in a model sharing project, each company needs to have its own firm settings in a folder defined by `XS_FIRM`, and a common project folder for project settings defined by `XS_PROJECT`. It may be useful to create a startup shortcut (page 19) on your desktop for each project containing all necessary folders.

WARNING   Changing an advanced option value in `.ini` files located outside the model folder does not affect the existing models. You can only update advanced options in the **Advanced Options** dialog box or in the `options.ini` file located in model folder; not from an `options.ini` file located in folders defined for the advanced options XS_FIRM or XS_PROJECT. The `.ini` files are read also when you open an existing

model, but only new advanced options that do not exist in `options_model.db` or `options_drawings.db` are inserted, for example, such options that are not yet in the **Advanced Options** dialog box but have been added in the software.

Create a project or firm folder

1. Create an empty folder in a shared location, for example on a network drive.

2. Name the folder appropriately.

3. In Tekla Structures, go to the **File** menu and click **Settings** --> **Advanced options**.

4. In the **File Locations** category, define the path to the firm or project folder you created in step 1 for the advanced option `XS_FIRM` or `XS_PROJECT`.

5. Restart Tekla Structures for the change to take effect.

See also

Folder search order (page 334)

Typical initialization files (.ini files) and their reading order (page 247)

5.2 Initialization files (.ini files)

Initialization files are used for defining Tekla Structures start-up parameters and default settings. They contain advanced options that are used for configuring Tekla Structures for different standards, and for your or your company's style of working.

Tekla Structures automatically creates the necessary initialization files (page 247) during installation. The number of initialization files it creates depends on how many Tekla Structures environments you have installed.

NOTE If you are defining a switch for an advanced option in an `.ini` file, use double percent signs %%xxx%% around the switch. If you are defining a switch in the **Advanced Options** dialog box, use single percent signs %xxx% around the switch. For example, `%%BOLT_NUMBER%%*D%%HOLE.DIAMETER%%` for the advanced option `XS_BOLT_MARK_STRING_FOR_SIZE`.

See also

Global default environment settings - env_global_default.ini (page 251)

Local environment settings - env_<environment>.ini (page 252)

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

Below is a list of all the typical initialization files that are read when Tekla Structures is started. The numbers indicate their reading order at startup. If there are conflicting settings, the ones read later override the ones read earlier.

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

To check the files that have been read and their reading order, go to **File menu** --> **Logs** --> **Session history log** .

File and reading order	Description
1. `fonts_<lang>.ini`	This file is optional, and it is only needed for languages using special characters. One example is the `fonts_jpn.ini` file for the Japanese language.
	This file is read from `Tekla Structures\<version>\nt\bin\` if it is available. It is installed to the `..\nt\bin` folder when Tekla Structures is installed.
	NOTE: Do not change these settings.
2. `teklastructures.ini`	The file `teklastructures.ini` starts Tekla Structures. It is read from `..\Program Files\Tekla Structures\<version>\nt\bin\`.
	This file contains basic system settings, such as the location of software and environment files. This file is installed to the `..\nt\bin` folder when Tekla Structures is

File and reading order	Description
	installed. It is always read at Tekla Structures startup.
	NOTE: Do not change these settings.
3. `lang_<lang>.ini`	This file contains the language settings. It is read from `..\Program Files\Tekla Structures \<version>\nt\bin\`.
	This file is installed to the `..\nt\bin` folder when Tekla Structures is installed.
	Which `lang_<lang>.ini` files exist in the `..\nt\bin` folder depends on which languages you have selected to install during the software installation.
	The language that is read depends on the language you have selected in **File menu** --> **Settings** --> **Change language** in the previous Tekla Structures session.
	NOTE: Do not change these settings.
4. `env_global_default.ini`	This file is used as a default for all environments and contains the global settings. The settings in the `env_global_default.ini` file provide the basics for all environment settings globally. The settings in this file can be localized and specified differently in an environment-specific initialization file that is read later than this file.
	This file is always read at Tekla Structures startup from `..\ProgramData\Trimble \Tekla Structures\<version> \environments\common\` and is installed there from the common environment installation package.
	NOTE: Do not change these settings.
5. All `.ini` files defined in shortcut/ command line with `-I <name>.ini`	Usually none.
6. `env_<environment>.ini`	The `env_<environment>.ini` files contain all the advanced options that

File and reading order	Description
	have environment-specific settings. They are read from the environment folder `..\ProgramData\Trimble \Tekla Structures\<version> \environments\`. The exact location may vary depending on your environment.
	The `env_<environment>.ini` files that exist on your computer depends on which environment packages you have installed. Which `env_<environment>.ini` file is read depends on the environment that you select in the Tekla Structures startup dialog box.
	NOTE: Do not change these settings.
7. `role_<role>.ini`	The `role_<role>.ini` files contain all the advanced options that have typical role-specific settings. They are read from the environment folder `..\ProgramData\Trimble \Tekla Structures\<version> \environments\`. The exact location may vary depending on your environment.
	The available roles depend on the environments you have installed.
	You can select the role in the Tekla Structures startup dialog box.
	For example, this file defines that the US environment imperial role uses imperial units, shows the fractions correctly, and understands input as imperial. In US environment metric role metric units are used.
	NOTE: Do not change these settings.
8. All `.ini` files defined in shortcut/ command line with `-i <name>.ini`	Usually none.
9. `company.ini`	The `company.ini` file is useful especially for big companies that want to unify certain enterprise-level settings. This file is read from a folder specified with the advanced option XS_COMPANY_SETTINGS_DIRECTORY.

File and reading order	Description
	This file is read only if the advanced option `XS_COMPANY_SETTINGS_DIRECTORY` is set.
	This file is created by the system administrator when necessary, it is not created by the installation.
10. `user.ini`	The `user.ini` file is where you can save your personal user settings.
	This file is located in the same location as the user-specific `options.bin` file, for example, `C:\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UserSettings`.
	The `user.ini` is created in the above mentioned location when you start Tekla Structures for the first time and create and save a model using the current version. It is read when you start Tekla Structures.
	The changes you make in the advanced options in the **Advanced Options** dialog box override the settings in all other initialization files, if the advanced option exists in both locations.
	If `user.ini` has system options they are read always when Tekla Structures is opened.
	If `user.ini` has model-specific options they are used when new model is created.
	If `user.ini` has user-specific options they are used when Tekla Structures is used for the first time.
11. `options.ini` in system folder	The folder is specified with the advanced option XS_SYSTEM.
12. `options.ini`, firm-specific, if any exist **13.** `options.ini`, project-specific, if any exist	The `option.ini` files containing firm- or project-specific model settings are saved in and read from user-defined locations specified with the advanced options XS_FIRM and

File and reading order	Description
	XS_PROJECT. They work in the specified way for the firm in question, or for the specified project if the model has been set up to read settings from these locations, and if the user has manually moved the `options.ini` file to these locations. An `options.ini` is created in the firm or project folder when you copy or move it there.
	Updating of model-specific and user-specific advanced options can only be done from the **Advanced Options** dialog box or `options.ini` located in model folder, not from the firm- or project-specific `options.ini` files.
	The `options.ini` in the firm or project folder is read when you start Tekla Structures or open the model.
14. `options.ini`, model-specific	The `options.ini` in the model folder.

See also

Create start-up shortcuts with customized initializations (page 19)

Settings defined by advanced options (page 274)

Global default environment settings - env_global_default.ini

The `env_global_default.ini` file defines the global defaults for advanced options. The file is read from `..\ProgramData\Trimble\Tekla Structures\<version>\environments\common\`.

WARNING Do not modify the `env_global_default.ini` file. If you need to modify some environment settings, copy the needed advanced options from this file to your user.ini (page 253) file and modify the settings there, or modify the settings in the **Advanced Options** dialog box.

For advanced options that are set according to your local standards, see the environment settings file env_<environment name>.ini (page 252) and the role

settings file role_<role name>.ini (page 252). The local files override the advanced options set in `env_global_default.ini`.

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

See also

Local environment settings - env_<environment>.ini

The `env_<environment>.ini` file contains advanced options that are set according to local standards and are different from the global defaults. The file is read from the environment folder `..\ProgramData\Trimble\Tekla Structures\<version>\environments\`. The exact location may vary depending on your environment.

WARNING Do not modify the `env_<environment>.ini` file. If you need to modify some settings, copy the needed advanced options from this file to your user.ini (page 253) file and modify the settings there, or modify the settings in the **Advanced Options** dialog box.

The global default environment settings file env_global_default.ini (page 251) contains a complete listing of advanced options. The local files override the advanced options set in `env_global_default.ini`.

See also

Role settings - role_<role>.ini

The `role_<role>.ini` files contain all the advanced options that have typical role-specific settings. The file is read from the environment folder `..\ProgramData\Trimble\Tekla Structures\<version>\environments\`. The exact location may vary depending on the environment.

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

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to your user.ini (page 253) file and modify the settings there, or modify the settings in the **Advanced Options** dialog box.

The `role_<role>.ini` file contains advanced options that are set according to typical role requirements in your local area. These settings are different from your environment settings in env_<environment name>.ini (page 252). The global default environment settings file env_global_default.ini (page 251) contains a complete listing of advanced options. The advanced option settings in `role_<role>.ini` override the ones in `env_<environment>.ini`

See also

Typical initialization files (.ini files) and their reading order (page 247)

Add an advanced option to the user.ini file

You can save your personal user settings to the `user.ini` file. The `user.ini` file is located in the same location as the user-specific `options.bin` file, for example, `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UserSettings`.

NOTE We recommend that you add only system-specific (page 274) advanced options to the `user.ini` file. You can also add model-specific (page 274) advanced options, but the model-specific advanced options only affect new models that you create. Adding user-specific advanced options in `user.ini` may not work as desired as `options.bin` is loaded after `user.ini` and may override the value.

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1. Right-click the `user.ini` file in Windows Explorer and select **Open with**. Select a standard text editor from the list of available programs.

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

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

3. Save `user.ini`.

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

Possible values	Example
TRUE	set XS_DISABLE_WELD_PREP_SOLID=TRUE
FALSE	set XS_UNDERLINE_AFTER_POSITION_NUMBER_IN_HARDSTA MP=FALSE
1	set XS_SINGLE_CLOSE_DIMENSIONS=1
0	set XS_SINGLE_USE_WORKING_POINTS=0

Possible values	Example
string value	`set XS_USER_DEFINED_BOLT_SYMBOL_TABLE=bolt_symbol _table.txt`
switches	`set XS_ASSEMBLY_FAMILY_POSITION_NUMBER_FORMAT_STR ING=%%TPL:PROJECT.NUMBER%%` Use two switches.

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

See also

5.3 File storing options and advanced options

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

What happens at model creation

When a new model is created, Tekla Structures reads model-specific option and advanced option values from the `standard.opt` file, and from the `.ini` files in a certain reading order (page 247), and creates the databases `options_model.db` and `options_drawings.db`, and the `options.ini` file under the model folder.

Changing a model-specific options or advanced options

- When you change a model-specific (page 274) option or advanced option and press **OK** or **Apply** in the **Options** or **Advanced Options** dialog box, the settings are taken into use (otherwise you will get a warning message).

- The updated model-specific option or advanced option settings are saved in `options_model.db` and `options_drawings.db` under model folder when the model is saved.

- In addition, there are also some special model-specific advanced options that can be updated from the `options.ini` file located in the model folder, for example, new advanced options that are not yet in the **Advanced Options** dialog box.

- You can change model-specific advanced options only in the **Advanced Options** dialog box or in the `options.ini` file that is located in model folder.

- You can change model-specific options only in the **Options** dialog box manually or by loading `standard.opt` file values in the dialog box.

Changing a user-specific options or advanced options

- When you change a user-specific (page 274) option or advanced option, and press **OK** or **Apply** in the **Options** or **Advanced Options** dialog box, the settings are saved in `options.bin` in `..\Users\<user>\AppData \Local\Trimble\Tekla Structures\<version>\UserSettings`.

- You can change user-specific advanced options only in the **Advanced Options** dialog box.

- You can change user-specific options only in the **Options** dialog box manually or by loading `standard.opt` file values in the dialog box.

Saving customized settings in the Options dialog box

- You can save your own model-specific settings in the Options dialog box by using the **Save** button. Then the `standard.opt` file is saved in the `\attributes` folder under the model folder.

Creating a list of advanced options and their values

- You can create a complete list of advanced options in a text file by clicking **Write to file** in the **Advanced Options** dialog box. The list shows the name of the advanced option, current value and type.

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

Settings in the Options dialog box

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

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

The model-specific (page 274) settings in this dialog box are saved in the `options_model.db` and `options_drawings.db` databases in the model folder, and the user-specific (page 274) settings in `options.bin` in your local `<user>` folder. Changing user- or model-specific options in the **Options** dialog box does not require Tekla Structures restart.

You can also save your own settings by using the **Save** button. Then the `standard.opt` file is saved in the `\attributes` folder under model folder. You may want to copy this file to your firm folder. When you create a model, the `standard.opt` is read from the firm folder.
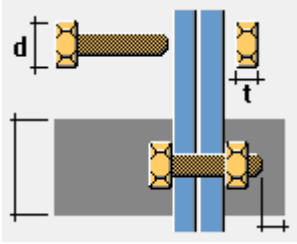
The options in the **Options** dialog box are described below.

Clash check settings

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

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

Option	Description
Allowed penetration volume	Defines the allowed clash check tolerance if small collisions are acceptable and can be ignored.
	If the clashing volume is smaller than the given value, for example 1 mm^3, then the clash is not reported.
	Enter the value in the current volume units.
Clash check between bolt and bolted part	Defines whether the model is checked for clashes that occur between bolts and the related bolted parts.
	If you select **Yes**, Tekla Structures will check the bolts against the real geometry of the bolted part profiles including roundings, and using the real bolt dimensions.

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

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

Components settings

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

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

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

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

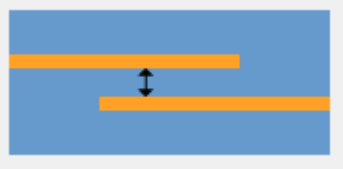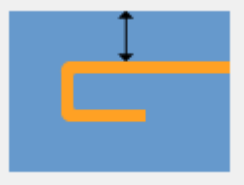| Option	Description
Profile names	Defines parametric profile prefixes for plates. It is important that profile names are set up correctly so that you can use filters and wizards effectively.
	Profile names must exist in the profile catalog. If you want to use a parametric profile that does not have a name in the catalog, first add it to the **Profile Catalog**, then enter it here. Tekla Structures uses the **Folded plate** prefix when you use the folded plates in components.
Bolts	In components, Tekla Structures uses **Factor of bolt edge distance** and **Compare edge distance to** to check that the bolts it creates are not too close to the edge of a part, and warns you if they are. Check that **Factor of bolt edge distance** is set according to the standard you are using. The default edge distance setting depends on your environment.
	Compare edge distance defines whether the edge distance checks are based on bolt or hole diameter.
	To define the default bolt properties to use in connections, select a **Bolt standard** and **Bolt size**.
Parts	**Part material** defines the default part material grade.
	Part start numbers defines start numbers for parts that are **Welded to primary** and **Welded to secondary**, **Loose parts**, and **Assembly loose parts**.
	Cross-check these settings against the numbering series you define to make sure they do not overlap. If they overlap, Tekla Structures may create two non-identical parts with the same part number. This generates an error in the Numbering history log file (page 307).

Drawing dimensions settings

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

For more information about dimension settings, see

Option	Description
Exaggeration	This setting defines the default values for **Exaggeration limit** and **Exaggeration scaling**.
	When you enable the exaggeration of the dimensions, a drawing dimension that is narrower than the defined limit is expanded. **Exaggeration limit** defines the default value for this limit.
	Exaggeration scaling defines whether you are using **Paper** or **Model** as the exaggeration scaling method:
	• If you select **Paper**, the exaggeration limit is multiplied by the view scale.
	• If you select **Model**, and the scale is 1:10, all the dimensions smaller than 10 mm are exaggerated regardless of the drawing scale.
	For more information about exaggerated dimensions, see .
Absolute dimensions	**Show zero in absolute dimensions** --> **Yes** shows zero at the zero points in absolute dimensions.
	Draw absolute dimension values parallel to dimension line --> **Yes** shows dimensions parallel to dimension lines in absolute dimensions.
	For more information, see
Dimensions in tags	**Units**, **Format** and **Precision** define the default unit, format and precision used in dimension tags.
	Available units: mm, cm, m, foot - inch, cm / m, inch, feet.

Option	Description
	Available formats: ###, ###[.#], ###.#, ###[.##], ###.##, ###[.###], ###.###, ### #/# and ##$^{\#}$/##.##$^{\#}$.
	Available precision: 0.00, 0.50, 0.33, 0.25, 1/8, 1/16, 1/32, 1/10, 1/100, 1/1000
Show dimension in middle tag of automatic dimension	Defines whether you want to create dual dimension tags in assembly, single-part, cast unit, or general arrangement drawings.
	For more information about automatic dual dimensions, see .
	For more information about manual dual dimensions, see
	When Tekla Structures creates the drawing, it adds the lower dimension tag in the selected unit, format and precision.
Dimension line	**Dimension line extension length for line arrow** defines the length of the line extension for dimensions that have line arrows.
	Note that line extensions are not applied to dimensions that have different arrows from line arrows, and certain knock-off dimension types.

Drawing objects settings

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

Option	Description
Edge chamfer	**Line color** defines the default line color of the edge chamfers in drawings.
	Line type defines the default line type of the edge chamfers in drawings.

Option	Description
	These values are overridden by the values set in the **Edge Chamfer Properties** dialog box.
	For more information about edge chamfers, see .

General settings

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

Option	Description
Autosave	**Autosave interval: Autosave after every xx modeling or editing commands** defines how often Tekla Structures automatically saves a model and a drawing.
	This number represents the number of commands you have given. For example, if you create many objects without interrupting (**Esc**), it counts as one command.
	Autosave after creating every xx drawings defines the number of drawings after which Tekla Structures automatically saves your work.
	For more information, see:
Default adaptivity	**Off** means that adaptivity is not defined.
	Relative defines that handles retain their relative distances to the nearest part faces in relation to the part's overall size.
	Fixed defines that handles retain their absolute distances to the nearest part faces.
	You can also modify the adaptivity settings for each part separately. These modifications override the

Option	Description
	default settings in the **Options** dialog box.
	For more information about adaptivity, see

Load modeling settings

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

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

NOTES:

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

- You should not need to change the building code or safety factors during the project. If you change these settings, you will also need to change the load group types and check the load combinations.

