Equipment and Furnishings
User's Guide

Process, Power & Marine

INTERGRAPH

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Preface

This document is a user's guide for the SmartPlant® 3D Equipment and Furnishings task and provides command reference information and procedural instructions.

SmartPlant 3D Documentation Set

The SmartPlant® 3D documentation set is available as Adobe® PDF files. The content of the PDF files is the same content as online Help. To access these PDF documents in the software, click **Help > Printable Guides**.

The documentation set is divided into four categories:

- Administrative guides contain information about installing, configuring, customizing, and troubleshooting SmartPlant 3D.

- User's guides provide command reference and how-to information for working in each SmartPlant 3D task.

- Reference data guides define the reference data workbooks. Not all tasks have reference data.

- Third-party guides from other vendors for software that works with SmartPlant 3D.

Administrative Guides

SmartPlant 3D Installation Guide - Provides instructions on installing and configuring the software on both the client and server computers.

SmartPlant 3D/IntelliShip Programmer's Guide - Provides information about custom commands, naming rules, and symbol programming.

SmartPlant 3D Reference Data Guide - Provides instructions about the Bulkload utility, codelists, and the reference data common to several disciplines.

SmartPlant 3D Symbols Reference Data Guide - Provides information about the Visual Basic Part Definition Wizard and the three-dimensional symbols used in all tasks.

SmartPlant 3D The Engineering Framework Reference Guide - Provides information about installing, configuring, and using The Engineering Framework with SmartPlant 3D.

SmartPlant 3D Troubleshooting Guide- Provides information on how to resolve errors that you may encounter in the software by documenting troubleshooting tips, error messages, and to do list messages.

User's Guides

Catalog User's Guide - Provides information about viewing, editing, and creating reference data and select lists (codelists).

Common User's Guide - Provides information about defining workspaces, navigating in the model, precision input, filtering, manipulating views, and running reports.

Drawings and Reports User's Guide - Provides information about creating drawing and report deliverables.

Electrical User's Guide - Provides information about routing electrical cable, cableway, cable tray, and conduit.

Equipment and Furnishings User's Guide - Provides information about placing equipment.

Grids User's Guide - Provides instructions for creating coordinate systems, elevation grid planes, vertical grid planes, radial cylinders, radial planes, grid arcs, and grid lines.

Hangers and Supports User's Guide - Provides instructions on placing piping, duct, cableway, and conduit supports in the model.

HVAC User's Guide - Provides instructions for routing HVAC duct.

Piping User's Guide - Provides instructions for routing pipe and placing valves, taps, and pipe joints.

Project Management User's Guide - Provides instructions for setting up the databases, creating permission groups, backing up and restoring project data, assigning access permissions to the model, managing interference detection, defining and managing locations for Global Workshare, controlling duplication and consolidation of plants, tools for synchronization, regeneration of report databases, and version upgrade.

Space Management User's Guide - Provides instructions for placing volumes (such as drawing volumes, obstruction zones) in the model.

Structural Analysis User's Guide - Provides instructions for defining loads, load cases, load combinations, and the importing and exporting of analytical data.

Structure User's Guide - Provides instructions for placing structural members such as: beams, columns, braces, slabs, openings, stairs, ladders, equipment foundations, and handrails.

Systems and Specifications User's Guide - Provides instructions for creating systems and their hierarchies and selecting which specifications are available for each system type.

SmartPlant 2D Symbols User's Guide - Provides instructions for creating cross section symbols.

Reference Data Guides

Drawings and Reports Reference Data Guide - Provides information about reports reference data.

Electrical Reference Data Guide - Provides information about electrical cable, cableway, cable tray, and conduit reference data.

Equipment and Furnishings Reference Data Guide - Provides information about equipment reference data and name rules.

Hangers and Supports Reference Data Guide - Provides information about hangers and supports reference data.

HVAC Reference Data Guide - Provides information about HVAC reference data.

Piping Reference Data Guide - Provides information about piping reference data including piping specifications, piping specification rules, piping parts, piping symbols, and name rules.

Space Management Reference Data Guide - Provides information about space management reference data.

Structure Reference Data Guide - Provides information about structural reference data and name rules.

Third-Party Guides

AText Reference Guide - Provides information about alternative text for isometric drawings. This guide is from Alias, the makers of ISOGEN®.

Option Switches Reference Guide - Provides information about the ISOGEN option switches for isometric drawings. This guide is from Alias, the makers of ISOGEN.

Symbol Keys Reference Guide - Provides information about the symbol keys for isometric drawings. This guide is from Alias, the makers of ISOGEN.

Documentation Comments

Send documentation comments or suggestions to PPMdoc@intergraph.com.

What's New in Equipment and Furnishings

Version 6.0

- Added the **Place Equipment Component** command. For more information, see *Place Equipment Component Command*, page 28.

- Added the **Place Designed Equipment Component** command. For more information, see *Place Designed Equipment Component Command*, page 61.

- Added the **Replace Equipment** command. For more information, see *Replace Equipment Command*, page 73.

- Added information on correlating equipment for use with The Engineering Framework. For more information, see *Correlate Existing Equipment For Use With The Engineering Framework*, page 125, *Correlate New Equipment For Use With The Engineering Framework*, page 126, and *Update Equipment For Use With The Engineering Framework*, page 127.

- You can now place round or flat oval HVAC nozzles on equipment.

- Added floating palette for placing shapes. For more information, see *Place Shape Command*, page 65.

- Added browse for predefined ports values in the Catalog.

- Added rotate by arrow keys.

- Support occurrence properties for nozzles in equipment.

- Ability to add foundation port to Designed Equipment.

- Change nozzle angle reference to be consistent with PDS.

- Ability to set the position and orientation of equipment, equipment components, shapes, and nozzles as referenced from the active coordinate system.

