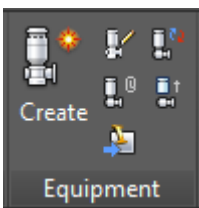


Equipment Models in AutoCAD Plant 3D - Part 1

AutoCAD Plant 3D 2016

In AutoCAD Plant 3D, you can create plant equipment, such as tanks, pumps, boilers, and filters, from parametric shapes or user-defined models, or add custom equipment to a drawing by converting a 3D model from another program.

All equipment related commands are available on the Equipment panel of the Home ribbon.



When you create an equipment model, you define its geometry, location, orientation, and other property information (such as an equipment tag or description).

You can add nozzles to the equipment to define pipework connections and also create templates of equipment for re-use within the current project or in future projects.

AutoCAD Plant 3D provides four distinct methods for creating equipment items:

1. Use a pre-defined parametric model
2. Build your own using a combination of one or more geometric primitive shapes
3. Build your own using AutoCAD objects
4. Import a model from an Inventor AEC export file (*.adsk)

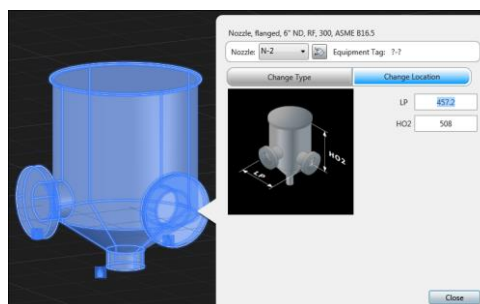
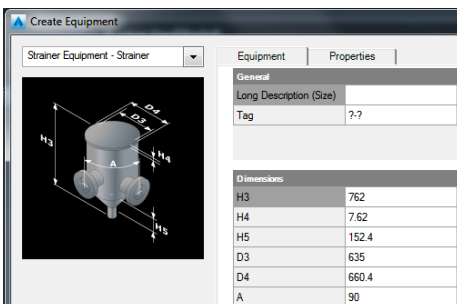
Regardless of the method used, you can save the resulting equipment model to an equipment template file (*.peqs) for re-use.



Pre-defined Parametric Models

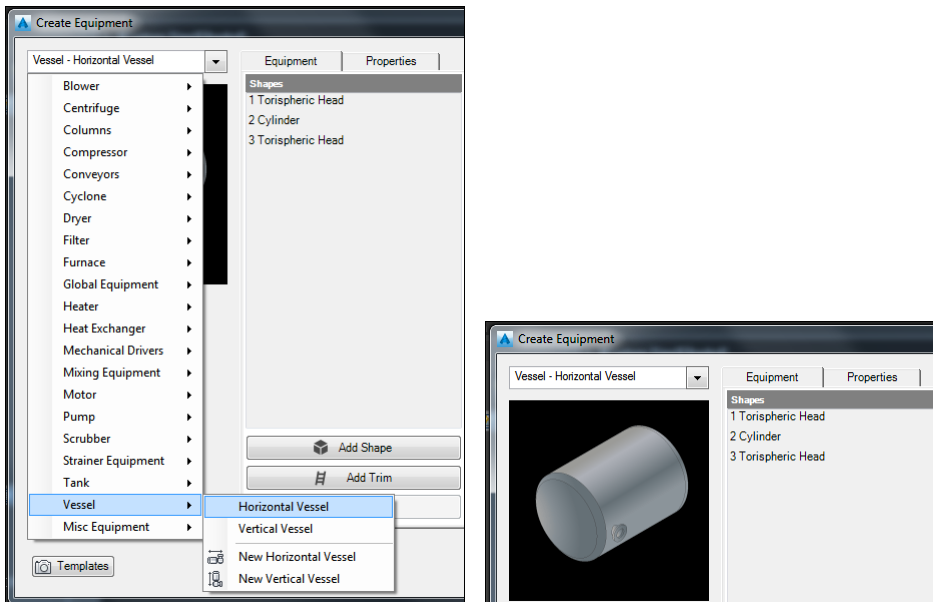
AutoCAD Plant 3D provides several pre-defined parametric models of pumps and one model of strainer.

These shapes are pre-defined and although their dimensions may be modified, their basic shapes are fixed. The positions of nozzles for piping connections are also fixed, but you can modify their sizes and types.



Primitive Geometric Shapes

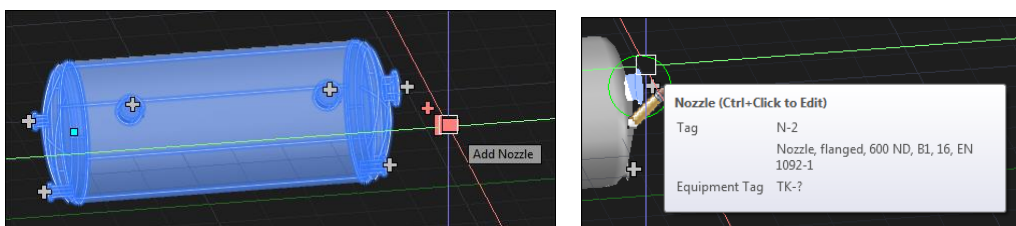
You can create any type of equipment by combining one or more primitive geometric shapes. Some types have pre-defined models already provided.



For example, simple Horizontal and Vertical vessels are provided. You can modify these as required. Alternatively, you can choose any **New** style to start from scratch.

You build Vertical models from the top down and Horizontal models from right (at the top of the list of shapes) to left.

When you have defined the geometry and other properties in the **Create Equipment** window, you click the Create button to position the equipment in your Plant project then add nozzles to the equipment model in your drawing.