Numbering settings

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

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

Orientation mark settings

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

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

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

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

Rebar set settings

NOTE: Settings on this page are model specific and only apply to rebar sets, not to single reinforcing bars, reinforcing bar groups, or reinforcement meshes. Changing the settings does not require Tekla Structures restart, but you need to use the **Rebar set** --> **Regenerate rebar sets** command on the **Concrete** tab to apply the changes to existing rebar sets in the model.

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

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

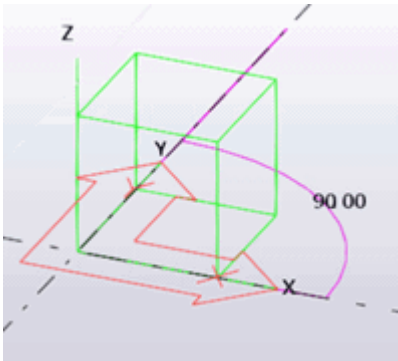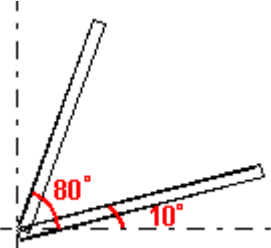| Option	Description
Step tapering	Define the tapering step values for straight bars, first and last legs, and intermediate legs. Step tapering settings are also available in the **Rebar set** properties and in the **Rebar property modifier** properties.

Units and decimals settings

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

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

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

Option	Description
Length	**mm**, **cm**, **m**, **in (decimal)**, **ft (decimal)**, **ft-in**
Angle	**°**, **rad**
Spring constant	kg/m kg/cm kg/mm T/m T/cm T/mm N/m N/cm N/mm daN/m daN/cm daN/mm kN/m kN/cm kN/mm lbf/in lbf/ft kip/in kip/ft

Option	Description
Rot. spring constant	kgm/rad kgm/° Tm/rad Tm/° Nm/rad Nm/° daNm/rad daNm/° kNm/rad kNm/° lbf-in/rad lbf-in/° lbf-ft/rad lbf-ft/° kip-in/rad kip-in/° kip-ft/rad kip-ft/°
Factor	(unitless)
Force	kg T N daN kN lbf kip
Distributed load	kg/m T/m N/m daN/m kN/m lbf/in lbf/ft kip/in kip/ft
Surface load	kg/m^2 T/m^2 N/m^2 daN/m^2 kN/m^2 psi psf ksi ksf

Option	Description
Moment	kgm Tm Nm daNm kNm lbf-in lbf-ft kip-in kip-ft
Distributed moment	kgm/m Tm/m Nm/m daNm/m kNm/m lbf-ft/ft kip-ft/ft
Temperature	$^{\circ}$**C**, $^{\circ}$**F**, **K**
Deformation	mm cm m in (decimal) ft (decimal) ft-in
Section dimension	mm cm m in (decimal) ft (decimal) in ft-in
Angle	$^{\circ}$, **rad**
Area	mm^2 cm^2 m^2 in^2 ft^2
Section modulus	mm^3 cm^3 m^3 in^3 ft^3
Moment of inertia	**mm4**, **cm4**, **in4**

Option	Description
Radius of inertia	mm cm m in (decimal) ft (decimal) ft-in
Torsion constant	**mm4**, **cm4**, **in4**
Warping constant	**mm6**, **cm6**, **in6**
Cover area	m^2/m mm^2/m cm^2/m ft^2/ft in^2/ft in^2/in
Strength	kg/m^2 kg/cm^2 kg/mm^2 T/m^2 T/cm^2 T/mm^2 N/m^2 N/cm^2 N/mm^2 daN/m^2 daN/cm^2 daN/mm^2 kN/m^2 kN/cm^2 kN/mm^2 psi psf ksi ksf

Option	Description
Modulus	kg/m² kg/cm² kg/mm² T/m² T/cm² T/mm² N/m² N/cm² N/mm² daN/m² daN/cm² daN/mm² kN/m² kN/cm² kN/mm² psi psf ksi ksf
Density	kg/m³ T/m³ N/m³ kN/m³ lbf/ft³
Weight	kg T N lbf kip
Strain	**o/oo**, **%**, (unitless)
Thermal dilat. coeff.	**1/°C**, **1/°F**, **1/K**
Ratio	**o/oo**, **%**, (unitless)
Volume	mm³ cm³ m³ in³ ft³
Length	**mm**, **cm**, **m**, **in (decimal)**, **ft (decimal)**, **ft-in**
Angle	**°**, **rad**

Option	Description
Reinforcement area	mm² cm² m² in² ft²
Transverse reinforc.	m²/m mm²/m cm²/m ft²/ft in²/ft in²/in
Weight	kg T N lbf kip
Mass/Length	kg/m T/m N/m daN/m kN/m lbf/ft
Volume	mm³ cm³ m³ in³ ft³
Force	kg T N daN kN lbf kip
Distributed load	kg/m T/m N/m daN/m kN/m lbf/in lbf/ft kip/in kip/ft

Option	Description
Surface load	kg/m² T/m² N/m² daN/m² kN/m² psi psf ksi ksf
Moment	kgm Tm Nm daNm kNm lbf-in lbf-ft kip-in kip-ft
Temperature	$^{\circ}$C, $^{\circ}$F, K
Stress	kg/m² kg/cm² kg/mm² T/m² T/cm² T/mm² N/m² N/cm² N/mm² daN/m² daN/cm² daN/mm² kN/m² kN/cm² kN/mm² psi psf ksi ksf
Deformation	mm cm m in (decimal) ft (decimal) ft-in

See also

Settings defined by advanced options

Advanced options can be user-, model-, system or role-specific:

- **User-specific advanced options** are saved in your local `options.bin` file, which is by default located in `C:\Users\<user>\AppData\Local \Trimble\Tekla Structures\<version>\UserSettings`, and work in the specified way in all models that you have. The folder can be changed using the advanced option XS_USER_SETTINGS_DIRECTORY. In the **Advanced Options** dialog box, the type is **USER**. Some user-specific advanced options require restarting of Tekla Structures after changing the value.

- **Model-specific advanced options** work in the specified way only in the current model. They are saved to `options_model.db` and `options_drawings.db` under model folder. In the **Advanced Options** dialog box, the type is **MODEL** or **DRAWING**. Some special model-specific options that are not visible in the **Advanced Options** dialog box can be changed from `options.ini` file under the model folder.

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

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

  - **Global system settings** are read from common env_global_default.ini (page 251) in `..\ProgramData\Trimble\Tekla Structures \<version>\environments\common\`. These settings are used in all environments.

  - **Environment-specific system settings** are read from env_<environment>.ini (page 252) in your environment folder. They override any settings that are defined on a global level in `env_global_default.ini`.

  - **Role-specific system settings** are read from role_<role>.ini (page 252) in environment folder. They override any settings that are defined on a

global and environment level in `env_global_default.ini` and `env_<environment>.ini`.

- **Company level system-specific system settings** override all other system-specific advanced options. You can save them in the firm or project folders by setting the folders for the advanced options and .

- **SYSTEM(ROLE)** options are typically role specific. The settings are read from `.ini` files and are not saved to the databases. When changed or if the type is changed, the option will become model specific and be saved to the databases. **MODEL/DRAWING(ROLE)** options are **SYSTEM(ROLE)** options whose type and/or setting has been changed. The change would be used when you want the **SYSTEM(ROLE)** option to be saved with the model to `options_model.db` and `options_drawings.db` under model folder. These settings can be set back to **SYSTEM(ROLE)**, which will then take into use the default value.

See also

[Typical initialization files (.ini files) and their reading order (page 247)](page 247)

Change the advanced option values in the Advanced Options dialog box

Use advanced options to configure Tekla Structures to suit the way you work, or to comply with specific project requirements or industry standards. Change the advanced options only in the **Advanced Options** dialog box. The settings in the **Advanced Options** dialog override the settings in any other initialization file.

1. On the **File** menu, click **Settings** --> **Advanced options** to open the **Advanced Options** dialog box, or press **Ctrl+E**.

2. Browse the categories to find the advanced option you want to set.

   You can also enter a search term in the **Search** box. To search the search term in all categories, select **In all categories**. You can also use wildcards. For example, to find all advanced options that have the words `anchor` and `filter` and that have any characters between these two words, enter `anchor*filter`.

3. Set the advanced option to the desired value by entering the value or by selecting the value from the list.

   - You can change the type of the role-specific advanced options from **SYSTEM (ROLE)** to **MODEL (ROLE)** or **DRAWING(ROLE)** and vice versa from the list next to the option type. When you change the option type to **SYSTEM(ROLE)**, the value automatically changes to the default value. When you enter a value for a **SYSTEM (ROLE)** option, it changes to **MODEL (ROLE)** or **DRAWING(ROLE)**.

- You can change the type of system-specific advanced options from **SYSTEM** to **MODEL(SYSTEM)**, in which case the value is saved in the options database. If you reset the advanced option back to **SYSTEM**, the value will be removed from the options database and the value specified in initialization files will be used.

- You can use switches with some advanced options, for example, to define the contents of marks: `%TPL:PROJECT.NUMBER%`.

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

- If you need to enter a folder path, you can type a backslash at the end of the folder path or leave it out.

4. Click **Apply** or **OK**.

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

See also

Settings defined by advanced options (page 274)

5.4 Input files (.inp files)

Tekla Structures uses input files for various purposes, for example, to manage user-defined attributes and some component dialog boxes, and for defining how components work. All input files have the extension `.inp`.

Input files that you can use for configuring Tekla Structures are listed below.

File	Description
`analysis_design_config.inp`	Contains settings for analysis and design.
`fltprops.inp`	Includes materials and dimensions of available flat bars (page 286).
`mesh_database.inp`	Contains definitions for reinforcement meshes.
`objects.inp`	Used to manage user-defined attributes (page 280).
`objects_rebar_set.inp`	Used to manage user-defined attributes of rebar sets.

File	Description
`pop_mark_parts.inp`	Contains settings for pop-marking.
`privileges.inp`	Used to control access rights.
`profitab.inp`	Contains available parametric profiles (page 155).
`rebar_config.inp`	Contains settings for reinforcement marks.
`rebar_database.inp`	Rebar catalog (page 227). Contains definitions for reinforcing bars and strands.
`rebar_schedule_config.inp`	Contains internal bending types of reinforcing bars and their mapping to area specific bending codes. **Rebar shape manager** is a more versatile way to define reinforcing bar bending shapes.

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

See also

Environment database file (page 282)

Properties of the objects.inp file

Here, we explain the structure of user-defined attribute definitions. For general information on modifying the definitions, such as file locations and reading order, see Define and update user-defined attributes (UDAs) (page 280).

The example below shows the main properties of `objects.inp`.

```
attribute("MY_INFO_1", "My Info 1", string, "%s", no, none, "0.0", "0.0")
{
    value("", 0)
```

Property	In the example	Description
`attribute` or `unique_attribute`	`attribute`	`attribute` is a regular attribute, which is copied with other part properties. `unique_attribute` is a non-copyable attribute. The value of the attribute is never copied to another part. For example part checking status attributes usually cannot be copied.

Property	In the example	Description
attribute_name	`MY_INFO_1`	Attribute name, used to find the attribute value.
		Ensure that Tekla Structures does not already use the attribute name you use. Consider using a prefix that ensures the name is unique, for example, your initials, or an abbreviation of your company name.
		The attribute name is case-sensitive. Do not use spaces or reserved characters in attribute names. The maximum length of the name can be 19 characters.
		To include the attribute in a report or template, add the name of the attribute to your layout in the Template Editor. When you run a report or create a drawing, Tekla Structures displays the current value of the attribute.
label_text	`My Info 1`	Label that Tekla Structures displays in the dialog box.
		Some default attributes have prompts like `j_comment`, meaning that the prompt comes from the `joints.ail` message file.
value_type	`string`	`integer` or `float` for numbers
		`string` for text
		`string_not_modifiable` for text whose modification is

Property	In the example	Description
		prevented. A field with the `string_not_modifiable` property is always displayed as dimmed and it cannot be switched on or off. The value in the field is not saved when clicking the **Apply** button or modified when clicking the **Modify** button.
		`option` for lists
		`date` for date with small calendar
		`date_time_min` for date and time [12:00] with small calendar
		`date_time_sec` for date and time [12:00:00] with small calendar
		If you change the value type of a field that already contains values in the model, make sure that the values are valid for the new data type and verify the results.
field_format	`%s`	Definition of the field format in the dialog box
		• `%s` for strings
		• `%d` for numbers
special_flag	`no`	`no` or `yes`
		For parts: consider in numbering
		For drawings: display the attribute value in **Document manager**
		For other elements: no effect

Property	In the example	Description
check_switch	`none`	`none` This option is not used.
attribute_value_max	`0.0`	`0.0` This option is not used.
attribute_value_min	`0.0`	`0.0` This option is not used.

Define and update user-defined attributes (UDAs)

The property pane and many dialog boxes contain user-defined attributes (UDAs) for various objects, including beams, columns, bolts and drawings. Tekla Structures displays these fields when you click the **More** button in the property pane or the **User-defined attributes** button in a dialog box. For example, comment, locked, and erection status are user-defined attributes.

When you define new user-defined attributes

The user-defined attributes are managed in the objects.inp (page 277) file. To define new user-defined attributes, create your own `objects.inp` file in the model, project or firm folder. After adding your own user-defined attributes, you need to run the **Diagnose and change attribute definitions** command to update the definitions (page 281) in the model.

When you define new user-defined attribute (page 282), make the definition of the user-defined attribute unique. This is because a user-defined attribute cannot have different definitions for different object types, such as beams and columns.

The `object.inp` files are merged so that if there are user-defined attributes in any of the files, they are displayed in the user interface. Tekla Structures merges the files in a way that eliminates duplicate attributes. If Tekla Structures encounters the same attribute name in different `objects.inp` files, the attribute from the first read `objects.inp` file will be used.

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

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

Tekla Structures reads the `objects.inp` files from the following folders in the following order:

1. model folder
2. project folder
3. firm folder
4. system folder
5. `inp` folder

Changing existing user-defined attribute definitions

Updating a user-defined attribute definition in a model does not convert any values that are already stored in the field. If you change the value type of a field that already contains values in the model, make sure that the values are valid for the new data type and verify the results.

The safest approach is to create a new attribute when the format of the values in the field changes. If you want to convert user-defined attribute values, you can create a report that lists the values, convert them using external tools and import the converted values (page 376).

See also

Environment database file (page 282)

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

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

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

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

See also

Define and update user-defined attributes (UDAs) (page 280)

Environment database file (page 282)

Properties of the objects.inp file (page 277)

Example: Create and update a user-defined attribute (UDA) (page 282)

Environment database file

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

When you create a new model, Tekla Structures merges the definitions from your objects.inp (page 277) files to the `environment.db` file. Later, when you add **new** user-defined attributes in the `objects.inp` file, the definitions are saved in `environment.db` as you open the model.

You can modify your user-defined attributes (page 280) in an `objects.inp` file but the **changed** definitions do not come into effect automatically. If there are conflicts, the definitions in `environment.db` win. You need to run the **Diagnose and change attribute definitions** command to see the conflicts between `environment.db` and `objects.inp`, and select the attribute definitions that you want to update.

See also

Update definitions of user-defined attributes (UDAs) in a model (page 281)

Example: Create and update a user-defined attribute (UDA) (page 282)

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

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

Create a user-defined attribute

1. Create a new model and save it.

    The user-defined attributes in the model are merged from objects.inp (page 280) files and Tekla Structures saves the attribute definitions in the environment.db (page 282) file in the model folder.

2. Close the model.

3. Create an input file called `objects.inp` in the model folder by using a standard text editor.

4. Enter the following information in `objects.inp`. For details about the properties in the attribute string, see objects.inp (page 280).

    ```
    /
    *********************************************************
    *****************/

    /* Part attributes */
    /
    *********************************************************
    *****************/
    ```

```
part(0,"Part")

{

/* User defined tab page */

tab_page("My UDA tab")

{

/* User defined attribute */

attribute("MY UDA", "My UDA", string,"%s", no, none,
"0,0", "0,0")

{

value("", 0)

}

}

tab_page("My UDA tab", "My UDA tab", 19)

modify (1)

}

/
******************************************************
****************/

/* Column attributes */

/
******************************************************
****************/

column(0,"j_column")

{

/* Reference to the user defined tab page that is defined
above in */

/* the part() section: */

tab_page("My UDA tab", "My UDA tab", 19)

modify (1)
```

To see the example text file, click objects.inp - example 1.

NOTE If you want to create a user-defined attribute that also affects numbering, set the special_flag (page 277) property of the attribute to `yes` (it is `no` in the example above). Also, just like in the example above, the definition of the `tab_page` must be in the `part` section, and the `column` (`beam`, etc.) section must have only a reference to it.

---

5. Save `objects.inp`.

Test the user-defined attribute

1. Open the model.

2. Create a steel column.

3. Double-click the steel column to open its properties in the property pane.

4. Click the **More** button.

5. Go to **My UDA tab**.

My UDA tab	General Design	Tekla Structural Designer
My UDA	☑	
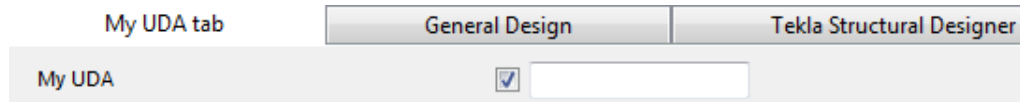
6. Enter a value in the **My UDA** box.

7. Click **Modify**.

8. Copy the steel column.

9. Check the **My UDA** box of the new steel column.

   The attribute value was also copied.

10. Close the model.

Modify the user-defined attribute to make it unique

1. Open the `objects.inp` file in the model folder by using a standard text editor.

2. Enter `unique_` before the user-defined attribute.

```
/
*******************************************************
*****************/

/* User-defined attributes */

/
*******************************************************
*****************/

part(0,"Part")

{

/* Common tab pages for part attributes */

tab_page("My UDA tab")

{

unique_attribute("MY UDA", "My UDA", string,"%s", no,
none, "0,0", "0,0")

{
```

```
value("", 0)

}

}

tab_page("My UDA tab", "My UDA tab", 19)

modify (1)

}

/
********************************************************
*****************/

/* Column attributes */

/
********************************************************
*****************/

column(0,"j_column")

{

tab_page("My UDA tab", "My UDA tab", 19)

modify (1)

}
```

This makes the user-defined attribute unique, meaning that the value of the user-defined attribute will not be copied to another part.