- Provide one-click access to placement of Designed Equipment shapes.

Equipment and Furnishings: An Overview

During plant design, you can use the Equipment and Furnishings task to select equipment objects from the Catalog database and position occurrences of these objects in the model using the **Place Equipment** command. The software can also automatically orient the mounting surface of the part during placement to whatever surface you select in the model. After placed, you can precisely position the equipment relative to other parts, structural features, or grid systems within the model by defining additional positioning relationships or using the **Rotate Equipment** command.

Typically, several pieces of equipment are placed in an approximate position, and then the position of those parts is refined relative to each other and the surrounding structure. After the parts are in their final position, structural foundations are added using the Structure task, and piping connections are made using the Piping task.
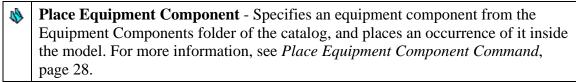
The equipment definition in the Catalog consists of a geometric model of the equipment and a set of descriptive properties. The model geometry is sufficiently detailed to serve the purposes of three dimensional visual recognition and interference detection. The equipment models include detailed definitions of the piping, electrical, and HVAC connections. These connections can be located by the appropriate applications. The software delivers a catalog of basic equipment with the software, including commonly used parts like pumps and storage tanks, but you can customize this standard catalog or modify the default equipment to match the specific needs of your project.

Using Visual Basic, Solid Edge or the Equipment and Furnishings task's designed equipment capability to create the graphical 3-D representation of the equipment and using the Catalog task to define properties for the parts, you can create any type of equipment that you might need. You can even create parametric equipment models that can be resized after the object is placed in the model. The equipment that you add to your Catalog can be referenced and used on any number of separate designs.

You can start the Equipment and Furnishings task by clicking **Tasks > Equipment and Furnishings**. The Equipment and Furnishings task has the following task-specific commands:

	Select - Used to select objects in the model. For more information, see *Editing Properties and Relationships: An Overview*, page 82.
	Place Equipment - Specifies a piece of equipment from the Equipment folder of the catalog, and places an occurrence of it inside the model. For more information, see *Place Equipment Command*, page 15.
	Place Designed Equipment - Places equipment types that have been defined in the reference data. For more information, see *Place Designed Equipment Command*, page 32.

	Place Equipment Component - Specifies an equipment component from the Equipment Components folder of the catalog, and places an occurrence of it inside the model. For more information, see *Place Equipment Component Command*, page 28.
	Place Designed Equipment Component - Places equipment components that have been defined in the reference data. For more information, see *Place Designed Equipment Component Command*, page 61.
	Place Shape - Adds additional shapes or equipment objects to an existing designed equipment type. The icon displayed on the toolbar is the icon of the last shape selected from the palette. For more information, see *Place Shape Command*, page 65.
	Place Nozzle - Adds different types of ports to a designed equipment object. For more information, see *Place Nozzle Command*, page 67.
	Place Imported Shape from File - Adds geometry to a designed equipment object that was modeled with solid modeling software and saved to a format. For more information, see *Place Imported Shape from File Command*, page 71.
	Rotate Equipment - Repositions equipment by rotating along a universal axis defined for the model view as well as an occurrence axis unique to the equipment itself. For more information, see *Rotate Equipment Command*, page 79.
	Replace Equipment - Exchanges a selected piece of equipment or equipment component in the model for a different item from the catalog. For more information, see *Replace Equipment Command*, page 73.

Related Topics

- *Editing Properties and Relationships: An Overview*, page 82
- *Moving Equipment: An Overview*, page 75
- *Placing Designed Equipment: An Overview*, page 33
- *Placing Equipment from the Catalog: An Overview*, page 15
- *Rotating Equipment: An Overview*, page 79

Understanding the Equipment and Furnishings Workflow: An Overview

All equipment objects are placed in the model using information defined in the equipment and furnishings reference data. Using the reference data workbook, you can create custom equipment objects. Your first step should be to review, edit, and otherwise customize the delivered equipment and furnishings reference data. For more information, refer to the *Equipment and Furnishings Reference Data Guide* available from the **Help > Printable Guides** command within the software.

After the reference data is customized to suit your needs, consider going to the Systems and Specifications task, or right-clicking in the **Workspace Explorer** and selecting **Create System** to define the systems in your model. You are not absolutely required to create your systems first; however, doing so keeps you from having to edit your equipment objects after placement to assign them to the correct system.

After the equipment reference data and the needed systems are defined, you can begin placing equipment objects in your model.

You can interactively customize equipment from the Catalog by adding primitive geometric shapes and nozzles.

You can also use the Equipment and Furnishings task to build customized equipment. Designed equipment objects can be built entirely out of primitive geometric shapes, or an equipment component part can designed or placed from the catalog to enhance the designed equipment object.

Equipment components provide a more precise method of building up designed equipment than the technique of adding catalog equipment to designed equipment used by previous versions of the software.

Related Topics
- *Equipment and Furnishings Common Tasks*, page 13

Equipment and Furnishings Common Tasks

The following tasks are used frequently in the Equipment and Furnishings task.

Customize Reference Data
- Create new equipment types by editing the **Equipment.xls** workbook. Review, add, and edit material information. For more information, see the *Equipment and Furnishings Reference Data Guide*, available from the **Help > Printable Guides** command within the software.

Create Needed Systems

- Create new equipment systems. For more information, see *Create an Equipment System*, page 14.

Place Equipment From the Catalog

- Place equipment objects directly from the Catalog. For more information, see *Place Equipment from the Catalog*, page 25.

Build Customized Equipment Definitions

- Combine basic geometric shapes, ports, and properties to model designed equipment objects. For more information, see *Place Designed Equipment*, page 59, *Place a Shape*, page 66, and *Place a Nozzle*, page 68.