The above example shows a horizontal vessel built from primitive shapes with 6 nozzles defined.

Notice that when you select the equipment item, the **Add Nozzle** glyph is displayed plus a continuation grip for each of the defined nozzles. To select a nozzle to edit it or remove it, you must use **Ctrl+Click** to select the nozzle; this will display the **Edit Nozzle** (pencil) glyph.

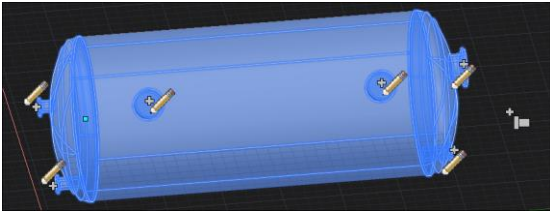
Also, when you add a nozzle, additional geometry to represent the nozzle is added to the model of your equipment item.

AutoCAD Objects

You can create your own 3D equipment models using AutoCAD objects, usually solids and surfaces, and then convert these

to Plant 3D equipment models to add them to your Plant project.

When you do so, you can mark the location and orientation of nozzles and define their size and type but AutoCAD Plant 3D will not add geometry to the equipment model to represent them; it is assumed that nozzles are already been shown.



The example above shows a similar vessel to the previous one, but this time created from AutoCAD objects and converted to a Plant 3D equipment model. Notice that as soon as you select the model in Plant 3D, an **Edit Nozzle** glyph is displayed against each marked nozzle.

Inventor Models

If you already have a detailed model of an item of equipment in Inventor format, you can import the model into AutoCAD Plant 3D via an AEC export file (*.adsk) from Inventor.

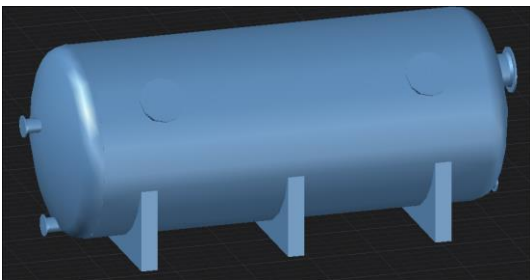
AutoCAD Plant 3D will automatically recognise the position and specification of any piping connections that you have defined in your Inventor model and create corresponding nozzles in the Plant equipment model. You can modify these if necessary and also add or remove additional nozzles.

Once imported, these models behave in exactly the same way as equipment models converted from AutoCAD objects.


Attaching Additional Geometry

You can attach additional objects to equipment models, making them a part of the equipment. You may attach objects such as brackets, supports, foundations and railings to add more detail to the model.

Once you attach an object to an equipment model, it becomes part of the model, and is moved, copied, or deleted along with it.



Here is the vessel with attached supports.

 To edit an attached object, you must first detach it from the equipment. After editing, you can attach it again. Note that you cannot selectively detach an object; you can only detach all attached objects together.

To Modify an Equipment Model

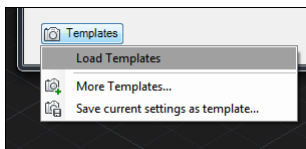
To alter the size or shape of an equipment model created from a pre-defined shape or geometric primitives, you use the **Modify Equipment** button – this provides access to the shape geometry.

If you need to alter the size or shape of an equipment model created from AutoCAD objects you must first **Explode** the model to native AutoCAD objects, edit the model and then convert back to an equipment model. You will also need to mark the nozzles again.

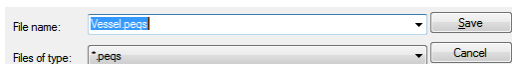
To Save an Equipment Template

You can save any equipment model to an equipment template file (*.peqs) for later use. The template defines the geometry of the equipment model and includes all nozzle definitions and any property values that have been entered.

To save the template, you select the equipment model in your Plant drawing and click the **Modify Equipment** button. In the lower left corner of the Modify Equipment window you will see a **Templates** button.



When you click the button you can choose to save your current equipment model as a template. You can choose the name and location of the template file (*.peqs). The location will default to the Equipment Templates folder of your current Plant project.



You can save your equipment templates to a central location outside of the Plant project folder hierarchy to create a library of equipment templates that can be used across multiple projects.

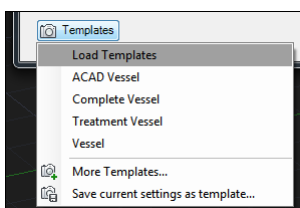
Note that Plant actually creates two files for each equipment template: a **.peqs** file that contains internal Plant settings, nozzle definitions and property data and a **.dwg** file that contains an AutoCAD object drawing of the equipment.

If your equipment model is a pre-defined parametric model or is defined entirely by primitive geometric shapes then the **.peqs** file fully defines your model. However, if you have attached AutoCAD objects to your model or have imported an Inventor model then this geometry is saved in the **.dwg** file.

To Create an Equipment Model from a Template

You can create an equipment model from an equipment template file (*.peqs) that you have saved previously.

To do so, you click the **Create Equipment** button and then click the **Templates** button in the lower left corner of the Create Equipment window. Available templates that located in the Equipment Templates folder of your current Plant project are listed. To find a template that is stored outside of your current project you select More Templates... and browse to the location of the equipment template that you require.



When you select a template from the list, the definition is immediately loaded into the Create Equipment window.

You can make modifications to the equipment model before you create it in your Plant drawing. However, you can only make changes to nozzle definitions once you have created the equipment model in your Plant drawing.