3. Save `objects.inp`.

    To see the example text file, click objects.inp - example 2.

Test the unique user-defined attribute

1. Open the model.

2. Enter a value in the **My UDA** box for a steel column and click **Modify**.

3. Copy the steel column.

4. Check the **My UDA** box of the new column.

5. The value was copied, so the user-defined attribute in the model is not unique. There is a conflict between the `environment.db` and `objects.inp` definitions.

Update the definitions of user-defined attributes

1. On the **File** menu, click **Diagnose & repair** and in the **Utilities** area, click **Diagnose and change attribute definitions**.

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

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

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

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

3. Select the definition in the area on the right.

4. Click **Change current settings to selected Objects.inp settings**.

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

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

See also

Update definitions of user-defined attributes (UDAs) in a model (page 281)

Define and update user-defined attributes (UDAs) (page 280)

Properties of the objects.inp file (page 277)

Show plates as flat bars in drawings and reports

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

1. Set the advanced option XS_USE_FLAT_DESIGNATION to `TRUE`.

2. Indicate the prefix you want to use for flat bars using the advanced option XS_FLAT_PREFIX.

   For example, `XS_FLAT_PREFIX=FLAT`.

3. Set other platework-related advanced options as required.

4. Define materials, thickness, and width of available flat bars in the Fltprops.inp (page 286) file.

TIP • To prevent Tekla Structures from displaying the profile in metric units in the US environment Imperial role, add the flat bar prefix to the profitab.inp (page 170) file as a parametric profile.

• See also page **Platework** in the **Advanced Options** dialog box for information about advanced options related to platework.

Define flat bar sizes with the Fltprops.inp file

Use the `Fltprops.inp` file, located in the `\profil` folder under the environment folder `..\ProgramData\Trimble\TeklaStructures \<version>\environments\`, to define flat bar thickness, width and material. The exact location may vary depending on your environment.

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

The first row in the file contains flat bar material definitions (enclosed in quotes " ") followed by plate thicknesses. If you do not define a material, you can use all materials for all flat bars. The following rows define the widths of available flat bars.

The units are millimeters.

Example

`Fltprops.inp` contains the following data:

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

With the above data, Tekla Structures displays the following plates as flat bars:

Plate	Material
5x40, 5x45, 6x50, 6x55	All materials
8x60, 8x65, 10x70, 10x75	S235
10x100, 10x110, 15x200, 15x220	S275J0

The flat bars get the prefix that is set in the XS_FLAT_PREFIX advanced option.

See also

Show plates as flat bars in drawings and reports (page 286)

Define unfolding parameters in the unfold_corner_ratios.inp file

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

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

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

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

- If the advanced option XS_USE_OLD_POLYBEAM_LENGTH_CALCULATION is set to TRUE.

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

Unfold parameter properties

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

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

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

Property	In the example	Description
		around its longitudinal axis
		For plates: the minimum thickness of plate
Rotation / thickness max	180	For polybeams: the maximum angle when the profile is rotated around its longitudinal axis
		For plates: the maximum thickness of plate
Flag	2	This property defines what kind of parts are affected by the next two properties.
		1 is sharp folds. Only polybeams with straight chamfers are affected.
		2 is curved bends. Only polybeams with curved chamfers are affected.
Angle / radius min	0	For sharp folds: the minimum angle
		For curved bends: the minimum radius
Angle / radius max	1000	For sharp folds: the maximum angle
		For curved bends: the maximum radius
Ratio	.7	Defines how much the profile stretches or shrinks when unfolded.
		Ratio = (1 - the relative location of the neutral axis).
		If only the inner surface of the profile shrinks, the ratio is 1. If only the outer surface of the profile stretches, the ratio is 0. By default, the ratio is 0.5 for length

Property	In the example	Description
		calculation and 0.0 for bending radius calculation. Tekla Structures applies the unfolding ratio if the profile properties are within the range indicated by the minimum and maximum values.

See also

5.5 Data files (.dat files)

Data files contain information used by certain components, or **Rebar shape manager**, for example.

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

File	Description
`joints.dat`	Contains data used in **Handrailing (1024)** and **Stanchions (S76)** components. Used in the **Stanchion connection type** option.
`railings.dat`	Contains data used in **Handrailing (1024)**. Used in the **Stanchion connection type** option.
`steps.dat`	Contains the data for **Stairs (S82)** and **Stairs (S71)**. Used in the **Step profile** and **Catalogue step** options.
`std_flange_plates.dat`	Contains data for **Tapered column (S99)**. Used in the options: • **Outer flange profile** • **Inner flange profile** • **Top plate profile**
`std_stiffener_plates.dat`	Contains data used in **Tapered column (S99)**. Used in the **Horizontal stiffener profile** box.

File	Description
`marketsize.dat`	Contains available market sizes for certain material grade. Can be used with `fMarketSize()` function in the custom component editor.
`import_macro_data_types.dat`	Contains the user-defined attributes that you can include in an input file in attribute import.
`RebarShapeManager.CustomProperties.dat`	Contains the custom properties, template attributes, and user-defined attributes that you can use in bending shape rules in **Rebar shape manager**.

Note that default data files are read from the environment's system folder, but user-defined data files are stored in the model's `\attributes` folder.

See also

5.6 Message files

Tekla Structures uses the information in the message files to display messages in the user interface. Message files include, for example, texts used in dialog boxes.

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

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

The files include texts in languages in which the Tekla Structures user interface is available.

See also

Customize message files

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

1. Do one of the following:

   - To modify an `.ail` message file, go to the `..\Tekla Structures\<version>\messages` folder.

- To modify an `.xml` message file, go to the `..\Tekla Structures \<version>\messages\DotAppsStrings` folder.

2. Open the message file you want to customize using a standard text editor.

3. Modify the message as required.

4. Save the message file.

Example: customize a message file

In this example, you will modify a message that Tekla Structures uses for near side plates in drawings. You want Tekla Structures to display `(NS)` instead of `(N/S)`.

1. Go to the `..\Tekla Structures\<version>\messages` folder.

2. Open `by_number.ail` using a standard text editor.

   The `by_number.ail` file contains both prompts and default texts that Tekla Structures uses in drawings.

3. Browse to the following section:

   ```
   string by_number_msg_no_675

   {

   ...

   entry = ("enu", "(N/S)");

   };
   ```

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

5. Save and close the file.

See also

Message files (page 291)

5.7 Property files

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

By default, Tekla Structures uses the standard (page 293) property files when you apply commands. The default standard property files are read from the environment's system folder.

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

To save a user-defined property file, do the following:

In the property pane	In a dialog box
1. Enter a name for the property file in the box next to the 💾 button.	1. Enter a name for the property file in the box next to the **Save as** button.
2. Click 💾 to save the property file.	2. Click **Save** or **Save as** to save the property file.

Example

Change the standard (page 293) steel column properties so that you create a new type of column that you call `custom1`.

1. Open the steel column properties in the property pane.

2. Enter or modify the properties you want to save.

3. In the box next to the 💾 button, enter a name for the new column properties, for example, `custom1`.

4. Click 💾.

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

See also

Model folder files and file name extensions (page 310)

5.8 Standard files

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

The standard properties are displayed in the property pane of different model objects, such as beams, columns or plates, or in the dialog boxes of, for example, drawing objects.

How to take standard files into use

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

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

- In dialog boxes: the properties are loaded when you select the **standard** option in the list next to the **Load** button, and click the **Load** button.
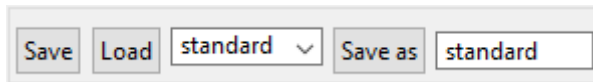
Standard files are named `standard.*` where the symbol * is the file name extension. For example, `standard.clm` file is used for steel column properties. The user-defined attributes are saved with the `standard` files as `*.more`files. For example, `standard.clm.more` file is used for steel column user-defined attributes.

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

Save a set of standard files

If needed, you can save a set of `standard` files in the current model's `\attributes` folder.

You can then copy the `standard` files to the project folder or the firm folder for future use, to set up Tekla Structures to suit the way you work.

1. To save a set of standard files, go to **Quick Launch**.

2. Start typing `save defaults`.

3. Select the **Save defaults** command from the list.

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

File	Property
standard.bpl standard.bpl.more	Bent plate properties
standard.clm standard.clm.more	Steel column properties
standard.cpl standard.cpl.more	Contour plate properties
standard.crs standard.crs.more	Orthogonal beam properties
standard.dia standard.dia.more	Twin profile properties
standard.fms standard.fms.more	Plotting frames
standard.fpl standard.fpl.more	Folded plate properties

File	Property
standard.ipc standard.ipc.more	Concrete item properties
standard.ips standard.ips.more	Item properties
standard.ler standard.ler.more	Layer properties
standard.mvi standard.mvi.more	Model view properties
standard.num standard.num.more	Numbering setup
standard.prf standard.prf.more	Project properties
standard.prt standard.prt.more	Steel beam properties
standard.scr standard.scr.more	Bolt properties
standard.wld standard.wld.more	Weld properties

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

Create user-defined standard files

You can also create your own `standard` files. Tekla Structures saves the user-defined standard files in current model's `\attributes` folder.

1. To save a user-defined `standard` file, open the property pane or a dialog box whose properties you want to save as a `standard` file.

2. Modify or enter the properties.

3. Save the properties.

   • In the property pane: enter `standard` as the name
   , and click .

- In a dialog box: in the box next to the **Save as** button, enter `standard`
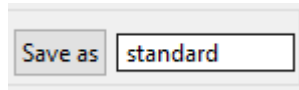
  as the name ![Save as standard] , and click **Save as**.

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

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

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

See also

5.9 Catalog files

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

Each environment has its own folder, where the files related to different catalogs are stored. For example, `..\environments\uk\general\profil\` contains the files for managing catalog files used in the United Kingdom. The exact file location may vary depending on the folder structure of your environment files.

The following table lists files and file types related to catalogs.

File type	File name	Used for	Located in
`.inp`	`profitab.inp`	Defines the names that you can use for parametric profiles.	In the `\profil` folder, under the environment folders, in `..\ProgramData \Trimble\Tekla Structures \<version> \environments \<environment>\`
	`rebar_database.inp`	The rebar catalog.	In the `\profil` folder, under the environment folders,

File type	File name	Used for	Located in
			in `..\ProgramData` `\Trimble\Tekla` `Structures` `\<version>` `\environments` `\<environment>\`
	`mesh_database` `.inp`	The reinforcement mesh catalog.	In the `\profil` folder, under the environment folders, in `..\ProgramData` `\Trimble\Tekla` `Structures` `\<version>` `\environments` `\<environment>\`
	You can define the file name while exporting.	Created when you export rebar catalogs.	You can define the folder where to export the files.
`.cnv`	`matexp_<softw` `are>.cnv`	Contains information to convert material names when transferring model information using links. For example, converts S235JR to FE360B for DSTV.	In the `\profil` folder, under the environment folders, in `..\ProgramData` `\Trimble\Tekla` `Structures` `\<version>` `\environments` `\<environment>\`
	`prfexp_<softw` `are>.cnv`	Contains information to convert profile names when transferring model information using links. For example, converts HEA100 to HE100A for DSTV.	In the `\profil` folder, under the environment folders, in `..\ProgramData` `\Trimble\Tekla` `Structures` `\<version>` `\environments` `\<environment>\`
`.clb`	For example, `RU_CF.clb`	Contains the definitions of parametric profiles used in `profitab.inp`.	`..\ProgramData` `\Trimble\Tekla` `Structures` `\<version>` `\environments` `\common\inp`

File type	File name	Used for	Located in
`.lis`	You can define the file name while exporting.	Created when you export bolt, profile and material catalogs.	You can define the folder where to export the files.
`.db`	`assdb.db`	The bolt assembly catalog.	In the `\profil` folder, under the environment folders, in `..\ProgramData \Trimble\Tekla Structures \<version> \environments \<environment>\`
	`screwdb.db`	The bolt catalog.	In the `\profil` folder, under the environment folders, in `..\ProgramData \Trimble\Tekla Structures \<version> \environments \<environment>\`
`.bin`	`profdb.bin`	The profile catalog.	In the `\profil` folder, under the environment folders, in `..\ProgramData \Trimble\Tekla Structures \<version> \environments \<environment>\`
	`matdb.bin`	The material catalog.	In the `\profil` folder, under the environment folders, in `..\ProgramData \Trimble\Tekla Structures \<version> \environments \<environment>\`

See also

Customize the profile catalog (page 139)

Customize the material catalog (page 131)

5.10 Font files and font conversion files

You can define the location of font files with the advanced option `DXK_FONTPATH` in the `teklastructures.ini` or your environment initialization file. For example, you can use fonts available in the folder `..\ProgramData\Trimble\Tekla Structures\<version>\environments\common\fonts`.

This folder includes the following fonts:

Font	Font type
`fixfont.fon`	Tekla Structures system font
`romco.fon`	Tekla Structures system font
`romsim.fon`	Tekla Structures system font
`romsim8.fon`	Tekla Structures system font

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

File	Description
`template_fonts.cnv`	Used for converting Tekla Structures system fonts (Template Editor fonts) to Windows fonts in DWG/DXF export.
`dxf_fonts.cnv`	Used for converting True Type fonts to SHX fonts (font format understood by AutoCAD) in DWG/DXF export.

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

See also

5.11 Symbol files

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

You can create symbols with Symbol Editor. In this case, the file name extension is `.sym`. You can also use symbols of `.dwg` format.

Tekla Structures symbol files are by default located in the folder `..\environments\common\symbols`.

5.12 Files related to templates, reports and drawings

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

File or file type	Description	Location
`.rpt`	Report templates (page 339) created with the Template Editor	System folders defined for the advanced option `XS_SYSTEM`
`.tpl`	Drawing templates (page 339) created with the Template Editor	Template folders defined for the advanced option `XS_TEMPLATE_DIRECTORY`
`.lay`	Layout definitions created with the **Drawings & reports** --> **Drawing properties** --> **Drawing layout** command.	The `\attributes` sub-folder in the model folder
`plotdev.bin`	Printer device definitions created with the **Printer Catalog** printer instances.	System folders defined for the advanced option `XS_SYSTEM`
`xdproc`	**Master Drawing Catalog** rule set	System folders defined for the advanced option `XS_SYSTEM`
`xdproc.master`	**Master Drawing Catalog** master drawing file	System folders defined for the advanced option `XS_SYSTEM`
`xdproc.master.png`	**Master Drawing Catalog** sample (preview) image files	System folders defined for the advanced option `XS_SYSTEM`
`xdproc.png`	**Master Drawing Catalog** thumbnail image files	System folders defined for the advanced option `XS_SYSTEM`

For more information about the folder search order, see Folder search order (page 334).

Note that default drawing, report, and template files are read from the system folders defined with `XS_SYSTEM` (or from the `XS_TEMPLATE_DIRECTORY` folders), but user-defined files are stored in the model's `\attributes` folder.

5.13 Image files

Tekla Structures uses image files in several places:

- In templates in drawings
- In drawing snapshots
- In component dialog boxes and thumbnails
- In drawing line types
- In the surface treatment dialog box
- In the **Master Drawing Catalog** for thumbnails and sample images
- In profile properties dialog boxes

The following image file formats are supported in Tekla Structures:

- In templates: `bmp`, `gif`, `grd`, `jpg`, `ppm`, `pgm`, `rle`, `tiff` and `xkrl`
- In drawing snapshots, and int thumbnail and sample images for the **Master Drawing Catalog**: `png`
- Other situations: `bmp`

See also

Add images in a template (page 354)

5.14 Log files

Tekla Structures writes information to log files when you, for example, number a model or save a model.

File	Description
`analysis.log`	Tekla Structures stores information in this file when you run the analysis. The file also contains information on the errors that occurred during load distribution. This log file is saved in the current model folder.

File	Description
`check_database.log`	Tekla Structures stores information in this file when you run the **Repair** command in **File menu** --> **Diagnose & repair** --> **Model** . This log file is saved in the current model folder.
`ClashCheck.log`	Contains clashes found in the most recent clash check. This log file is saved in the current model folder.
`ClientLog_cat.txt` `ClientLog_dog.txt`	The client log files contain diagnostic information and error messages regarding the Tekla Model Sharing sharing service, such as connecting to the sharing service or the status of the sharing service. The client log files are saved in the `\Users\<user> \AppData\Local\Tekla DataSharing` folder. The client log contains two log files with the maximum size of 1 megabyte, so that the information will not use too much disk space. When the maximum file size is reached in the `ClientLog_cat.txt` file, log writing is switched to the `ClientLog_dog.txt` file, and the other way around. Each time the client log file is switched, any information previously saved in the current log file is cleared before any new log information is written into the log file.
`ComponentCatalog_<user>.log`	Contains troubleshooting information related to the **Applications & components** catalog and any errors that have occurred in the **Applications & components** catalog. For example, errors in the catalog definition files are stored in the `ComponentCatalog_<user>.log` file. This log file is saved in the `\logs` folder under the current model folder. Note that a limited number of older log messages (approximately 1024KB) related to the **Applications &**

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

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

File	Description
`TeklaStructures_<user>.log`	Contains information on the entire Tekla Structures session from opening the model to closing it. The file contains, for example, errors and information on which catalogs were used. This temporary log file is saved in the `\TeklaStructuresModels` folder, and it is removed when you close Tekla Structures.
`wizard.log`	Tekla Structures stores information in this file when you run a drawing rule set (wizard) file. The file contains, for example, errors and number of drawings created. This log file is saved in the current model folder.

See also

View a log file

The parts that are listed in a log file can be viewed in the model.

1. Open the model whose log history you want view.

2. On the **File** menu, click **Logs** and select a log file you want to see.

   - **Clash Check history log** (`ClashCheck.log`)

   - **Session history log** (`TeklaStructures_<user>.log`)

   - **Numbering history log** (`numberinghistory.txt`)

   - **Saving history log** (`save_history.log`)

   - **Drawing history log** (`drawing_history.log`)

   - **Analysis history log** (`analysis.log`)

3. In the log file, select a row which contains a part or an assembly.

   Parts and assemblies have the prefix `guid`.

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

4. If you want to view the log files in a viewer that has been associated with the file type, for example, in Microsoft Notepad, on the **File** menu click **Logs** and select **View with the default application**.