- Import graphics from a SAT file as the geometry for a designed equipment object. For more information, see *Place an Imported Shape*, page 72.

- Use prismatic shapes to create uniquely customized equipment objects. For more information, see *Creating Customized Shapes: An Overview*, page 34.

Set Positioning Relationships

- Creates a relationship between placed equipment and any other surface or reference element that you select. For more information, see *Set Positioning Relationships for Equipment*, page 27 and *Set Positioning Relationships for Designed Equipment*, page 60.

Create an Equipment System

1. Click **Tasks > Systems and Specifications**.
2. In the tree view, select the system in which to create the equipment system.
3. From the ribbon, select **New Equipment System** .
4. Select the new system in the tree view, and then right-click and select **Properties**.
5. Change any properties as needed.

 Note

- You can right-click in the **Workspace Explorer** and select **Create System** from the menu instead of starting the Systems and Specifications task.

Place Equipment Command

Specifies any piece of equipment from the Equipment folder of the catalog and places an occurrence of it inside the model. You can modify the offset of the equipment, its relationships to other equipment, and other properties during or after placement. Using positioning relationships, the **Place Equipment** command allows you to mate, connect, or align equipment, and you can use common tools like the **PinPoint** command for precise positioning of the equipment.

Related Topics
- *Place Equipment from the Catalog*, page 25
- *Place Equipment Ribbon*, page 22
- *Placing Equipment from the Catalog: An Overview*, page 15
- *Replace Equipment*, page 73
- *Select Equipment Dialog Box*, page 21

Placing Equipment from the Catalog: An Overview

You place equipment objects into the model by selecting the equipment from the **Select Equipment** dialog box and positioning the equipment in the model using the available relationships. When you select an equipment object from the Catalog, you can define a default surface so that, when the equipment is placed into the model, the software automatically creates a relationship to any other surface or reference element that you select. For example, you might define the bottom of a pump as the default surface because you want the software to mate that surface to the floor. If the software cannot find a suitable mating surface for the equipment, the equipment object is placed in free space, pending additional design of the structures or other reference elements.

You can also provide an optional offset distance from the surface or reference elements. The default offset distance for any new piece of equipment is zero or the last offset used in the current session. The software maintains the offset relationship between the default surface and the surface or reference element in the workspace in the event of any changes to their position (for example, if a slab is lowered, then the equipment follows the slab, maintaining the offset). You can further define the equipment position and orientation by mating, aligning, or connecting equipment to other objects in the model, or by moving or rotating the equipment.

In addition to placing equipment from the **Select Equipment** dialog box, you can also drag and drop equipment directly from the **Catalog Browser** in another session opened on the same computer. In this case, if you have defined a default surface, the software will place the equipment directly onto a surface or reference element that you select. If you do not define a default surface or reference element, the software

places the equipment in free space, with no relationship to other elements in the model.

Related Topics
- *Place Equipment from the Catalog*, page 25
- *Positioning Relationships: An Overview*, page 16
- *Replace Equipment*, page 73
- *Rotating Equipment: An Overview*, page 79
- *Select Equipment from the Catalog*, page 24
- *Set Positioning Relationships for Equipment*, page 27

Positioning Relationships: An Overview

The following positioning relationships between equipment and reference elements are available:

Mate - The mate relationship is applied between a surface of the equipment and another equipment surface, structural surface, elevation plane, or grid plane. The surfaces are constrained to be parallel with the indicated offset distance between them. The normal vector pointing out from the surface of one solid points toward the other solid:

The mate relationship can also be applied between the axis of a cylindrical surface and a planar surface. The offset in this situation is applied in the direction of the surface normal. You can use this relationship to orient the nozzle axis of an equipment parallel to a wall and offset from the wall a given distance.

Align - The align relationship makes the axes of two cylindrical surfaces collinear or constrains two planar surfaces to be parallel. When planar surfaces are aligned, the surface normals point in the same direction with the indicated offset distance between them:
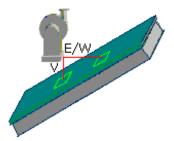
Connect - The connect relationship forces a point on an equipment to be coincident with a point on another equipment, structure, piping part, or arbitrary coordinate in space. The software adds the connect relationship to the relationship list only if the two points connected are both nozzles. Otherwise, the two points are made coincident, but no relationship is saved to the database. Offsets are disabled when establishing a connect relationship.

✏ **Note**

- Press F3 to turn on or off the Surface Locate option. This option makes it easier to create Connect relationships.

The minimum distance constraint is used to locate a point on an equipment object at a specified distance (horizontal or vertical) from a sloped surface, edge, or point.
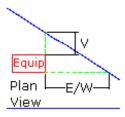
Three constraint options are available: **E/W Distance** (horizontal along the East/West axis), **N/S Distance** (horizontal along the North/South axis), and **Vertical Distance** (vertical along Up/Down axis). These constraints are not available for Designed Equipment.
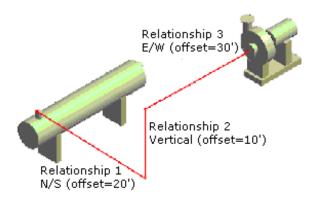
✏ **Note**

- The referenced axes are in the active coordinate system.
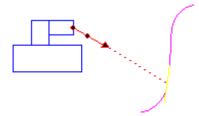
Choose a control point on the equipment that you are placing or editing and a reference surface, edge, or point. Any selectable point on the equipment (SmartSketch points, connect points) may be used in the relationship, and the sloped surface may be at any orientation relative to the equipment.

As illustrated in the following example, the three minimum distance relationships can be used collectively to define separate relationships to fully constrain equipment objects.