See also

Change the name and location of session history log file

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

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

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

1. Open a suitable initialization file (page 247) for editing.

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

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

    `set XS_LOG_FILE_NAME=<name of the file>`

    For example:

    `set XS_LOG_FILE_NAME=sessionhistory`

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

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

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

    `set XS_LOGPATH=<location of the file>`

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

4. Save the initialization file.

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

Numbering history log file

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

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

Example

Below is an example of the contents of a `numberinghistory.txt` log file.

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

1	User name, date and time of the numbering.
2	Numbering method. • `Modified numbering` is displayed when you run the **Number modified objects** command. • `Modified numbering for selected series` is displayed when you run the **Number series of selected objects** command. • `Diagnose & Repair Numbering: All` is displayed when you run the **Diagnose & repair numbering: All** command. • `Diagnose & Repair Numbering: Series of selected objects` is displayed when you run the **Diagnose & repair numbering: Series of selected objects** command. • `Renumber all` is displayed when you select the **Renumber all** option in the **Numbering Setup** dialog box.

3	Some **Compare** options set in the **Numbering Setup** dialog box are displayed in the `numbering.history` log file only if they are set differently than the default value: • `Compare modified to old parts` • `Compare new to old part` • `No holes comparing` • `No part name comparing` • `Beam orientation` • `Column orientation` Some **Compare** options are not displayed at all: • **Reinforcing bars** • **Embedded objects** • **Surface treatment**
4	Numbering options. • `Use old numbers` is displayed only when you have selected the **Re-use old numbers** option in the **Numbering Setup** dialog box. • `Check for standard parts` is displayed only when you have selected the **Check for standard parts** option in the **Numbering Setup** dialog box.
5	Tolerances are set in the **Numbering Setup** dialog box.
6	Changes in the position numbers and in the numbering series during one numbering session.
	In addition: If a numbering series overlaps another, the errors are written to the log file.

See also

Numbering series in the numbering history log file

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

Example 1

The `numberinghistory.txt` log after one concrete beam **B/20** has been created and numbered:
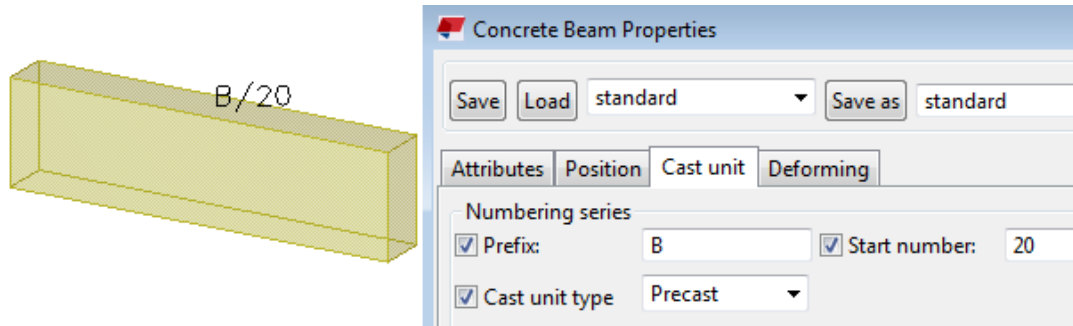
```
1  Part      guid: ID510F595D-0000-0030-3133-353939383335  series:Concrete_B-20/1  Concrete_B-20/0 -> Concrete_B-20/1
2  Assembly guid: ID510F595D-0000-002F-3133-353939383335  series:B/20  B/0 -> B/20
```

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

Example 2

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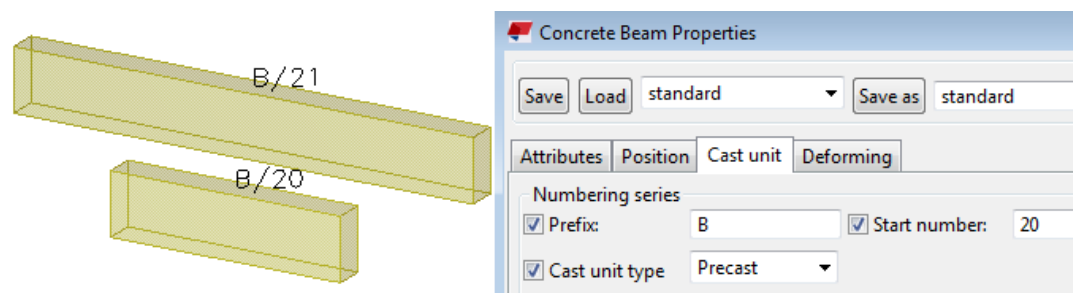

```
1  Part      guid: ID510F595D-0000-0030-3133-353939383335  series:Concrete_B-20/1  Concrete_B-20/0 -> Concrete_B-20/2
2  Assembly guid: ID510F595D-0000-002F-3133-353939383335  series:B/20  B/0 -> B/21
```

1	Part position number of the new part.
	• The part with the ID `ID510F595D-0000-0030-3133-353939383335` is part of the numbering series `Concrete_B-20/1`.
	• The part becomes the second part in the numbering series: `Concrete_B-20/0 -> Concrete_B-20/2`.
2	Assembly position number.
	• The assembly ID of the part is `ID510F595D-0000-002F-3133-353939383335`.
	• The part belongs to the `B/20` assembly numbering series, which is also the cast unit numbering series.
	• The part gets the assembly position number: `B/20 B/0 -> B/21`.

See also

5.15 Model folder files and file name extensions

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

Files in the Tekla Structures model folder

File or file name extension	Description
`.db1`	Model database
`.db2`	Numbering database
`environment.db`	Database for user-defined attribute definitions
`xslib.db1`	Contains information on user-defined connections and details, and default component descriptions.
`.idrm`	Mapping file, which handles IDs. Do not modify.
`xslib.db2`	Contains numbering information.
`options_model.db` and `options_drawings.db`	Contain values for model-specific options from the **Options** dialog box and values for model-specific advanced options from the **Advanced**

File or file name extension	Description
	Options dialog box. When a model is created, Tekla Structures reads model-specific options and advanced options values from the `standard.opt` file and `.ini` files in the environment folders and saves them in these two databases.
`history.db`	Model history database.
`xsdb.xs`	File used for displaying the name of the model in the **Open** dialog box.
`xs_user.<username>`	Contains interface settings specified by the user.
	Each time a model is saved, an `xs_user.<username>` file is created or updated. These settings are user specific. If the `xs_user.<username>` file is not found in the model folder when you open the model, Tekla Structures searches for the `xs_user.default` file in the following folder search order: model, `model\attributes`, project, XS_FIRM `\attributes`, system. If this file is not found, Tekla Structures default settings will be used.
	This file contains settings for many of the options in the **Options** dialog box and the settings for the icons on the **Selecting** and **Snapping** toolbars.
`save_history.log`	Tekla Structures stores the information in this file each time the model is saved. The file includes the saving time, date and information on any conflicts during saving.
`notification_report.xsr`	File used for displaying a notification report of assignments when you open a model.
`TeklaStructuresModel.xml`	Contains information on the Tekla Structures session, for example on opening, closing and what catalogs are being used.
`dotlog.txt`	A log file that contains information on Tekla Open API application use.

File or file name extension	Description
`.locked`	A temporary file that locks the model folder files to prevent modifications while the model is in use.
`.bak`	A backup copy of the model database.
`assert.txt`	A log file that contains information on assertion errors.
`ClashCheck.txt`	A log file that contains information on clashes found in the most recent clash check and the date and time of the clash check.
`ClashCheck.history`	A file that contains information on all clashes found in all clash checks and the dates and times of the clash checks.
`wizard.txt`	Tekla Structures stores information in this file when you run a drawing rule set (wizard) file. The file contains, for example, errors, number of drawings created, and information on which commands were used.
`.lis`	Different catalogs can be exported from and imported to different Tekla Structures models as `.lis` files. These include profile, material and bolt catalogs.
`.tsc`	Shapes can be exported from and imported to different Tekla Structures models as `.tsc` files.
`.This_is_multiuser_model`	Contains information about the PC running the Tekla Structures multi-user server. Do not alter or delete this file in normal circumstances. If you move a model to a different server, you should delete this file. Tekla Structures generates a new file with the same name.
`ComponentCatalog.xml`	Contains the model level catalog definitions of the **Applications & components** catalog.
`<user>_ComponentCatalogUserSettings.xml`	Lists the recently used applications and components, and their location in the **Applications & components** catalog structure.

File or file name extension	Description
`Worktypes.xml`	Lists available task types. Created when you start **Task Manager**.
`WorkTypeProperties.xml`	Lists allowed property types and their units.
`.tmp`	A file used to store temporary data.
`.cnv`	A file used to map Tekla Structures profile and material names with names used in other software.
`.colorset`	Created when you export a color set from **Organizer**.

Files in the \Analysis folder

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

Files in the \attributes folder

File or file name extension	Description
`.rop`	Reference object properties
`.rop.more`	Reference object user-defined attribute properties
`.m10000017`	FabTrol XML import properties
`.m10000015`	Import attribute properties
`.ncf`	NC file properties
`.ExportIFC.MainDialog`	IFC export properties
`.m440000004`	3D DWG/DXF export properties
`.m440000003`	3D DGN export properties
`.m1000004`	FEM export properties
`.m10000011`	CIS analysis model export properties

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

File or file name extension	Description
	Component front view: component_front_view
	Component top view: component_top_view
	Component end view: component_end_view
	Component perspective view: component_persp_view
	Custom component front view: custom_object_editor_front_view
	Custom component top view: custom_object_editor_top_view
	Custom component end view: custom_object_editor_end_view
	Custom component perspective view: custom_object_editor_perspective_view
	3D assembly or cast unit view: assembly_basic_view
	Assembly or cast unit front view: assembly_front_view
	Assembly or cast unit top view: assembly_top_view
	Assembly or cast unit end view: assembly_end_view
	Assembly or cast unit back view: assembly_back_view
	Assembly or cast unit bottom view: assembly_bottom_view
	Assembly or cast unit perspective view: assembly_persp_view
`.gvi`	Saved properties for creating views along grid lines
`.rep`	Object representation properties
`.clm`	Steel column properties
`.clm.more`	Steel column user-defined attribute properties
`.prt`	Steel beam properties

File or file name extension	Description
`.prt.more`	Steel beam user-defined attribute properties
`.sb`	Steel spiral beam properties
`.sb.more`	Steel spiral beam user-defined attribute properties
`.crs`	Orthogonal beam properties
`.crs.more`	Orthogonal beam user-defined attribute properties
`.dia`	Twin profile properties
`.dia.more`	Twin profile user-defined attribute properties
`.cpl`	Contour plate properties
`.cpl.more`	Contour plate user-defined attribute properties
`.blp`	Bent plate properties
`.blp.more`	Bent plate user-defined attribute properties
`.lpl`	Lofted plate properties
`.lpl.more`	Lofted plate user-defined attribute properties
`.ips`	Item properties
`.ips.more`	Item user-defined attribute properties
`.cpf`	Pad footing properties
`.cpf.more`	Pad footing user-defined attribute properties
`.csf`	Strip footing properties
`.csf.more`	Strip footing user-defined attribute properties
`.ccl`	Concrete column properties
`.ccl.more`	Concrete column user-defined attribute properties
`.cbm`	Concrete beam or concrete polybeam properties
`.cbm.more`	Concrete beam or concrete polybeam user-defined attribute properties
`.csb`	Concrete spiral beam properties
`.csb.more`	Concrete spiral beam user-defined attribute properties
`.csl`	Concrete slab properties

File or file name extension	Description
.csl.more	Concrete slab user-defined attribute properties
.cpn	Concrete panel properties
.cpn.more	Concrete panel user-defined attribute properties
.lsl	Concrete lofted slab properties
.lsl	Concrete lofted slab user-defined attribute properties
.ipc	Concrete item properties
.ipc.more	Concrete item user-defined attribute properties
.rbr	Reinforcing bar properties
.rbr.more	Reinforcing bar user-defined attribute properties
.rbg	Reinforcing bar group properties
.rbg.more	Reinforcing bar group user-defined attribute properties
.rcu	Curved reinforcing bar group properties
.rci	Circular reinforcing bar group properties
.rbm	Reinforcement mesh properties
.rbm.more	Reinforcement mesh user-defined attribute properties
.rbs	Reinforcement strand pattern properties
.rbs.more	Reinforcement strand pattern user-defined attribute properties
.rsp	Reinforcement splice properties
.rsp.more	Reinforcement splice user-defined attribute properties
.rst	Rebar set properties
.rst.more	Rebar set user-defined attribute properties
.rst.zones	Rebar set spacing zone properties
.rst_pm	Rebar set property modifier properties
.rst_pm.more	Rebar set property modifier user-defined attribute properties

File or file name extension	Description
`.rst_edm`	Rebar set end detail modifier properties
`.rst_edm.more`	Rebar set end detail modifier user-defined attribute properties
`.rst_sm`	Rebar set splitter properties
`.admodel`	Analysis model properties
`.admodel.more`	Analysis model user-defined attribute properties
`.lm1`	Point load properties
`.lm2`	Line load properties
`.lm3`	Area load properties
`.lm4`	Uniform load properties
`.m10000028`	Wind load properties
`.lm6`	Temperature load properties
`.lco`	Load combination properties
`.adnode`	Analysis node properties
`.adnode.more`	Analysis node user-defined attribute properties
`.prt_ad`, `.prt_design`	File types associated with steel beam analysis property settings. `.prt_ad` contains information associated with the analysis part properties and `.prt_design` contains information associated with the actual steel beam design.
`.crs_ad`, `.crs_design`	File types associated with orthogonal steel beam analysis property settings. `.crs_ad` contains information associated with the analysis part properties and `.crs_design` contains information associated with orthogonal steel beam design.
`.clm_ad`, `.clm_design`	File types associated with steel column analysis property settings. `.clm_ad` contains information associated with the analysis part properties and `.clm_design` contains information associated with the actual steel column design.

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

File or file name extension	Description
	information associated with the actual concrete beam design.
`.csl_ad`, `.csl_design`	File types associated with concrete slab analysis property settings. `.csl_ad` contains information associated with the analysis part properties and `.csl_design` contains information associated with the actual slab design.
`.cpn_ad`, `.cpn_design`	File types associated with concrete panel analysis property settings. `.cpl_ad` contains information associated with the analysis part properties and `.cpl_design` contains information associated with the actual concrete panel design.
`.srf`	Surface treatment properties
`.srf.more`	User-defined surface treatment attribute properties
`.srfo`	Surface properties
`.srfo.more`	User-defined surface attribute properties
`.cha`	Edge chamfer properties
`.cha.more`	User-defined edge chamfer attribute properties
`.scr`	Bolt properties
`.scr.more`	User-defined bolt attribute properties
`.wld`	Weld properties
`.wld.more`	User-defined weld attribute properties
`*.udwcs`	User-defined weld cross sections (UserDefinedWeldCrossSections.udwcs)
`.m1000009`	Control number properties
`.m1000010`	Control number locking properties
`.num`	Numbering setup properties
`.rpr`	Report properties
`.4d`	Project status visualization properties

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

Component properties files in the \attributes folder

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

Object level drawing settings, saved in \attributes folder

File or file name extension	Description
.dprt	Object level part properties
.dim	Object level dimension properties
.pm	Object level part mark properties
.jm	Object level connection mark properties
.sm	Object level bolt mark properties
.rm	Object level reinforcement mark properties
.mrms	Object level merged reinforcement mark properties
.pom	Pour object mark properties
.surfm	Object level surface treatment mark properties
.note	Object level associative note properties
.wls	Object level weld mark properties
.lev	Object level level mark properties
.rev	Object level revision mark properties
.drmsh	Object level reinforcement mesh properties

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

View level drawing settings, saved in \attributes folder

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

File or file name extension	Description
`.vpom`	View level pour object mark properties
`.vp`	View level part properties
`.vs`	View level bolt properties
`.vnp`	View level neighbor part properties
`.vsurf`	View level surface treatment properties
`.vw`	View level welding properties
`.vr`	View level reinforcement properties
`.vnr`	View level neighbor reinforcement properties
`.vrmp`	View level reference object properties
`.vpo`	View level pour object properties
`.vg`	View level grid properties
`.vf`	View level filter properties
`.vnf`	View level neighbor part filter properties

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

File or file name extension	Description
`.wd` `.wd.copt`	Single-part drawing properties
`.wd.more`	Single-part drawing user-defined attributes
`.wdf`	Single-part drawing filter properties
`.wdnf`	Single-part drawing neighbor part filter properties
`.wdl`	Single-part drawing layout properties
`.wdl.more`	Single-part drawing user-defined layout attributes
`.wdv`	Single-part drawing view properties
`.wdv.more`	Single-part drawing user-defined view attributes
`.wdc`	Single-part drawing section view properties

File or file name extension	Description
`.wdc.more`	Single-part drawing user-defined section view attributes
`.wdd`	Single-part drawing dimension properties
`.wdd.more`	Single-part drawing user-defined dimension attributes
`.wdcd`	Single-part drawing dimensioning properties
`.wdcd more`	Single-part drawing user-defined dimensioning attributes
`.wpm`	Single-part drawing part mark properties
`.wsm`	Single-part drawing bolt mark properties
`.wnpm`	Single-part drawing neighbor part mark properties
`.wdsurfm`	Single-part drawing surface treatment mark properties
`.wdsurfm.more`	Single-part drawing user-defined surface treatment mark attributes
`.wjm`	Single-part drawing connection mark properties
`.wdp`	Single-part drawing part properties
`.wds`	Single-part drawing bolt properties
`.wds.more`	Single-part drawing user-defined bolt attributes
`.wdnp`	Single-part drawing neighbor part properties
`.wdnp.more`	Single-part drawing user-defined neighbor part attributes
`.wdsrf`	Single-part drawing surface treatment properties
`.wdsrf.more`	Single-part drawing user-defined surface treatment attributes
`.wdgr`	Single-part drawing grid properties
`.wdgr.more`	Single-part drawing user-defined grid attributes
`.wdr`	Single-part drawing protection properties
`.wdr.more`	Single-part drawing user-defined protection attributes

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

File or file name extension	Description
`.ad`	Assembly drawing properties
`.ad.more`	Assembly drawing user-defined attributes
`.adf`	Assembly drawing filter properties
`.adnf`	Assembly drawing neighbor part filter properties
`.adl`	Assembly drawing layout properties
`.adl.more`	Assembly drawing user-defined layout attributes
`.adv`	Assembly drawing view properties
`.adc`	Assembly drawing section view properties
`.add`	Assembly drawing dimension properties
`.add.more`	Assembly drawing user-defined dimension attributes
`.adcd`	Assembly drawing dimensioning properties
`.adcd.more`	Assembly drawing user-defined dimensioning attributes
`.apm`	Assembly drawing part mark properties
`.asm`	Assembly drawing bolt mark properties
`.anpm`	Assembly drawing neighbor part mark properties
`.adsurfm`	Assembly drawing surface treatment mark properties
`.adsurfm.more`	Assembly drawing user-defined surface treatment mark attributes
`.ajm`	Assembly drawing connection mark properties
`.adp`	Assembly drawing part properties
`.adp.more`	Assembly drawing user-defined part attributes
`.ads`	Assembly drawing bolt properties

File or file name extension	Description
.adnp	Assembly drawing neighbor part properties
.adnp.more	Assembly drawing user-defined neighbor part attributes
.adsrf	Assembly drawing surface treatment properties
.adsrf.more	Assembly drawing user-defined surface treatment attributes
.adw	Assembly drawing welding properties
.adw.more	Assembly drawing user-defined welding attributes
.adgr	Assembly drawing grid properties
.adgr.more	Assembly drawing user-defined grid attributes
.adr	Assembly drawing protection properties

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

File or file name extension	Description
.cud .cud.copt	Cast unit drawing properties
.cud.more	Cast unit drawing user-defined attributes
.cudl	Cast unit drawing layout properties
.cudl.more	Cast unit drawing user-defined layout attributes
.cudv	Cast unit drawing view properties
.cudv.more	Cast unit drawing user-defined view attributes
.cudc	Cast unit drawing section view properties
.cudc.more	Cast unit drawing user-defined section view attributes
.cudd	Cast unit drawing dimension properties
.cudd.more	Cast unit drawing user-defined dimension attributes

File or file name extension	Description
`.cudcd`	Cast unit drawing dimensioning properties
`.cudcd.more`	Cast unit drawing user-defined dimensioning properties
`.cupm`	Cast unit drawing part mark properties
`.cusm`	Cast unit drawing bolt mark properties
`.cunpm`	Cast unit drawing neighbor part mark properties
`.cudsurfm`	Cast unit drawing surface treatment mark properties
`.cudsurfm.more`	Cast unit drawing user-defined surface treatment mark attributes
`.cudrm`	Cast unit drawing reinforcement mark properties
`.cudrm.more`	Cast unit drawing user-defined reinforcement mark attributes
`.cudp`	Cast unit drawing part properties
`.cudp.more`	Cast unit drawing user-defined part attributes
`.cuds`	Cast unit drawing bolt properties
`.cuds.more`	Cast unit drawing user-defined bolt attributes
`.cudnp`	Cast unit drawing neighbor part properties
`.cudnp.more`	Cast unit drawing user-defined neighbor part attributes
`.cudsrf`	Cast unit drawing surface treatment properties
`.cudsrf.more`	Cast unit drawing user-defined surface treatment attributes
`.cudr`	Cast unit drawing reinforcement properties
`.cudr.more`	Cast unit drawing user-defined reinforcement attributes
`.cudw`	Cast unit drawing welding properties
`.cudw.more`	Cast unit drawing user-defined welding attributes
`.cudgr`	Cast unit drawing grid properties

File or file name extension	Description
`.cudgr.more`	Cast unit drawing user-defined grid attributes
`.cudrp`	Cast unit drawing protection properties
`.cudrp.more`	Cast unit drawing user-defined protection attributes
`.cuf`	Cast unit drawing filter properties
`.cunf`	Cast unit drawing neighbor part filter properties

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

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

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

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

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

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

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

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

Files related to IFC export in \IFC folder

File or file name extension	Description
`.ifc`	Exported IFC files

Files related to NC in the \DSTV_Profiles folder

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

Files in the \ModelSharing folder

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

Files in the \ProjectOrganizer folder

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

Files related to reports in the \Reports folder

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

Files in the \SessionFileRepository folder

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

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

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

Files in the \screenshots folder

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

Files related to Unitechnik export in the \UT_files folder

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

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

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

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

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

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

2. Click the arrow next to **Applications** to open the applications list.

3. Double-click **Directory browser**.

    The **Directory browser** dialog box opens. You can check the most common folder paths, and customize the settings in your `user.ini` file, or in the user-specific or model-specific `options.ini` file.

4. Check the folder paths and change them if necessary by clicking the buttons on the left of the **Basic** tab.

    If you click the **Project** or **Firm** button and you have not set your firm and project folder, Tekla Structures will prompt you to do so and add the folder path definition to your `user.ini` file.

5. Check the settings in the `user.ini` and `options.ini` files and change them if necessary by clicking the buttons on the right of the **Basic** tab.

6. Go to the **Advanced** tab and define the folder paths for additional folders that you may need to access, such as custom components and macros.

5.17 Folder search order

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

It is important that you keep files in correct folders. Once Tekla Structures finds the associated files, it stops searching. This means that files that have the same name but are located lower down the search order are ignored.

The folder search order is:

Folder	Defined by
Current model	The open model
Project	Advanced option XS_PROJECT. If property files are stored in user-defined sub-folders under the project folder, Tekla Structures searches the sub-folders for files in alphabetical order. The first associated file is selected. After that, each file with the same file name suffix and file name prefix as the selected file is ignored. The names of the ignored files are stored in the error log.
Firm	Advanced option XS_FIRM. If property files are stored in user-defined sub-folders under the firm folder, Tekla Structures searches the sub-folders in alphabetical order. The first associated file is selected. After that, each file with the same file name suffix and file name prefix as the selected file is ignored. The names of the ignored files are stored in the error log.
System	Advanced option XS_SYSTEM

Tekla Structures does not search for certain files in exactly this order. The exceptions are listed below.

The exceptions are:

File (type)	Search order
objects.inp (page 280)	- Model folder - Project folder (XS_PROJECT) - Firm folder (XS_FIRM) - System folder (XS_SYSTEM) - inp folder (XS_INP)
privileges.inp	- Model folder - Project folder (XS_PROJECT) - Firm folder (XS_FIRM) - System folder (XS_SYSTEM) - inp folder (XS_INP)

File (type)	Search order
.dat files (page 290)	System folder (`XS_SYSTEM`)
Templates (page 339)	• Folder containing your templates indicated by the advanced option XS_TEMPLATE_DIRECTORY • Model folder • Project folder (`XS_PROJECT`) • Firm folder (`XS_FIRM`) • Environment-specific system templates indicated by the advanced option XS_TEMPLATE_DIRECTORY_SYSTEM • System folder (`XS_SYSTEM`)
Catalogs	Profile (page 139), bolt (page 210), material (page 131), and rebar (page 227) catalogs: • Model folder • Project folder (`XS_PROJECT`) • Firm folder (`XS_FIRM`) • Folder indicated by the advanced option XS_PROFDB Shape catalog (page 202): • Model folder • Project folder (`XS_PROJECT`) • Firm folder (`XS_FIRM`) • System folder (`XS_SYSTEM`) • Folder indicated by the advanced option XS_DEFAULT_BREP_PATH Printer catalog: • Model folder • Project folder (`XS_PROJECT`) • Firm folder (`XS_FIRM`) • Folder indicated by the advanced option XS_DRIVER

WARNING	Do not store customized files in the system folder. That way, you will avoid having problems or doing a lot of unnecessary work when you upgrade to a newer version of the software.

5.18 Location of certain hidden files and folders

When Tekla Structures is installed in the `..\Program Files` folder, some of the files needed to run Tekla Structures are located in hidden folders and are therefore invisible. You can see the hidden files and folders if you make them visible in the Windows **Folder Options**.

NOTE	You can always check the settings below. If you run into problems with the settings, ask your administrator or local support for assistance.

Files related to the software

Software and, for example, the following files are installed under the `..\Program Files\Tekla Structures\<version>\` folder.

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

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

Files related to environments

Environments and, for example, the following files are installed under the `..\ProgramData\Trimble\Tekla Structures\<version>\environments\<environment>\` folder. The exact file location may vary depending on the folder structure of your environment files.

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

- `TilePatternCatalog.xml`

Files related to user settings

User settings and, for example, the following files are installed under the `..\Users\<username>\AppData\Local\Trimble\Tekla Structures \<version>\` folder.

- `user.ini`
- `options.bin`
- customized property pane layout `PropertyTemplates.xml` file
- customized ribbon and customized tab `.xml` files
- customized contextual toolbar `.xml` files
- customized toolbar `.json` files

See also

Model folder files and file name extensions (page 310)

6 Templates

Templates are descriptions of forms and tables that can be included in Tekla Structures. Templates are either graphical or textual. Graphical templates are inserted in drawing layouts as tables, text blocks, and drawing headers, for example. Textual templates are used for creating reports. The contents of the template fields are filled in by Tekla Structures at run time.

Tekla Structures includes a large number of standard templates you can use. Use Template Editor to modify existing templates, or create new ones to suit your needs. Graphical template definitions have the file name extension `.tpl`. Textual template definitions have the file name extension `.rpt`.

The ready-made textual and graphical templates are located under the environment folders, in `...\ProgramData\Trimble\Tekla Structures \<version>\environments\`. The exact file location may vary depending on the folder structure of your environment files. Text and graphical report templates, except mark templates, can also be read from any subdirectory of `XS_FIRM` or `XS_PROJECT` directories.

Examples

Example of a title block:

Example of an inquiry report:

```
Inquire Object                                                        ─ □ ✕

GUID: ID552CB981-0002-39A4-3134-323839393435   Type: 2   Assembly phase: 1   Part phase: 1

┌──────────────────────────────────────────────────────────────────────────┐
│ ┌─────────────────────────────────────────────────────────────────────── │ ▲
│   Name    Profile          Material       Grids    Part        Assembly    │
│                                                     position    position    │
│ ──────────────────────────────────────────────────────────────────────── │
│   BEAM    IPE200           S235JRG2       A-B/5>      M/0(?)      B/569(?)   │
│ ──────────────────────────────────────────────────────────────────────── │
│   Total 881 Parts: 52.74 T, 2465.62 m                                     │
│ ======================================================================== │
│                                                                            │
│   Part                    GUID: ID552CB981-0002-39A4-3134-323839393435     │
│   -----------------                                                        │
│   Global coordinates:                                                      │
│    Start point             :  X= 4210.2 mm      Y= 27447.0 mm    Z= 35775.0 mm │
│    End point               :  X= 6980.1 mm      Y= 27847.3 mm    Z= 35775.0 mm │
│    Center of gravity       :  X= 5595.2 mm      Y= 27647.2 mm    Z= 35675.0 mm │
│    Top level               :  +35.775                                      │
│    Bottom level            :  +35.575                                      │
│   -----------------                                                        │
│   Local coordinates, UCS:                                                  │
│    Start point             :  X= 4210.2 mm      Y= 27447.0 mm    Z= 35775.0 mm │
│    End point               :  X= 6980.1 mm      Y= 27847.3 mm    Z= 35775.0 mm │
│    Top level               :  +35.775                                      │
│    Bottom level            :  +35.575                                      │
│   -----------------                                                        │
│    Part position           :  M/0(?)                                       │
│    Assembly position       :  B/569(?)                                     │
│    Net length              :  2798.7 mm                                    │
│    Gross length            :  2798.7 mm                                    │
│    Weight                  :  62.61 kg                                     │
│    Weight(Net)             :  59.86 kg                                     │
│    Weight(Gross)           :  62.61 kg                                     │
│    Volume                  :  0.008 m³                                     │
│    Area                    :  22130.33 cm²                                 │
│    Name                    :  BEAM                                         │
│    Material                :  S235JRG2                                     │ ▼

  OK
```

Example of a part list report:

```
Report

  ----------------------------------------------------------------------
  TEKLA STRUCTURES PARTS LIST FOR CONTRACT NO:   1        Page: 1
   CONTRACT:   Trimble Solutions Co                       Date: 28.10.2016
  ----------------------------------------------------------------------
  PartPos     Profile     No.   Material     Length   Area(m2)   Weight(kg)
  ----------------------------------------------------------------------
  1001        PL10*230     2    S235JR          270      0.1          4.9
  1002        PL20*140    10    S235JR          352      0.1          7.6
  b/1         HEA300       1    S235JR         5590      9.6        493.7
  c/1         HEA400       2    S235JR         7200     13.8        898.7
  ----------------------------------------------------------------------
                          Total for  15   members:      38.6       2376.7
  ----------------------------------------------------------------------
```

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

See also

6.1 Create a template

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

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

3. Select the template type and click **OK**. A new empty template is created.

4. Add new rows in the template.

    a. Click **Insert** --> **Component** --> **Row** to add a new row.

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

    c. Repeat steps a–b for each new row.

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

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

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

       The **Select Attribute** dialog box appears prompting you to select an attribute for the value field.

    c. Select an attribute and click **OK**.

    d. Repeat steps a–c for each value field.

6. Save the template.

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

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

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

    d. Click **OK**.

See also

6.2 Create a template in HTML format

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

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

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

3. Select **Graphical template** and click **OK**.

4. Add new rows in the template.

   a. Click **Insert** --> **Component** --> **Row** to add a new row.

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

   c. Repeat steps a–b for each new row.

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

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

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

      The **Select Attribute** dialog box appears prompting you to select an attribute for the value field.

   c. Select an attribute and click **OK**.

   d. Repeat steps a–c for each value field.

6. Add a header for each value field.

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

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

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

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

   e. Repeat steps a–d to create headings for all the value fields.

7. Save the template:

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

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

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

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

   d. Click **OK**.

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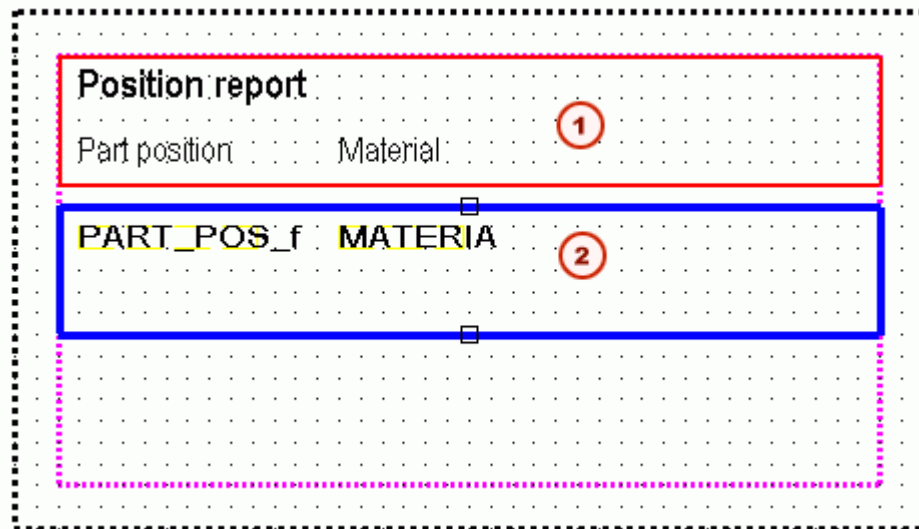
1. Header that contains text fields
2. Row that contains two value fields

See also

6.3 Create a .pdf report template

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

1. On the **File** menu, select **Editors** --> **Template editor**.

2. Select **File** --> **New** --> **Graphical template**.

3. Click **Edit** --> **Properties**.

4. In **Template page properties** dialog box, set the page size to match the target page size (for example A4):

The size must match a size defined in the PaperSizesForDrawings.dat configuration file.

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

5. Add new rows and value fields to get the required data from your Tekla Structures database. For more information about adding new rows and value fields, see Create a template (page 341).

6. Click **File** --> **Save as**, and save the report with the filename extension `.pdf.rpt`.

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

    Now you can create a `.pdf` report using the new `.pdf` report template. For more information about creating a report, see .

Example .pdf report

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

Template Page Properties

Output
Width: 180 mm
Height: 255 mm

Workarea
View height: 127 mm

Margins
Top: 10 mm
Bottom: 10 mm
Left: 10 mm
Right: 0 mm
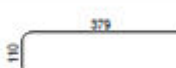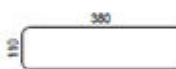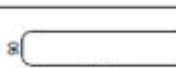
Information
Version: 3.21 | Created: 3.5.2004 13:23 | Free attributes...
Modified: 11.3.2016 15:36

Notes: Converted template

[OK] [Cancel]

Below is an example of a report that has been created using this particular report template. To open the report in a browser, click here.

REBAR BENDING SCHEDULE

Project: **Rebar fabrication 1**

Pos	Diameter	Number	Grade	Length	Kg/p	Weight	Bending shape	Belongs to
WR/1	10	16	Undefined	800	0.49	7.9	800	W/4
WR/3	16	8	Undefined	7130	11.25	90.0	7130	
WR/4	12	8	Undefined	3490	3.10	24.8	3492	
WR/6	16	4	Undefined	7690	12.14	48.5	7690	
WR/7	12	4	Undefined	4090	3.63	14.5	4092	
WR/11	10	8	Undefined	950	0.59	4.7	950	W/3
WR/12	10	12	Undefined	2080	1.28	15.4	2089	
WR/13	10	12	Undefined	2880	1.78	21.3	2889	
WR/2	8	42	Undefined	830	0.33	13.8	379 / 110	W/3
WR/2	8	96	Undefined	830	0.33	31.5	379 / 110	W/4
WR/5	12	24	Undefined	980	0.87	20.9	507 / 507	
WR/8	6	14	Undefined	830	0.18	2.6	380 / 110	W/3
WR/9	6	22	Undefined	810	0.18	4.0	80 / 380	W/3
WR/10	8	78	Undefined	810	0.32	25.0	80 / 379	W/3
WR/10	8	184	Undefined	810	0.32	58.9	80 / 379	W/4
	Total:	532.0			Total:	383.7		

6.4 Create a template for nested assemblies

This example shows how to produce a template that displays the hierarchical structure of nested assemblies. You will create a nested assembly structure in a textual template similar to the one in the following picture:
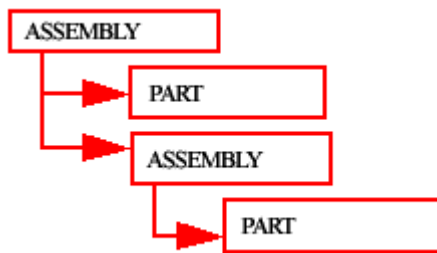
1. On the **File** menu, click **Editors** --> **Template Editor**.
2. In Template Editor, click **File** > **New**.
3. Select **Textual template** and click **OK**.
4. Add four new rows in the template.

   a. Click **Insert** --> **Component** --> **Row** to add a new row.