Mate to Tangent Plane - Using the mate to tangent plane relationship, you can create a tangent plane at the intersection of a user-defined vector and a selected surface. You establish the relationship by first selecting a reference on an equipment object and then selecting two points in the model to define a vector and identify a surface (in the model. The vector is used to locate an intersection point in the model. A plane tangent to the surface (at the intersection point) is created and used as the mating surface.

Both the vector and the surface are associative inputs; if the referenced surface is modified, the point and the ensuing tangent plane are re-computed.
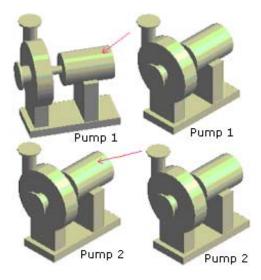
Parallel - Parallel relationships can be set between the following objects:

- Edge to planar surface

- Surface to surface

- Edge to edge

- Edge to axis (implied axis of cylindrical objects)

- Axis (implied axis of cylindrical objects) to axis (implied axis of cylindrical objects)

In terms of behavior, the parallel relationship is similar to align. However, while the align relationship rotates and moves an equipment object, the parallel relationship only rotates the object. As such, if you orient a pump by setting a particular nozzle axis parallel to a nozzle axis on a different equipment object, only the orientation of

the equipment is affected, not its location. This option is not available for Designed Equipment.

In the following illustration, the motor of the P1 object is selected as an input for the parallel constraint, and the motor of the P2 object is selected as the reference. The result is that the P1 object is rotated (but not moved) so that the two motors are parallel.

Related Topics
- *Place Equipment from the Catalog*, page 25
- *Replace Equipment*, page 73
- *Rotating Equipment: An Overview*, page 79
- *Select Equipment from the Catalog*, page 24
- *Set Positioning Relationships for Equipment*, page 27

Placing Equipment Components from the Catalog: An Overview

Equipment components represent a sub-portion of an equipment item. One example may be a storage tank with support lugs and a platform. The support lugs, tank body, and platform may all be considered components of a final functional tank.

Components may be a purchased item that is represented in the catalog as a standard component (such as a tank), or they may be built up of many different shapes and other components (such as an equipment platform). Components from a catalog may be placed as children of a designed equipment item, but they may not be placed as a child of another equipment component.

You place equipment components into the model by selecting the equipment component part from the **Select Equipment Component** dialog box and positioning the equipment component in the model using the available relationships.

Related Topics
- *Place Equipment Component Command*, page 28
- *Place Equipment from the Catalog*, page 25
- *Positioning Relationships: An Overview*, page 16
- *Replace Equipment*, page 73
- *Rotating Equipment: An Overview*, page 79
- *Select Equipment from the Catalog*, page 24
- *Set Positioning Relationships for Equipment*, page 27

Assigning Part Names at Placement: An Overview

Every task that creates new parts in the model must assign a part name to each new part.

In the Equipment and Furnishings task, the part name is automatically generated using the default name rule when you place the part. The name consists of the part number of the equipment, and a random number. The part number is defined on the part class worksheet in **Equipment.xls**.

You can change the part name on the **Occurrence** tab of the **Equipment Properties** dialog box for each part. When you override the automatically generated part name in the **Name** box on the **Occurrence** tab, the text in the **Rule** box changes to **User Defined**.

Related Topics
- *Equipment Properties Dialog Box*, page 87
- *Place Equipment from the Catalog*, page 25
- *Placing Equipment from the Catalog: An Overview*, page 15
- *Replace Equipment*, page 73

Select Equipment Dialog Box

Specifies the equipment needed for placement. This dialog box appears automatically when you click the **Place Equipment** command. By browsing through the part hierarchy, you can find any piece of equipment in the Catalog database. After you select a part, the software returns you immediately to the model, where you can finalize configuration and placement.

Back - Returns you to the previously selected equipment part or node. Use this command to navigate through the equipment hierarchy to the specific part you need.

Forward - Sends you to the last selected equipment part or node that you moved away from by using the **Back** button. Use this command to navigate through the equipment hierarchy to the specific part you need.

Up One Level - Brings up the next highest level of the Equipment catalog hierarchy. Use this command to navigate through the equipment hierarchy to the specific part you need.

Properties - Displays the equipment properties as defined in the catalog.

Preview - Displays a bitmap symbol of the selected equipment. The image file must be assigned to the equipment in the catalog reference data.

List View - Sets the dialog box to display equipment in a list view.

Grid View - Sets the dialog box to display equipment in a spreadsheet-style grid view.

Related Topics
- *Place Equipment Command*, page 15
- *Place Equipment from the Catalog*, page 25
- *Placing Equipment from the Catalog: An Overview*, page 15
- *Replace Equipment Command*, page 73
- *Replace Equipment*, page 73

Place Equipment Ribbon

Sets options for adding equipment to your model. This ribbon appears automatically after you select the **Place Equipment** command and then select an equipment object, or when you select an existing piece of equipment.

💡 Tip

- To find out the name of an option on the ribbon, pause the pointer over an option and read the ToolTip.

Equipment Properties - Edits the occurrence properties and reviews the static properties of an existing piece of equipment. Equipment properties can be set only after an equipment object is placed in the model. Equipment properties can be edited only after the object is placed in the model.

✏️ Note

- Any object modeled in Solid Edge that has occurrence properties cannot be placed or modified unless your computer has a copy of Solid Edge installed.

Relationship List - Lists all relationships for the selected equipment and provides an option for creating a new relationship if the equipment is not already fully constrained. An equipment part is fully constrained when it has sufficient defined relationships to prevent movement or rotation of the part along all three coordinate axes.

Positioning Relationships - Displays the available options for types of positioning relationships. Some options may not be available for all equipment types. See *Positioning Relationships: An Overview*, page 16 for more information.

Delete Relationship - Removes the selected relationship from the equipment model and the database. Using the **Relationships** list box, select a previously existing relationship for the equipment, and click **Delete Relationship**. You can use this command only when modifying existing equipment.