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

   For the first and third row, select the **ASSEMBLY** content type, and for the second and fourth row, select the **PART** content type.

   c. Repeat steps a–b for each new row.

5. Use the arrow buttons under **Sorting and drawing order** to create a nested assembly structure for the template.

   a. Move the second and third row down one level.

   b. Move the fourth row down two levels.
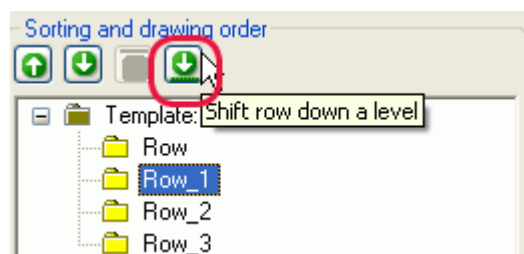
   The structure should now look like this:
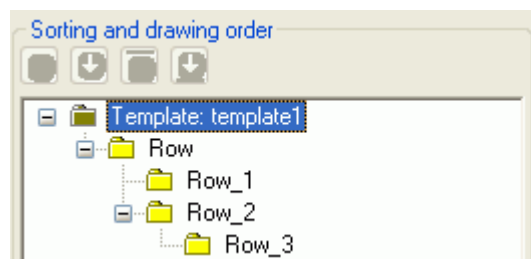
6. Add value fields to get the required data from your Tekla Structures database.

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

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

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

      The **Select Attribute** dialog box appears prompting you to select an attribute for the value field.

   c. Select an attribute and click **OK**.

   d. Repeat steps a–c for each value field.

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

   a. Move objects to display the nested assembly structure in the printed report. To do this, select the object you want to move and drag it to the desired position.

   b. Align objects. To do this, select all the objects you want to align, right-click and select the appropriate option from the pop-up menu, for example **Align** --> **Right** .

   c. Add a header and a footer. To do this, click **Insert** --> **Component** --> **Page header** and **Page footer**. Add the required information to the header and footer.

8. Save the template.

Example

Below is an example textual template and a report that has been created using the template:

ASSEMBLY STRUCTURE

AssemblyRo	NUMBE	WEIGHT1
PartRow1	NUMBE	WEIGHT2
SubAssembl	NUMBE	WEIGHT3
PartRow2	NUMBE	WEIGHT4

TOTAL WEIGHT   TotalWeight
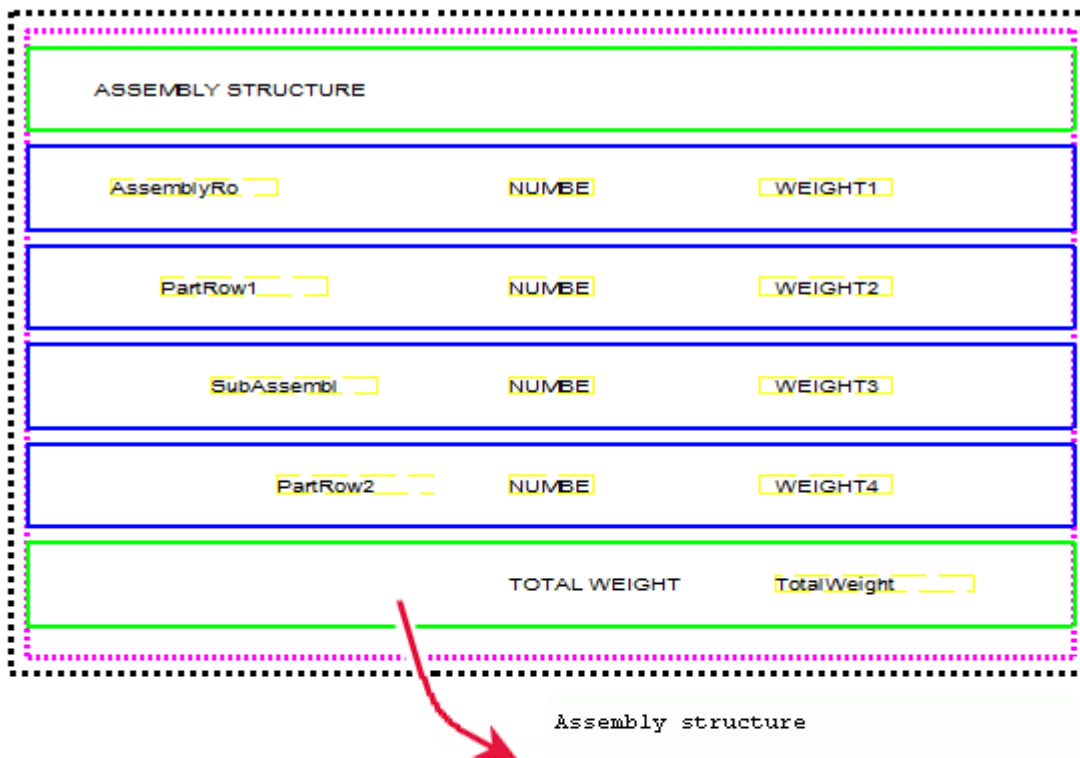
```
Assembly structure


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

            Total weight            677.5
```

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

See also

Templates (page 339)

6.5 Create a template for bending schedules or pull-out pictures

You can use Template Editor for creating bending schedules or pull-outs pictures on reinforcement bars and bent meshes, and control the type of information that is shown in the bending schedules.

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

2. Click **File** --> **New** .

3. Select **Graphical template** and click **OK**.

4. Click **Insert** --> **Component** --> **Row** to add a new row.

5. Select **REBAR** or **MESH** as the content type for the row.

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

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

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

   The **Select Attribute** dialog box appears prompting you to select an attribute for the value field.

   c. Select an attribute and click **OK**.

   d. Repeat steps a–c for each value field.

7. Insert a graphical field to your **REBAR** or **MESH** content type row.

   a. Click **Insert** --> **Graphical Field...**

   b. Click and drag with the mouse to draw a frame.

8. Double-click the graphical field to open the **Graphical Field Properties** dialog box.

9. Click **Free attributes** and go to the **User** tab.

10. Add the required bending diagram attributes.

    For a list of attributes and values that can be used for bending schedules in templates, see Bending schedule attributes (page 352).

11. Save the template.

Example

Rebar list		Project number Project name	1 Trimble				Date: 04.05.2016
Position	Size	Quantity	Grade	Length (mm)	Weight (kg)	Weight/Tot	Pull-out picture
1	12	1	A500HW	2310.0	2.1	2.1	
3	12	1	A500HW	1030.0	0.9	0.9	
4	12	1	A500HW	1150.0	1.0	1.0	
7	12	1	A500HW	2540.0	2.3	2.3	
8	12	1	A500HW	1570.0	1.4	1.4	
9	12	1	A500HW	1700.0	1.5	1.5	

Autoscaling pull-out pictures

There is a free attribute available for the PULLOUT attribute in graphical templates that you can use to define the scale type. If you set the free attribute ScaleType to 1 on the **User** tab in the **Free attributes** dialog box, the pull-out pictures will be scaled to fit the available space in both X and Y dimensions. As a result, the shape becomes out of proportion, but small segments can be seen more easily.
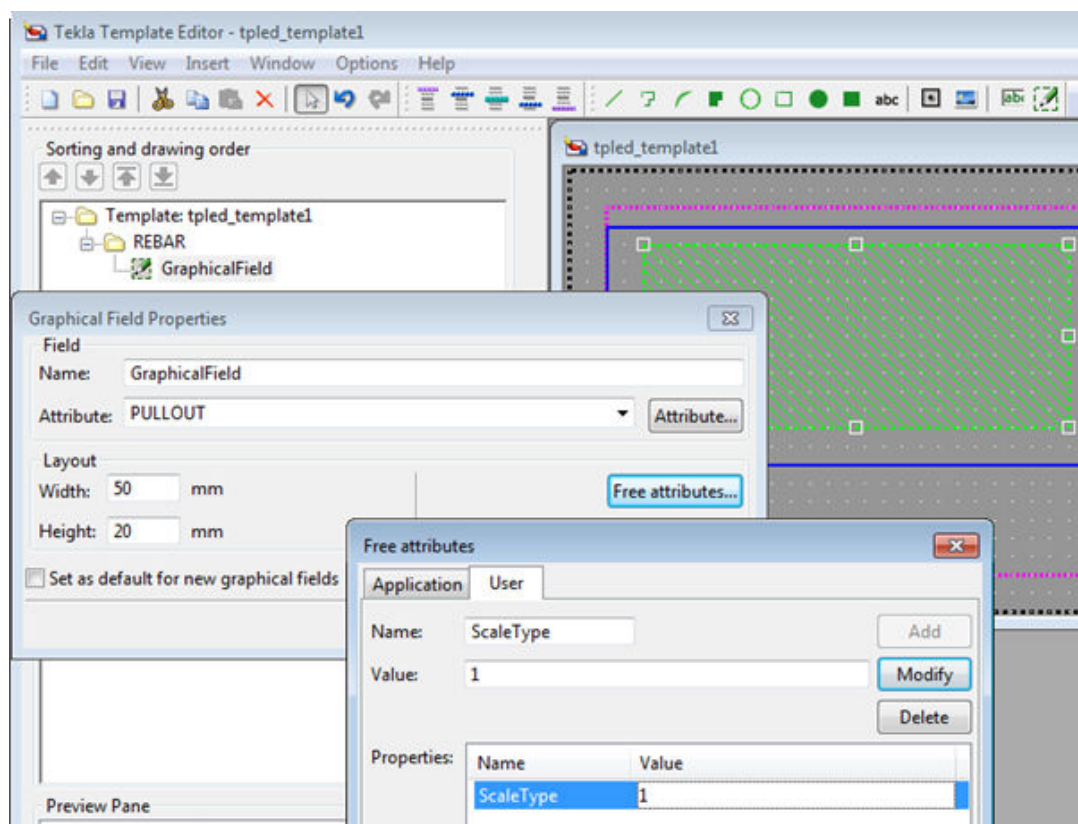
A bending shape may look like this if you do not define the free attribute `ScaleType`:
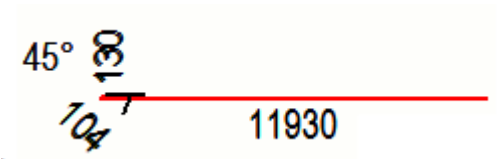
The same bending shape that uses the free attribute `ScaleType` with value `1`.
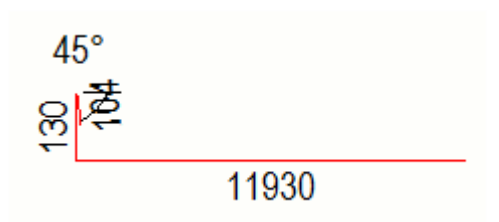
Change the appearance of the pull-out pictures

Tekla Structures uses the settings in the `rebar_config.inp` file in the system folder defined by the advanced option `XS_SYSTEM` to define the appearance of the pull-out pictures. You can change the colors, lines, and dimension unit, format, and precision used in pull-out pictures, for example. For a list of settings and values in `rebar_config.inp`, see Reinforcement settings for drawings (rebar_config.inp)

Bending schedule attributes

The following table lists the attributes and values that can be used for bending schedules in templates.

Attribute	Default value	Available values
FontName	romsim	Available template fonts
FontSize	2.0	Available font sizes
FontColor	1 (black)	1 = black
		2 = red
		3 = bright green
		4 = blue
		5 = cyan
		6 = yellow
		7 = magenta
		8 = brown
		9 = green

Attribute	Default value	Available values
		10 = dark blue
		11 = forest green
		12 = orange
		13 = gray
RotationAxis	2	0 = by view
		1 = by global Z
		2 = by local axis
ScaleType	0	0 = no
		1 = yes
		If you set the free attribute ScaleType to 1 for the PULLOUT attribute, the pull-out pictures will be scaled to fit the available space in both X and Y dimensions. As a result, the shape becomes out of proportion, but small segments can be seen more easily.
Exaggeration	1	0 = no
		1 = yes
EndMark	1	1 = straight
		2 = half arrow
		3 = full arrow
Dimensions	1	0 = no
		1 = yes
BendingRadius	0	Shows the bending radius in form of diameter of the bending roll.
		0 = no
		1 = yes
BendingAngle	1	0 = no
		1 = yes

Attribute	Default value	Available values
ImageWidth	Width of the graphical field multiplied by 4.	Number of pixels
ImageHeight	Height of the graphical field multiplied by 4.	Number of pixels

See also

Create a template for bending schedules or pull-out pictures (page 350)

6.6 Add images in a template

You can add images in graphical templates. For example, you might want to include a company logo in your drawings. Tekla Structures supports the following image formats in graphical templates: `.bmp`, `.jpg`, `.jpeg`, `.tif`, `.tiff` and `.png`.

1. Open an existing graphical template or create a new graphical template in Template Editor.

2. Add a new row in the template:

    a. Click **Insert** --> **Component** --> **Row** to add a new row.

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

3. Ensure that you have the row selected, and click **Insert** > **Picture** to open the **Select Picture File** dialog box.

    If a local symbols folder exists, the contents of that folder are shown by default. You can browse for the contents of the `common\symbols` folder by selecting that folder. If a local symbols folder does not exist, Tekla Structures displays the contents of the `common\symbols` folder.

4. If you have images in other folders, you can display these folders in the **Select Picture File** dialog box:

    a. In Template Editor, click **Options** --> **Preferences**.

    b. Go to the **File Locations** tab and on the **Symbols, pictures** row, add a new folder separated by a semicolon (;), for example:

    The folder you defined is displayed in the **Directory** list:
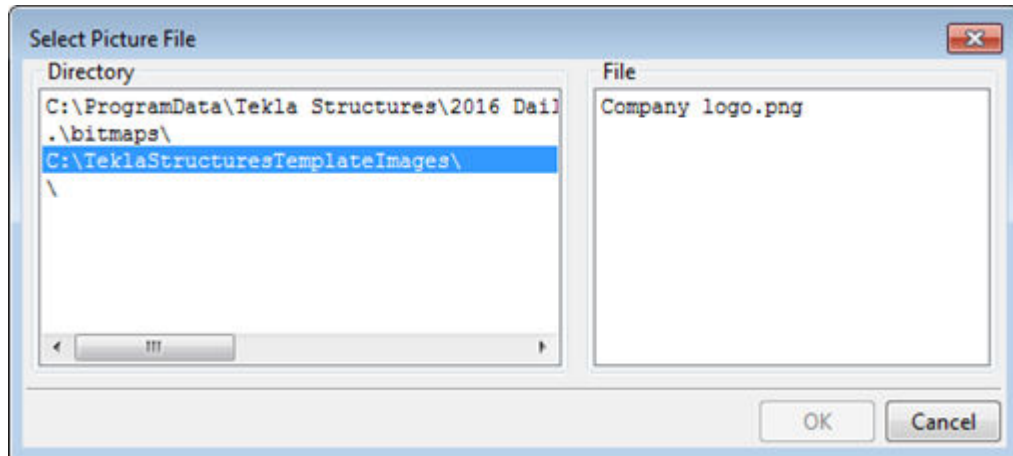
5. Select an image from the **File** list and click **OK** and add the image.

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

Things to remember when adding images in templates

- Do not add very large images because they update very slowly.

- The image may look different in the image editor and in the printout or in the exported DWG file.

- When you export the drawing to DWG, Tekla Structures copies the images in the same folder as the DWG file. If the image for some reason is not in the same folder, only the name of the image is displayed together with an empty frame instead of the image in the DWG.

- If environments have local symbols, the local symbol folder is also included in the search path with the `common\symbols` folder. If the local symbols folder contains files with the same name as `common\symbols` folder, then the local symbol file is used.

- When you open the drawing that contains images inserted in the template, Tekla Structures first looks for the images in the model folder and then in the `\symbols` folder in the current environment.

- You can define a folder where Tekla Structures always looks for images using the advanced option `DXK_SYMBOLPATH`. You can also define a firm folder for your images.

Example

Below are some examples of the **Select Picture File** dialog box showing folder structure in different environments.
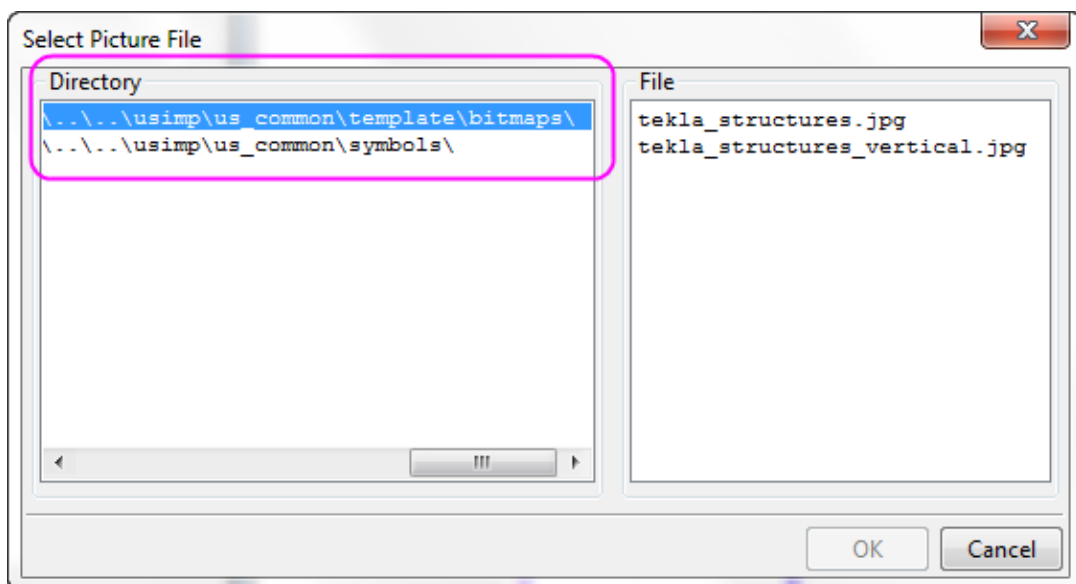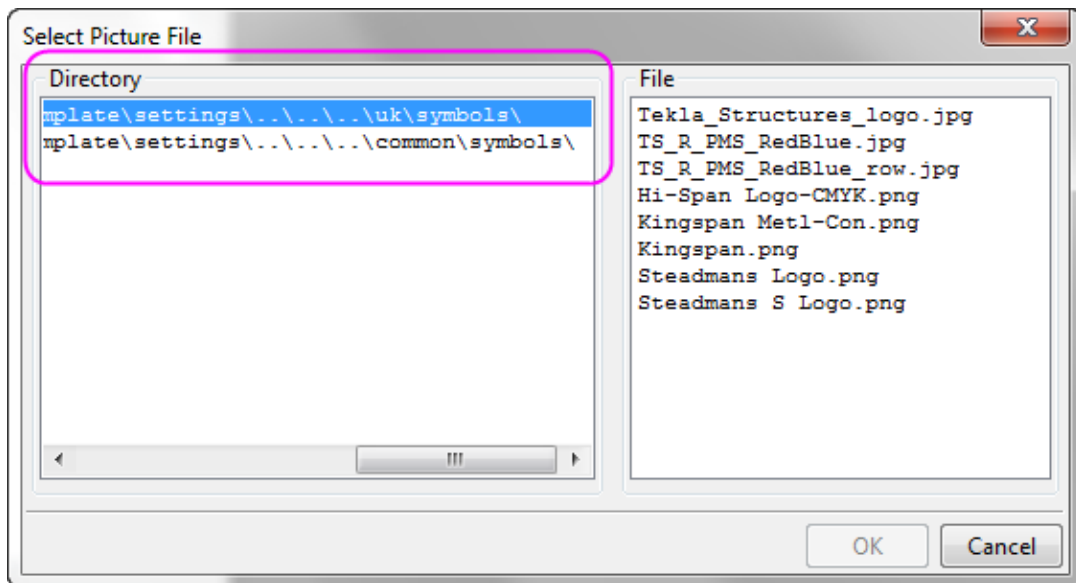
In the following example, a company logo has been added in a template.

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

See also
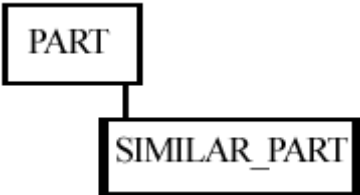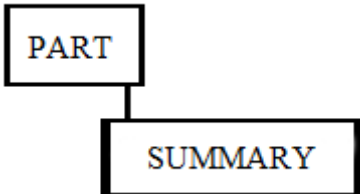
6.7 Content types

When you create a new row in the template, you must select a content type for the row. For example, when you add a row and then add a value field, Template Editor is asking for the content type. The content type determines which template attributes you can use on that row.

The available content types are:

Content type	Description
ANALYSIS_RIGID_LINK	Use to create lists of analysis rigid links.
ANTIMATERIAL	Use to create lists of holes and recesses, or parts removed as a result of a cut.
	In Template Editor, the same attributes that are available for PART are available for ANTIMATERIAL. However, only the attributes that are useful to be used with ANTIMATERIAL are shown, including NAME, LENGTH, WIDTH, HEIGHT, AREA, PROFILE, and NUMBER, and user-defined attributes.
ASSEMBLY	Use to create lists of assemblies and single parts. Includes all assemblies containing the selected parts and bolts.
BOLT	Use to create screw and bolt lists. Includes all bolts connected to selected parts.
CAST_UNIT	Use to create lists of cast units.
CHAMFER	Use to create lists of the length of the chamfers.
COMMENT	Use to create empty rows or rows that only have textual data or lines anywhere on a template.
CONNECTION	Use to create lists of connections.
DRAWING	Use to create drawing lists without revision history information. Use for reports and included drawings.
HIERARCHIC_CAST_UNIT	Use to create reports listing subassemblies of concrete.
HIERARCHIC_OBJECT	Use to create lists of various types of hierarchies. For example, lists hierarchical objects in Organizer.

Content type	Description
HISTORY	Use to retrieve history information of the model. You can use this content type with PART, REBAR, CONNECTION and DRAWING rows.
	The following template attributes can be used with this content type:
	• TYPE: the type of the historical action, for example update or numbering.
	• USER: the user who made the change.
	• TIME: the time the change was made.
	• COMMENT: the comment which was entered upon clicking **Save**.
	• REVISION_CODE: the revision code which was entered upon clicking **Save**.
HOLE	Use to create lists of holes.
LOAD	Use to create lists of loads.
LOADGROUP	Use to create lists of load groups.
MESH	Use to create lists of meshes.
NUT	Use to create lists of nuts. Contains all nuts for bolts associated with the selected parts.
PART	Use to create lists of parts.
POUR_BREAK	Use to create lists of pour breaks.
POUR_OBJECT	Use to create lists of pour objects.
POUR_UNIT	Use to create lists of pour units.
REBAR	Use to create lists of reinforcing bars.
REFERENCE_MODEL	Use to list the reference models.
REFERENCE_OBJECT	Use to list the reference model objects in a reference model.
	Only reference model objects that have user-defined attributes are displayed in reports.
REFERENCE_ASSEMBLY	Use to list the reference assemblies in a reference model.
REVISION	Use to create lists of revision marks.
SIMILAR_ASSEMBLY	Use to create lists of similar parts.
SIMILAR_CAST_UNIT	To use this content type, you need to have an empty (hidden in output) ASSEMBLY, PART or CAST_UNIT row in the row hierarchy above the row with SIMILAR_* content type:
SIMILAR_PART	

Content type	Description
	You cannot have any rows below `SIMILAR_*` row content type in the row hierarchy. **Note:** Used in drawings to collect similar object information from the model. All the other attribute information is collected from visible drawing objects.
`SINGLE_REBAR`	Use to create lists of individual bars in reinforcing bar groups. For example, use it to get the lengths of the individual bars in tapered reinforcing bar groups. For rebar sets, `SINGLE_REBAR` works in the same way as `REBAR`.
`SINGLE_STRAND`	Use to create lists of individual prestressed strands.
`STRAND`	Use to create lists of prestressed strands.
`STUD`	Use to create lists of studs.
`SURFACE`	Use to create lists of surfaces.
`SURFACING`	Use to create lists of surface treatments.
`SUMMARY`	Use to summarize the contents of the row(s) that are above `SUMMARY` in the hierarchy. For example, use `PART` - `SUMMARY` hierarchy to summarize the contents of the `PART` rows.
`TASK`	Use to create lists of tasks.
`WASHER`	Use to create lists of washers. Contains all washers for all bolts associated with the selected parts.
`WELD`	Use to create lists of welds.

6.8 Template attribute files (contentattributes.lst)

Template attributes represent object properties. You can use template attributes in value fields, formulas, and row rules to get the required data from your Tekla Structures database.

When you output the template, Tekla Structures replaces the attribute with the actual value of the corresponding object property. For example, if you include the attribute `WEIGHT` in a report template, Tekla Structures displays the weight of the model object in the report.

Template attributes are defined in the following files:

File name	Description
`contentattributes.lst`	This is a container file listing all the files that contain the actual attribute definitions. The files are added with `INCLUDE` sentences. The order of the files included in `contentattributes.lst` defines the reading order of the files.
	This file is overwritten in the installation when you install a newer version of Tekla Structures. Ensure that you make a copy of this file before updating.
	Generally, there is no need to modify `contentattributes.lst.` Do not modify it if you are not an administrator.
`contentattributes_global.lst`	This file contains attributes that are hard-coded into the program. **Do not edit this file.**
`contentattributes_userdefined .lst`	This file contains user-defined attributes, the same as in the `objects.inp` file.
	This file is overwritten in the installation when you install a newer version of Tekla Structures. To use your own attributes in templates and reports, create a copy of this file and

File name	Description
	add the necessary attributes to that file.

By default, these files are located in `..\Program Files\Tekla Structures\<version>\nt\bin\TplEd\settings`, but the location may be different in your environment.

The search order for the `contentattributes.lst` file is the following:

1. Model folder
2. Project folder defined by XS_PROJECT
3. Firm folder defined by XS_FIRM
4. Folder defined by XS_TPLED_INI
5. Folder defined by XS_TEMPLATE_DIRECTORY/`settings`

See also

User-defined template attributes (page 361)

Location of certain hidden files and folders (page 337)

6.9 User-defined template attributes

User-defined template attributes are defined in the `contentattributes_userdefined.lst` file. By default, this file includes most of the user-defined attributes that are visible in the part properties dialog boxes. To use your own attributes in templates and reports, you should make a copy of the file, rename it appropriately, and add the necessary attributes to that file.

The `contentattributes_userdefined.lst` file is divided into two sections:

- A list of attribute names and default settings:

```
..
// Name                    Datatype   Justify  Cacheable  Length
// XXXXX                   FLOAT      RIGHT    TRUE       8
// ------------------------------------------------------------------
axial1                     FLOAT      RIGHT    TRUE       8
axial2                     FLOAT      RIGHT    TRUE       8
BOLT_COMMENT               CHARACTER  LEFT     TRUE       64
BOLT_USERFIELD_1           CHARACTER  LEFT     TRUE       64
BOLT_USERFIELD_2           CHARACTER  LEFT     TRUE       64
BOLT_USERFIELD_3           CHARACTER  LEFT     TRUE       64
BOLT_USERFIELD_4           CHARACTER  LEFT     TRUE       64
BOLT_USERFIELD_5           CHARACTER  LEFT     TRUE       64
BOLT_USERFIELD_6           CHARACTER  LEFT     TRUE       64
BOLT_USERFIELD_7           CHARACTER  LEFT     TRUE       64
BOLT_USERFIELD_8           CHARACTER  LEFT     TRUE       64
cambering                  CHARACTER  LEFT     TRUE       64
CHECKED_BY                 CHARACTER  LEFT     TRUE       20
CHECKED_DATE               CHARACTER  LEFT     TRUE       20
comment                    CHARACTER  LEFT     TRUE       30
CONN_CODE_END1             CHARACTER  LEFT     TRUE       10
CONN_CODE_END2             CHARACTER  LEFT     TRUE       10
DRAWING_USERFIELD_1        CHARACTER  LEFT     TRUE       64
DRAWING_USERFIELD_2        CHARACTER  LEFT     TRUE       64
DRAWING_USERFIELD_3        CHARACTER  LEFT     TRUE       64
DRAWING_USERFIELD_4        CHARACTER  LEFT     TRUE       64
```

- A list of attributes assigned to content types:

1. The content type of the row in Template Editor

2. The attribute hierarchy in Template Editor

3. Customizable comments, such as the tab name in the user-defined attributes dialog box

4. The name of the user-defined attribute, must be the same as in the `objects.inp` file

See also

Add user-defined template attributes to Template Editor (page 363)

Add user-defined template attributes to Template Editor

This example shows how to add your own user-defined attributes to the attribute tree in Template Editor.

Before you start, add your user-defined attribute to the `objects.inp` file. For example, you might add an attribute named `MY_ATTRIBUTE` to the user-defined properties of drawings.

```
Tekla Structures  Assembly drawing (1)                    [x]
 Workflow | Parameters
 Comment                         ☑ [            ]
 My attribute                    ☑ [            ]
 User field 2                    ☑ [            ]
 User field 3                    ☑ [            ]
```
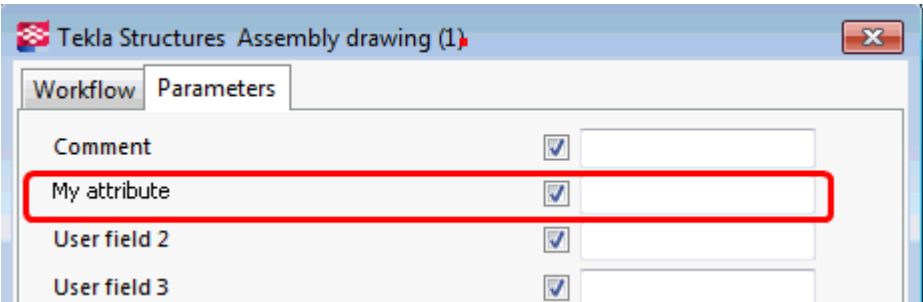
1. Open the `contentattributes_userdefined.lst` file in a text editor.

2. Save the file with an appropriate name, for example `MY_contentattributes_userdefined.lst`, in the same folder.

3. Add `MY_ATTRIBUTE` to the list of attribute names and, define the settings as follows:

```
MORTAR_WIDTH                    FLOAT       RIGHT    TRUE
MY_ATTRIBUTE                    CHARACTER   LEFT     TRUE
OBJECT_LOCKED                   CHARACTER   LEFT     TRUE
```

4. Add `MY_ATTRIBUTE` to the list of attributes assigned to content types.

   Select the content type according to which object the attribute is associated to in the `objects.inp` file. In this example, the content type is `DRAWING`. Add the attribute in the format `USERDEFINED.<ATTRIBUTE_NAME>`.

```
// ========================================
//    Drawing attributes
//    ------------------
//    tab_page("DR_Parameters")
// ========================================

DRAWING            =           USERDEFINED.MY_ATTRIBUTE
```

5. Save the changes.

6. Open the `contentattributes.lst` file.

7. Add the following line in the file:

    `[INCLUDE MY_contentattributes_userdefined.lst]`

8. Save the changes.

    The attribute is shown in the attribute tree in Template Editor, under `DRAWING > USERDEFINED`:
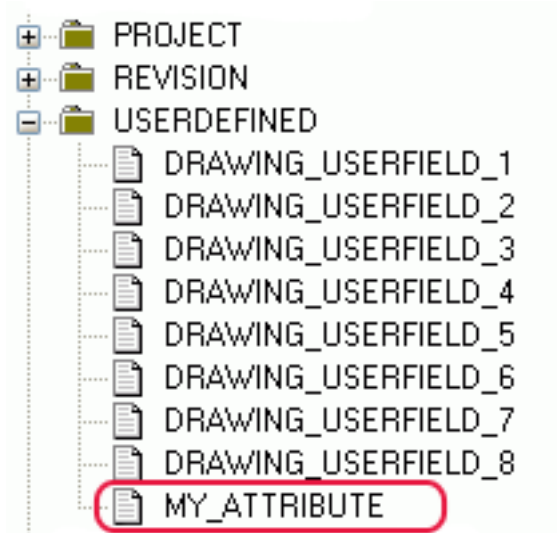
See also

Add comments to user-defined template attributes

You can add your own comments to the user-defined attibutes in the Template Editor attribute tree.

1. Open your copy of the `contentattributes_userdefined.lst` file.

    For example, `MY_contentattributes_userdefined.lst`. Do not modify the original `contentattributes_userdefined.lst` file.

2. Scroll down to the list of attributes assigned to content types.

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

    For example:

4. Save the changes.

The comment you added is displayed in the attribute tree in Template Editor:
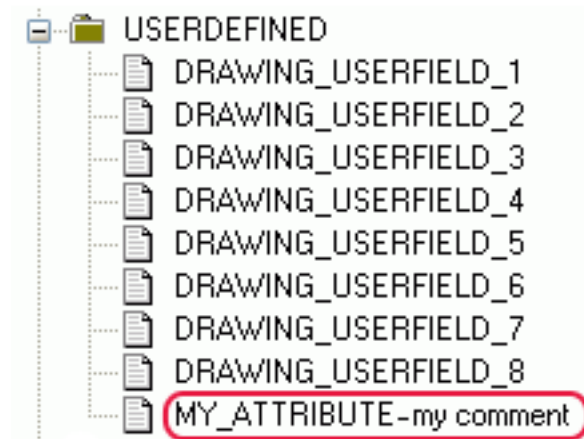
See also

Add hierarchy to user-defined template attributes

You can add your own hierarchy to the Template Editor attribute tree.

1. Open your copy of the `contentattributes_userdefined.lst` file.

   For example, `MY_contentattributes_userdefined.lst`. Do not modify the original `contentattributes_userdefined.lst` file.

2. Scroll down to the list of attributes assigned to content types.

3. Define the hierarchy in square brackets, between `USERDEFINED.` and the attribute name.

   For example:

   ```
   DRAWING  = USERDEFINED.[Folder 1.Folder 2].MY_ATTRIBUTE "my comment"
   ```

   NOTE Notice the periods after the brackets, and between the hierarchies.

   ---

4. Save the changes.

The new hierarchy is shown in the attribute tree:
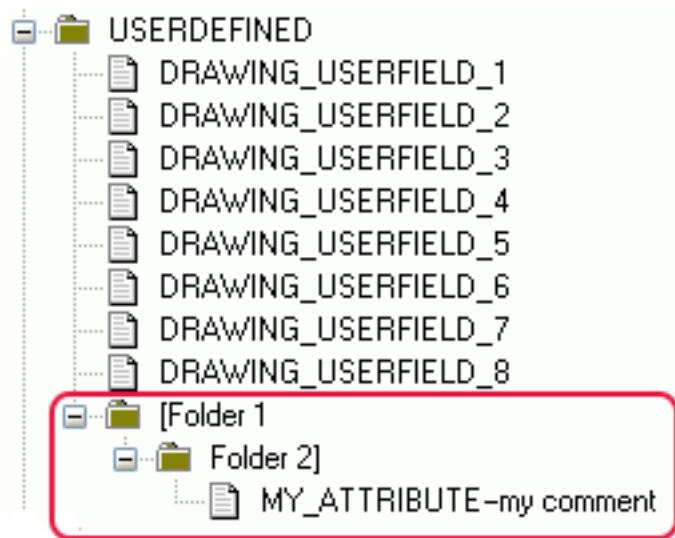
WARNING User-defined attributes are case sensitive. Ensure that you enter the attribute name using the correct case for all characters.

See also

User-defined template attributes (page 361)

6.10 Tips for templates

There are some things that you might consider to be able to use templates more efficiently.