Equipment Reference - Prompts you for the reference on the equipment to be placed that will be affected by the positioning relationship. In all cases, the part that you select in this step moves to create the relationship, and the part chosen in the **Second Part Reference** step remains fixed.

Second Part Reference - Prompts you for the reference on the equipment object or reference element already in the model that will be affected by the positioning relationship. After you select the reference, the software repositions the first equipment part chosen with respect to the second part selected in the definition of the relationship.

Offset - Defines the offset distance for a mate or align relationship. Offsets are disabled when establishing a connect relationship. You can adjust this value after initial equipment placement if needed.

Name - Displays the equipment name, as dictated by your predefined name rules, and accepts changes to that name.

System - Specifies the system with which to associate the selected equipment. The default system is the plant itself.

Related Topics
- *Place Equipment Command*, page 15
- *Place Equipment from the Catalog*, page 25
- *Placing Equipment from the Catalog: An Overview*, page 15
- *Replace Equipment Command*, page 73
- *Replace Equipment*, page 73

Select System Dialog Box

This dialog box displays all of the defined equipment systems so that you can select the equipment system.

Look in - Specify where to look for the equipment system. Select **Workspace** to look for the equipment system in your defined workspace only. Select **Database** to look for the equipment system in the entire Model database.

Select Equipment from the Catalog

1. Click **Place Equipment** ![icon] on the vertical toolbar.

2. On the **Select Equipment** dialog box, locate the necessary equipment type using the tree view. Expand the nodes for the general type of equipment that you need, continuing until a list of available parts appears in the catalog window.

3. In the list view, select the equipment object.

4. Click **OK** to return to the workspace and place the equipment.

   Place Equipment from the Catalog, page 25

![icon] Notes

- You can also double-click the necessary part in the list view to select the part and go directly back to the workspace.

- Only parts in the Equipment folder of the catalog are available for placement in the Equipment and Furnishings task.

- While placing the equipment, you can select planes and other surfaces to automatically create a mate at placement time.

Related Topics
- *Place Equipment Command*, page 15
- *Place Equipment from the Catalog*, page 25
- *Placing Equipment from the Catalog: An Overview*, page 15
- *Replace Equipment Command*, page 73
- *Replace Equipment*, page 73
- *Select Equipment Dialog Box*, page 21

Place Equipment from the Catalog

1. Click **Place Equipment** on the vertical toolbar.

2. Select the equipment from the **Select Equipment** dialog, and click **OK**.

   Select Equipment from the Catalog, page 24

3. Click in a graphic view to select the mounting surface and approximate position for the equipment.

   💡 **Tip**

   - You can press the left and right arrow keys to rotate the equipment by 90-degree increments at any time during the placement of the equipment. Press the up arrow key to scroll through the three possible axes of rotation.

4. Using the **Place Equipment** ribbon, do any of the following, if necessary:

   - Set an offset for the equipment relationship by entering the distance in the **Offset** box.

   - Click **Properties** on the ribbon, and enter any necessary property information in the grid provided on the **Equipment Properties** dialog box.

     Edit Equipment Properties, page 93

   💡 **Tip**

   - You can view the definition properties of the equipment object using the **Properties** command within the **Select Equipment** dialog box on the equipment property page after you place the equipment. The occurrence properties for an equipment object can be defined or modified after the equipment object has been placed in the model.

5. If necessary, add or change a positioning relationship by selecting it from the **Relationship** dropdown list on the **Place Equipment** ribbon.

   Set Positioning Relationships for Equipment, page 27
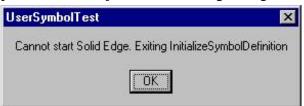
6. Choose a system with which to associate the new equipment in the **System** box.

📝 **Notes**

- If you are going to use an object for routing cable, you must not model that object as equipment. For example, a pull box should be created in the catalog data as a conduit fitting, not a piece of equipment. Otherwise, the object will render conduit networks useless for cable routing every time it is used.

- If you are going to use an object for routing cable, you must not model that object as equipment. For example, a pull box should be created in the

catalog data as a conduit fitting, not a piece of equipment. Otherwise, the object will render conduit networks useless for cable routing every time it is used.

- You cannot place equipment with occurrence properties modeled using Solid Edge unless Solid Edge is installed on your computer. If you try to place such an object, the following dialog box appears:

Important

- As a workaround to the Solid Edge requirement, you can use the Bulkload utility with the flavors option. Plant designers can create dozens of variations for any equipment part imaginable. Also, by creating several variations of a part, rather than using occurrence properties to create the variations automatically, designers can implement custom Solid Edge equipment without having to install Solid Edge on every designer's computer.

  Each variation of a part represents some minor deviation from the catalog part, be it on the basis of size, operational specifications, or material. With Solid Edge, new variations can be created on the basis of size, while the software allows manipulation of the operating parameters or material of construction in the reference data. For more information on bulk loading with flavors, refer to the *SmartPlant 3D Reference Data Guide*, accessible from the **Help > Printable Guides** command in the software.

Related Topics
- *Place Equipment Command*, page 15
- *Place Equipment Ribbon*, page 22
- *Placing Equipment from the Catalog: An Overview*, page 15
- *Replace Equipment Command*, page 73
- *Select Equipment Dialog Box*, page 21

Set Positioning Relationships for Equipment

1. Select the equipment for which you need to define a relationship.

2. In the **Relationship List** box on the **Place Equipment** ribbon, choose **<New Relationship>**.

3. Select one of the available positioning relationships in the **Positioning Relationships** list box and follow the status bar prompts.

✎ Note

- Depending on the type of positioning relationship defined in the previous step, surfaces or points need to be defined to finish configuring the relationship. For more information, see *Positioning Relationships: An Overview*, page 16.