Click the links below to find out more:

- Use text type attribute in calculations (page 366)
- Change value field content to use imperial units (page 367)
- Define customized date format (page 367)
- Assembly or cast unit drawing sheet number (page 368)
- Use format functions in value fields (page 368)

Use text type attribute in calculations

Change text to numeric format

```
double(GetValue("ASSEMBLY_TOP_LEVEL"))
```

Change into correct format for calculation (double=decimals)

```
format(double(GetValue("ASSEMBLY_TOP_LEVEL")),"Length", "mm",
1)
```

Add all above into calculation formula

```
format(double(GetValue("ASSEMBLY_TOP_LEVEL")),"Length", "mm",
1)+15000
```

Another example of the same for part elevation

```
(double(GetValue("TOP_LEVEL"))-
(double(GetValue("BOTTOM_LEVEL"))))*1000
```

Change value field content to use imperial units

Advanced option to check if imperial units are in use:

```
GetValue("ADVANCED_OPTION.XS_IMPERIAL")==TRUE
```

Translated string call for multi lingual text:

```
GetValue("TranslatedText("albl_Diameter_")")
```

Formatting of units:

```
format(GetValue("DIAMETER"),"Length","inch-frac", 1/16)
```

```
format(GetValue("DIAMETER"),"Length","mm", 1)
```

Combine all above in a rule:

```
if GetValue("ADVANCED_OPTION.XS_IMPERIAL")==TRUE then

GetValue("TranslatedText("albl_Diameter_")")+
format(GetValue("DIAMETER"),"Length","inch-frac", 1/16) + "
Inches"

else

GetValue("TranslatedText("albl_Diameter_")")+
format(GetValue("DIAMETER"),"Length","mm", 1)+" mm"

endif
```

Define customized date format

Use mid function to find year, month and day:

```
mid("","","") string, offset, n
```
year:
```
mid(format(GetValue("DATE"),"Date","dd.mm.yyyy", ),"6","4")
```

month:

```
mid(format(GetValue("DATE"),"Date","dd.mm.yyyy", ),"3","2")
```

days:

```
mid(format(GetValue("DATE"),"Date","dd.mm.yyyy", ),"0","2")
```

Combine all above in rule:

```
mid(format(GetValue("DATE"),"Date","dd.mm.yyyy", ),"6","4")
+"-"+
```

```
mid(format(GetValue("DATE"),"Date","dd.mm.yyyy", ),"3","2")
+"-"+
```

```
mid(format(GetValue("DATE"),"Date","dd.mm.yyyy", ),"0","2")
```

Assembly or cast unit drawing sheet number

Use match function to find "-" character

```
match(GetValue("NAME_BASE"),"*-*")
```

Use of mid function to return only characters after "-"

```
mid(GetValue("NAME_BASE"),(1+
(find(GetValue("NAME_BASE"),"-"))),2)
```

Combine all above in rule

```
if (match(GetValue("NAME_BASE"),"*-*"))
```

```
then mid(GetValue("NAME_BASE"),(1+
(find(GetValue("NAME_BASE"),"-"))),2)
```

```
else ""
```

```
endif
```

Use format functions in value fields

You can define the format used in a value field in two ways: In the **Value Field Properties** dialog box by filling in the fields for **Datatype**, **Meaning**, **Unit** and **Decimals**, or by creating a formula in the **Formula** field. In formulas, you can use the format function that converts an attribute value to a formatted information string.

When you use a format function in a formula, always set the **Datatype** to **Text** in the **Value Field Properties** dialog box. Leave the other fields in the **Format** area empty.

For example, if you want to convert the attribute value to numbers with decimals in the report, you need to include the conversion function `double` in the format function:
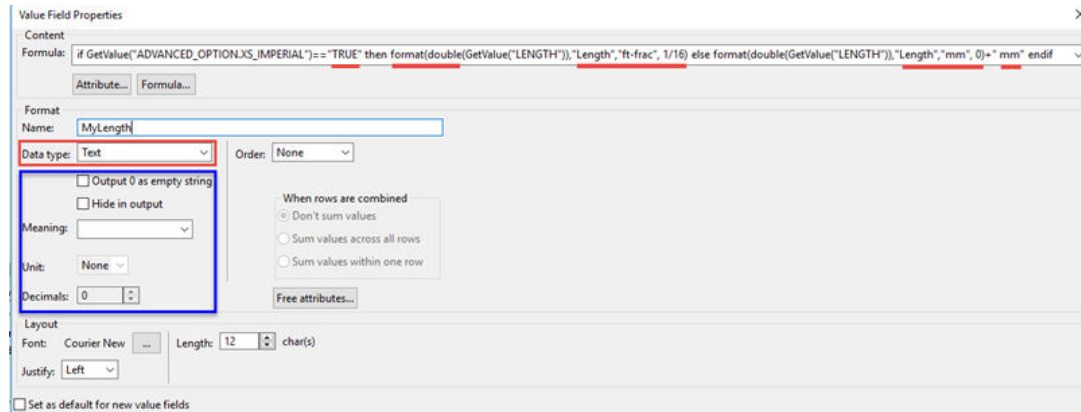
The default values for unit and decimals are defined in the `contentattributes_global.lst` file. The format function converts the attribute value to a formatted information string on the basis of what you have defined in the format function. The format function overrides the definitions in the `contentattributes_global.lst` file and settings that you have defined in the **Format** area of **Value Field Properties** dialog box.

Example of the result in a report when you use the formula above:

```
Mesh Information:

Geometry Size: 4/4-150/150-2750*2000

Length: 9'-1/4"

Height: 6'-6 3/4"
```

Example of the result of the formula, when you use set the advanced option `XS_IMPERIAL` to `FALSE` instead of `TRUE`:

```
Mesh Information:

Geometry Size: 4/4-150/150-2750*2000

Length: 2750 mm

Height: 2000 mm
```

For a list of valid unit and precision strings, see the `valuefieldclasses.lst` file located in the `..\Program Files\Tekla Structures\<version>\nt \TplEd\settings` folder. Do not make changes in this file. Below is an example of the file content, which may change between Tekla Structures versions.

```
//
--------------------------------------------------------------------
```

```
------------
//
// - Use only letters, numbers, slashes and underlines.
//
//
--------------------------------------------------------------------------
------------
//
// Class               =         units { presicions }

Length                 =         mm, dm, cm, m, inch, ft, yd, inch-frac
{1/2, 1/4, 1/8, 1/16 }, ft-frac { 1/2, 1/4, 1/8, 1/16 }
Angle                  =         Degrees, radians
Area                   =         mm2, cm2, dm2, m2, sq.inch, sq.ft, sq.yd
Area/length            =         mm2/m, cm2/m, dm2/m, m2/m, in2/in,
in2/ft, ft2/ft, sq.yd/ft
Volume                 =         mm3, cm3, dm3, m3, cu.in, cu.ft, cu.yd
Weight                 =         kg, T, N, lbf, kip
Weight/length          =         kg/m, T/m, N/m, daN/m, kN/m, lbf/ft
Density                =         kg/m3, T/m3, N/m3, kN/m3, lbf/ft3
Temperature            =         Kelvin, Celsius, Fahrenheit
Section_modulus        =         mm3, cm3, in3
Moment_of_inertia      =         mm4, cm4, in4
Warping_modulus        =         mm6, cm6, in6
Force                  =         kg, T, N, daN, kN, lbf, kip
Force/length           =         kg/m, T/m, N/m, daN/m, kN/m, lbf/in,
lbf/ft, kip/in, kip/ft
Force/area             =         kg/m, kg/cm, kg/mm, T/m, T/cm, T/mm, N/m,
N/cm, N/mm, daN/m, daN/cm, daN/mm, kN/m, kN/cm, kN/mm, lbf/in, lbf/ft,
kip/in, kip/ft
Moment                 =         kgm, Tm, Nm, daNm, kNm, lbf-in, lbf-ft,
kip-in, kip-ft
Moment/length          =         kgm/m, Tm/m, Nm/m, daNm/m, kNm/m, lbf-
ft/ft, kip-ft/ft
Stress                 =         kg/m2, kg/cm2, kg/mm2, T/m2, T/cm2, T/
mm2, N/m2, N/cm2, N/mm2, daN/m2, daN/cm2, daN/mm2, kN/m2, kN/cm2, kN/mm2,
psi, psf, ksi, ksf
Date                   =         dd.mm.yyyy, mm.dd.yyyy, mm/dd/yyyy,
yyyy/mm/dd, dd-mm-yy, dd-mm-yy, yyyy-mm-dd, dd/mm/yy
Time                   =         hh:mm:ss, hh:mm:ss:am/pm
Date&&Time             =         dd.mm.yyyy, mm.dd.yyyy, mm/dd/yyyy,
yyyy/mm/dd, dd-mm-yy, dd-mm-yyyy, yyyy-mm-dd, dd/mm/yy
Date_local             =         dd.mm.yyyy, mm.dd.yyyy, mm/dd/yyyy,
yyyy/mm/dd, dd-mm-yy, dd-mm-yyyy, yyyy-mm-dd, dd/mm/yy
Time_local             =         hh:mm:ss, hh:mm:ss:am/pm
Date&&Time_local       =         dd.mm.yyyy, mm.dd.yyyy, mm/dd/yyyy,
yyyy/mm/dd, dd-mm-yy, dd-mm-yyyy, yyyy-mm-dd, dd/mm/yyLeadingZeroes
LeadingZeroes
DistanceList           =         mm, dm, cm, m, inch, ft, yd, inch-frac
{1/2, 1/4, 1/8, 1/16 }, ft-frac { 1/2, 1/4, 1/8, 1/16 }
```

For more information about value fields, formats, format functions and other functions, see Template Editor User's Guide.

7 Tekla Model Sharing and multi-user for administrators

You can find a table of the differences between Tekla Model Sharing and multi-user models here.

7.1 Tekla Model Sharing

Tekla Model Sharing enables efficient global collaborative modeling within a shared Tekla Structures model. Tekla Model Sharing gives users the freedom to work with the same model at the same time in different locations and time zones.

In Tekla Model Sharing each user has a local version of the model on their computer, or on a network drive, and the model data is shared and synchronized over the Internet using a Microsoft Azure cloud sharing service. When a model is shared, it is connected to the cloud-based sharing service. You can check the status of the service at any time.

NOTE The users of the same shared model need to have the same Tekla Structures version, and use the same latest service pack.

When a user starts to share a model, the organization the user belongs to gets the model ownership. In Tekla Model Sharing, an organization always owns all the models shared by the users in the organization. A shared model is always owned by only one organization. You can manage and view all the shared models owned by your organization with the web-based Management Console for Tekla Model Sharing. Logging in requires Trimble Identity administrator rights.

Tekla Model Sharing requires a valid Tekla Model Sharing license and a Trimble Identity which is part of a valid organization. Based on the Trimble Identity information, you can assign and manage Tekla Model Sharing licenses in the web-based Tekla Online Admin Tool. For more information, see Managing Trimble Identities and Tekla Model Sharing licenses.

Tekla Model Sharing cloud sharing service status is publicly available at Tekla Model Sharing Status. On this web-site, you can also find information about any service breaks.

For more information on how Tekla Model Sharing works, see

-
-
-
-

  - Manage models in Management Console for Tekla Model Sharing

NOTE Tekla Model Sharing requires a single-user model. A model cannot be simultaneously shared and used in the multi-user mode. If you want to start using multi-user mode to share your model instead of Tekla Model Sharing, you first need to exclude your local version of the model from the sharing service and then convert it to a multi-user model.

The excluded model has no connection to the original shared model in the sharing service. This means that if you exclude your local version of the model from the sharing service and start to use the model in multi-user mode, you cannot later merge the original shared model and the multi-user model.

7.2 Multi-user models

You can work on Tekla Structures models in either single-user or multi-user mode. Multi-user mode allows several users to access the same model at the same time. Several users can work on the same project and be aware of the others' progress, so that copying and merging models is not needed.

The multi-user model consists of a single master model that can be located anywhere in the network. Each user can access this model, and open their own local view of the model on a client computer. This local view is called a working model. Any changes that a user makes to the working model are local, and not visible to other users, until the working model is saved to the master model.

The multi-user model is locked during opening, saving, and numbering. When one of the users performs any of these operations, other users cannot perform them during that time. For more information, see .

NOTE All users of the multi-user model should use the same settings and the same version and service pack of Tekla Structures.

Tekla Structures multi-user server runs as a service that is started automatically when you start the computer. You do not need to log in to the service. We recommend that you use the latest multi-user server version available regardless of the Tekla Structures version that you use.

Setting access rights to a multi-user model

You can protect user-defined attributes using privileges. You can also prevent your model and drawings from being accidentally modified by using the **Locked** user-defined attribute (UDA). You can use the UDA for parts (separately for beams, columns, and so on), bolts, welds, specific drawing types, project properties, and phase properties.

Using the **Locked** UDA and privileges together you can even restrict some users or organizations from modifying your model. For more information on access rights, see .

The **Locked** UDA has three values: **Yes**, **No**, and **Organization**. When set to **Yes**, the object is locked and you cannot modify its properties. You can only change the object's user-defined attributes that do not affect numbering. If you try to modify a locked object, Tekla Structures displays the following warning message:

```
There are locked objects, see report. The operation could not
be performed.
```

To add the lock attribute to the user interface, you need to add the following line in the object's section in the `objects.inp` file:

```
 attribute("OBJECT_LOCKED", attribute("OBJECT_LOCKED",
"Locked:", option,"%s", none, none, "0.0", "0.0")
{
value("No", 1)
value("Yes", 0)
value("Organization", 0)
}
```

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Multi-user models

8 Import Tekla Structures model and drawings into another model

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

- It is not possible to import a model or parts of it directly into the same model (for example, if the model folder has been copied in the file system and then worked on separately). You can work around this, for example, by first importing the model into a new empty model or by using the **Save as** command to create a copy of the model.

- If you import to an existing model, fix the possible numbering conflicts by adding prefixes in numbering series.

- Importing models from older versions of Tekla Structures is not allowed. When you try to import an old model, the following message is displayed: "Importing models from previous versions is not supported. First save the model with the current version. Note that you will not be able to use Tekla Structures of previous version to edit the model." Click **Open for upgrade** to open and save the model in the new version, or click **OK**.

- You can use the **Import model** command as a replacement to the old model dump import. Import the model to an empty Tekla Structures model created without a model template.

1. Open the Tekla Structures model into which you want to import the other model.

2. Go to **Quick Launch**, start typing `import model`, and select the **Import model** command from the list that appears.

3. Select a model folder to import and click **OK**.

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

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

9 Import user-defined attribute values

You can import user-defined attribute (UDA) values to a model from a text file. For example, you can import a list of manufactured or checked assemblies. You can also clear existing user-defined attribute values through attribute import.

You can import attribute values to Tekla Structures model objects, drawings, and some reference model objects. In addition to defining matching criteria in the import file, you can also limit the import scope to objects you select in the model or to reference model objects.

The input file can be:

- Exported from other software.
- Created manually using any standard text editor, for example, Microsoft Notepad.
- Created from Microsoft Excel by saving the file with the **Save as** command to **Text (Tab-delimited) (*.txt)** format.
- A simple Tekla Structures report containing the part GUIDs and user-defined attributes.

NOTE There are alternative ways to import data into user-defined attributes. For example, user-defined attributes can be filled in when you import IFC objects and convert them to native Tekla Structures objects. There are also several extensions in Tekla Warehouse that allow you to modify user-defined attribute data.

---

10 Uninstall Tekla Structures

When you no longer need a version of Tekla Structures or related components, you can uninstall to save space on the computer.

Before you uninstall the license server, deactivate the licenses (page 67).

10.1 Uninstall Tekla Structures

Uninstall the Tekla Structures software and environments in the Windows **Control Panel**.

You can have many Tekla Structures versions on your computer. When you install and start using a new version, you do not need to uninstall the older versions.

When you no longer use a Tekla Structures version, you can uninstall it without affecting other installed Tekla Structures versions.

1. Go to the Windows **Control Panel** --> **Programs** --> **Programs and Features**.

2. Select a component, click **Uninstall** and follow the prompts. Follow this order:

   a. Uninstall the service packs.

   b. Uninstall the Tekla Structures environments.

      The environment `.tsep` packages are uninstalled and the environment files are removed.

      When you uninstall an environment of a Tekla Structures software version you are still using, the uninstalled environment is not shown in the Tekla Structures setup dialog box anymore.

      For more information, see Installing .tsep packages (page 15).

   c. Uninstall the main Tekla Structures software.

   d. If installed, uninstall the offline help package.

    e.   If needed, delete the additional files or extensions related to Tekla Structures manually from the installation folders.

3.   If you no longer wish to run any version of Tekla Structures on the computer, uninstall the components that are not version-specific.

    a.   The Tekla Warehouse service and content components.

    b.   The Tekla License Borrow Tool.

        Return a borrowed Tekla license (page 105) before you uninstall the license borrowing tool.

    c.   The Tekla License Administration Tool.

    d.   For uninstalling a Tekla license server, see the instructions below.

10.2 Uninstall the license server

Follow the instructions below when you want to permanently remove the licensing server from this computer. If you are upgrading to a new version on the same computer, see instead.

1.   Make sure that all borrowed licenses are returned (page 105). You can use LMTOOLS to check who has borrowed licenses.

2.   Deactivate Tekla licenses (page 67).

    Deactivating releases the license so that the license can be later activated on another license server installation (applies even to licenses that have expired or updated to a new Tekla Structures version).

3.   Go to the Windows **Services** snap-in and stop the Tekla Licensing Service.

    You can find the snap-in using the Windows start menu search.

4.   Go to the Windows **Control Panel** --> **Programs** --> **Programs and Features**.

5.   Select the Tekla license server and click **Uninstall**.

    If the license server uninstallation fails, uninstall the license server manually.

10.3 Uninstall the license server manually

Automatic Tekla license server installation can normally be uninstalled from the Control Panel.

If the automatic uninstallation cannot be performed, like in the case of manual installation, you need to uninstall the license server manually.

Before you start license server uninstallation, stop FlexNet licensing services and other licensing services.

To manually uninstall the licensing server:

1. Make sure that all borrowed licenses are returned (page 105). You can use LMTOOLS to check who has borrowed licenses.

2. Deactivate Tekla licenses (page 67).

   Deactivating releases the license so that the license can be later activated on another license server installation (applies even to licenses that are updated to a new Tekla Structures version).

3. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.

4. Go to the **Service/License File tab** tab, select **Configuration using Services**, and ensure that Tekla Licensing Service is selected in the list.

5. Go to the **Start/Stop/Reread** tab and click **Stop Server** to stop the license server.

6. Go to the **Config Services** tab, ensure that Tekla Licensing Service is shown in the **Service name** box and then click **Remove Service**.

7. At the command prompt, enter the following command:
   `uninstallanchorservice.exe`

8. Uninstall Tekla license server from the Control Panel to complete the uninstallation.

The Tekla license server is uninstalled.

11 Develop applications using Tekla Open API

You can develop your own applications and additional features for Tekla Structures through the Tekla Open API (Application Programming Interface). Tekla Open API is implemented using Microsoft .NET technology.

Applications that are developed using Tekla Open API to work with Tekla Structures are called *extensions*. To use the power of the Tekla Open API, you must write program code outside Tekla Structures. If you do not know how to program, you can still benefit from the Tekla Open API by downloading extensions created by others from Tekla Warehouse.

With Tekla Open API you can:

- Record and run user interface actions

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

- Create automation tools

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

- Integrate Tekla Structures to other software

    You can utilize the Tekla Open API and .NET in transferring information between Tekla Structures and other software, such as Analysis & Design software.

- Create new functionality.

For more information on Tekla Open API and extensions, visit the Tekla Developer Center.

12 Disclaimer

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