Related Topics
- *Place Equipment from the Catalog*, page 25
- *Placing Equipment from the Catalog: An Overview*, page 15
- *Replace Equipment*, page 73

Place Equipment Component Command

Specifies any equipment component from the Equipment Components folder of the catalog and places an occurrence of it inside the model. You can modify the offset of the component, its relationships to other equipment, and other properties during or after placement. Using positioning relationships, the **Place Equipment Component** command allows you to mate, connect, or align equipment components, and you can use common tools like the **PinPoint** command for precise positioning of the component.

Related Topics
- *Place Equipment Component from the Catalog*, page 30
- *Place Equipment Component Ribbon*, page 28
- *Placing Equipment Components from the Catalog: An Overview*, page 19
- *Select Equipment Dialog Box*, page 21

Place Equipment Component Ribbon

Sets options for adding equipment components to your model. This ribbon appears automatically after you select the **Place Equipment Component** command and then select an equipment object, or when you select an existing equipment component.

Tip

- To find out the name of an option on the ribbon, pause the pointer over an option and read the ToolTip.

Equipment Properties - Edits the occurrence properties and reviews the static properties of an existing piece of equipment. Equipment properties can be set only after an equipment object is placed in the model. Equipment properties can be edited only after the object is placed in the model.

Note

- Any object modeled in Solid Edge that has occurrence properties cannot be placed or modified unless you computer has a copy of Solid Edge installed.

Relationship List - Lists all relationships for the selected equipment and provides an option for creating a new relationship if the equipment is not already fully constrained. An equipment part is fully constrained when it has sufficient defined relationships to prevent movement or rotation of the part along all three coordinate axes.

Positioning Relationships - Displays the available options for types of positioning relationships. Some options may not be available for all equipment types. See *Positioning Relationships: An Overview*, page 16 for more information.

Delete Relationship - Removes the selected relationship from the equipment model and the database. Using the **Relationships** list box, select a previously existing relationship for the equipment, and click **Delete Relationship**. You can use this command only when modifying existing equipment.

Equipment Component Reference - Prompts you for the reference on the equipment component to be placed that will be affected by the positioning relationship. In all cases, the part that you select in this step moves to create the relationship, and the part chosen in the **Second Part Reference** step remains fixed.

Second Part Reference - Prompts you for the reference on the equipment object or reference element already in the model that will be affected by the positioning relationship. After you select the reference, the software repositions the first equipment part chosen with respect to the second part selected in the definition of the relationship.

Offset - Defines the offset distance for a mate or align relationship. Offsets are disabled when establishing a connect relationship. You can adjust this value after initial equipment placement if needed.

Name - Displays the equipment name, as dictated by your predefined name rules, and accepts changes to that name.

Equipment - Specifies the equipment with which to associate the selected equipment component.

Related Topics
- *Place Equipment Component Command*, page 28
- *Place Equipment Component from the Catalog*, page 30
- *Placing Equipment Components from the Catalog: An Overview*, page 19

Place Equipment Component from the Catalog

1. Click **Place Equipment Component** on the vertical toolbar.

2. Select a piece of equipment to which to add the equipment component.

   💡 **Tip**

   - You can select the equipment in the **Workspace Explorer**, or in the model.

3. Select the equipment component to place from the **Select Equipment Component** dialog box, and click **OK**.

4. Click in a graphic view to select the mounting surface and approximate position for the equipment component.

   💡 **Tip**

   - You can press the left and right arrow keys to rotate the equipment component by 90-degree increments at any time during the placement of the equipment component. You can press the up arrow key to scroll through the three possible axes of rotation.

5. Using the **Place Equipment Component** ribbon, do any of the following, if necessary:

   - Set an offset for the equipment relationship by entering the distance in the **Offset** box.

   - Click **Properties** on the ribbon, and enter any necessary property information in the grid provided on the **Equipment Component Properties** dialog box.
     Edit Equipment Properties, page 93

   💡 **Tip**

   - You can view the definition properties of the equipment object using the **Properties** command within the **Select Equipment Component** dialog box on the equipment component property page after you place the equipment component. The occurrence properties for an equipment component object can be defined or modified after the equipment component object has been placed in the model.

6. If necessary, add or change a positioning relationship by selecting it from the **Relationship** dropdown list on the **Place Equipment Component** ribbon.

   Set Positioning Relationships for Equipment, page 27

   📝 **Note**

   - You cannot place equipment components with occurrence properties modeled using Solid Edge unless Solid Edge is installed on your

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computer. If you try to place such an object, the following dialog box appears:

⭐ Important

- As a workaround to the Solid Edge requirement, you can use the Bulkload utility with the flavors option. Plant designers can create dozens of variations for any equipment component part imaginable. Also, by creating several variations of a part, rather than using occurrence properties to create the variations automatically, designers can implement custom Solid Edge equipment component without having to install Solid Edge on every designer's computer.

  Each variation of a part represents some minor deviation from the catalog part, be it on the basis of size, operational specifications, or material. With Solid Edge, new variations can be created on the basis of size, while the software allows manipulation of the operating parameters or material of construction in the reference data. For more information on bulk loading with flavors, refer to the *SmartPlant 3D Reference Data Guide*, accessible from the **Help > Printable Guides** command in the software.

Related Topics
- *Place Equipment Component Command*, page 28
- *Place Equipment Component Ribbon*, page 28
- *Placing Equipment Components from the Catalog: An Overview*, page 19
- *Select Equipment Dialog Box*, page 21

Place Designed Equipment Command

Places equipment types that have been defined in the reference data. The properties of the equipment type you select are inherited by the designed equipment part. With the **Place Designed Equipment** command, you can define an equipment type, a system parent, name, and other property values as appropriate for theequipment type. Equipment position and orientation is further defined by mating, aligning, or connecting equipment graphics to reference graphics in the workspace, or by moving or rotating the equipment.

Related Topics
- *Place Designed Equipment Ribbon*, page 56
- *Place Designed Equipment*, page 59
- *Placing Equipment from the Catalog: An Overview*, page 15
- *Select Equipment Type Dialog Box*, page 58

Placing Designed Equipment: An Overview

The goal of the software's designed equipment component modeling capabilities is to allow you to build an equipment definition in the Model database by combining basic shapes, ports (nozzle, foundation, electrical, and so forth) and properties defined in the reference data. Designed equipment objects can be built entirely out of primitive geometric shapes, designed equipment components, or an existing equipment component part can be placed from the catalog to enhance the designed equipment object. For example, you can use the **Place Designed Equipment** command to create a designed equipment object in the model, add an agitator (using the **Place Shape** command), and then add nozzle primitives (using the **Place Nozzle** command) to customize the designed equipment. You can also place a nozzle using a nozzle defined in the P&ID design basis (if P&ID design basis data is available).

Some equipment shapes can be modeled more easily using solid modeling software. In addition to using the primitive shapes delivered with the software, you can import graphics from a SAT file as the geometry for the designed equipment shape. After the geometry is defined, you can then place ports to define distributed connections to the designed equipment.

As a further enhancement, the software provides a prismatic shape feature so that you can design uniquely customized shapes in the model. The place prismatic shape feature is made up of two distinct processes:

- Define a path.
- Define a cross section, or profile, to project along the path.

The ultimate goal of these two processes is placement of a shape in the model as part of a designed equipment object.

After a path and cross-section have been defined, the cross-section is then projected along the path to create a shape with the same properties as other equipment shapes.

Note

- The place prismatic shape feature is available on the **Occurrence** tab of the **Shape Properties** dialog box.

When you create a designed equipment object and add an equipment component object or shape, the default surface on the equipment component object or shape (as defined in Visual Basic) is automatically used to establish a mate or align relationship to the other surface or reference element you select during initial placement. When modifying a shape to create a new mate or align relationship, the default surface is not automatically used. You must interactively select the surface. For example, you might define the bottom of a pump as the default surface so that the software mates that surface to the floor. If the software cannot find a suitable mating surface for the

equipment, the equipment object is placed in free space, pending additional design of the structures or other reference elements.

When creating a designed equipment object, you can provide an optional offset distance from the surface. The default offset distance for any new piece of equipment is zero or the last offset used in the current session. The software maintains the offset relationship between the default surface and the surface or reference element in the workspace in the event of any changes to their position (for example, if a slab is lowered, then the equipment follows the slab, maintaining the offset). You can further define the equipment orientation by mating, aligning, or connecting equipment to other objects in the model, or by moving or rotating the designed equipment. For more information on positioning relationships, see *Positioning Relationships: An Overview*, page 16.

Related Topics
- *Creating Customized Shapes: An Overview*, page 34
- *Place a Nozzle*, page 68
- *Place a Shape*, page 66
- *Place Designed Equipment*, page 59
- *Set Positioning Relationships for Designed Equipment*, page 60

Creating Customized Shapes: An Overview

In the Equipment and Furnishings task, you can create customized shapes in the location that you need using the place prismatic shape feature. This feature is especially useful for designed equipment objects that need to have an unusual shape.

When you place a prismatic shape, a two-dimensional cross section is projected along a path that you specify in the model to create the shape. The path determines the actual location of the shape in the model. The cross section, on the other hand, defines the shape and its dimensions.

Defining Paths

When you define the path along which the cross section will be projected, you can choose from straight lines or arcs. You can also control all aspects of the path by specifying the types of turns that you need, the dimensions of the turns, and the plane for the path.
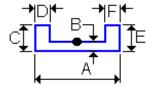
Defining Cross Sections

When you define the cross section for the shape, you can select from a standard set of cross sections, defined in the reference data, or you can sketch your own two-dimensional cross section.

When you use a standard cross-sectional type, you can change the dimensions and the cardinal point of the cross section on the **Cross-Section** tab of the **Shape Properties** or **Prismatic Shape Properties** dialog box. The cardinal point of the cross section is

important in determining the shape and location of the resulting volume. The cardinal point is the point where the software attaches the cross section to the path. All standard cross section types have various cardinal points from which you can choose.

For example, in the following graphic, you can see that the cardinal point is located in the center of the road cross section. If the cardinal point were moved to another location, the actual path of the roadway would be different.

When you sketch a cross section, you must sketch the cross section on the two-dimensional plane that is orthogonal to the first leg of the path. The software displays this plane, which is perpendicular to the path, as you sketch the cross section. The cardinal point is defined as you sketch. In other words, the cross section surrounds the path and is attached to the path exactly as you sketch it.

Related Topics
- *Define Cross-Sectional Properties for a Prismatic Shape*, page 42
- *Define the Path for a Prismatic Shape*, page 40
- *Place a Prismatic Shape*, page 39
- *Placing Designed Equipment: An Overview*, page 33
- *Sketch the Cross Section for a Prismatic Shape*, page 41

Place Prismatic Shape Ribbon

Sets options for placing shapes defined by a path and the cross section projected along the path.

Shape Properties - Displays the **Prismatic Shape Properties** dialog box, on which you can set properties for the shape that you need to place.

Path - Displays the **Create Path** ribbon, which defines the path along which the cross-section is projected.

Cross-Section - Sets properties for the cross section. If one of the standard cross-section types is selected in the **Cross-Section Type** box, this button is unavailable. If you select **Sketch** as the cross-section type, this button displays the **Create Path** ribbon to allow you to sketch the two-dimensional cross section. The **Cross-Section** button is only available after you define a path for the volume.

Finish - Places the shape along the path specified with the specified cross section.

Cross-Section Type -Specifies the type of cross section to project along the specified path. You can either select a standard cross section defined in the reference data, or you can sketch your own custom cross section.

Relationship List - Lists all relationships for the selected shape and provides an option for creating a new relationship if the object is not already fully constrained. An object is fully constrained when it has sufficiently defined relationships to prevent movement or rotation of the object along all three coordinate axes.

Positioning Relationships - Displays the available options for types of positioning relationships: Mate, Align, and Connect. Some options may not be available for all shape types. See *Positioning Relationships: An Overview*, page 16 for more information.

Delete Relationship - Removes the selected relationship from the model. Using the **Relationships List** box, select a previously existing relationship for the shape, and click **Delete Relationship**. You can use this command only when modifying existing designed equipment. This control is available only after a shape has been added to the designed equipment.

Shape Reference - Prompts you for the face of the shape to be placed that will be affected by the positioning relationship. In all cases, the part that you select in this step moves to create the relationship, and the part chosen in the **Second Part Reference** step remains fixed. This control is available only after a shape has been added to the designed equipment.

Second Part Reference - Prompts you for the reference on the shape object already in the model that will be affected by the positioning relationship. After you select the reference, the software repositions the first shape part chosen with respect to the second part selected in the definition of the relationship.

Offset - Defines the offset distance for a mate or align relationship. Offsets are disabled when establishing a connect relationship. You can adjust this value after initial placement if needed. This control is available only after a shape has been added to the designed equipment.

Name - Displays the shape name, as dictated by your predefined name rules, and accepts changes to that name.

Equipment - Specifies the designed equipment object with which to associate the selected shape.

Related Topics
- *Create Path Ribbon*, page 37
- *Creating Customized Shapes: An Overview*, page 34
- *Place a Prismatic Shape*, page 39

Create Path Ribbon

Sets options for defining a new path.

Sketch Properties - Displays the **Sketch Properties** dialog box, in which you can view properties for the path.

Finish Path - Displays the path in the active view and returns to the model with the place prismatic shape feature still enabled.

Cancel - Cancels the changes you made and returns you to the model.

Edit - Modifies and moves the existing path. When you initially create a path, this option is available only after you place at least two points in the path. You can select the segment, turn, or multiple segments to which to make modifications.

Create - Sketches the path or add segments to an existing path.

Reference Point - Specifies that you are currently defining the first point of the path segment.

End Point (Straight Line) - Specifies that you are currently defining the second point of a straight path segment.

End Point (Arc) - Specifies that you are currently defining the second point of an arc. This option appears only when **Arc** is selected in the **Line Type** list.

Third Point (Arc)- Specifies that you are defining the final point of an arc.

Path Type - Specifies the type of line for the current segment in the path. To change the segment type, click a new type in the **Line Type** list.

Line Type Options

Line - Defines the line type for the segment to be a straight line.

Arc by 3 Points - Defines the line type for the segment to be an arc. To define the arc, you must click three points in the view.

No Line - Specifies that you do not want the current segment of the path to have a line associated with it.

Plane - Activates options for selecting a working plane for the path.

Working Plane Options

Plan Plane - Defines the work surface as the XY plane.

Elevation Plane: East-West - Defines the work surface as the XZ plane.

Section Plane: North-South - Defines the work surface as the YZ plane.

⬚ **Plane by Turn** - Defines the work surface as the plane defined by an existing turn. You select the turn to set the plane.

▷ **Plane by Three Points** - Defines the work surface using three points that you define.

✳ **No Plane** - Clears any work surfaces. The software does not project points that you place to any plane.

🔒 **Lock Angle** -Locks or unlocks the **Angle** box. Locking the corresponding angle value creates a constraint along which the selected turn angle can be moved.

Angle -Specifies the angle for the turn.

🔒 **Lock Length** -Locks or unlocks the **Length** box.

Length -Specifies the length of the selected path segment.

Turn Type -Specifies the type of turn associated with the current path segment. The **Turn Type** option is unavailable if you select **Arc** or **No Line** in the **Line Type** list.
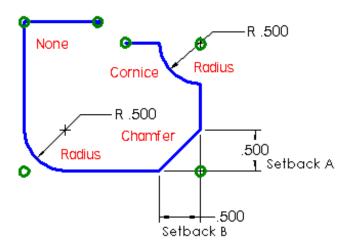
Turn Type Options

None - Indicates that no special turn type will be applied to the turn.

Bend - Specifies that the turn type between two segments is a bend. You can specify the angle of the bend in the **Feature Value** box.

Cornice - Specifies that the turn type between two segments is a cornice. You can specify the radius of the cornice in the **Feature Value** box.

The following graphic includes an example of each of the available turn types:

Turn Type Value -Defines dimensions for the selected turn type.

Related Topics
- *Define the Path for a Prismatic Shape*, page 40
- *Place a Prismatic Shape*, page 39
- *Sketch Properties Dialog Box*, page 118
- *Sketch the Cross Section for a Prismatic Shape*, page 41

Place a Prismatic Shape

1. Click **Place Shape** 🔥 on the vertical toolbar.

   🔵 **Important**

   - If a designed equipment object has not been selected, select one in a graphic view or in the **Workspace Explorer**.

2. On the **Shapes** dialog box, select the shape to place.

   💡 **Tip**

   - You can also click **More** on the dialog box to select a shape from the Catalog browser.

3. Click **Display Aspect** and select the aspects from the list.

   🔵 **Important**

   - You can click **Format > View** and change the **Render Selected Aspects** option in the **Format View** dialog box to display the aspect in the active graphic view.

4. Specify a name for the new shape in the **Name** box.

5. On the **Cross-Section** tab, select a cross section in the dropdown list. A corresponding image of the selected cross section appears at the bottom of the dialog box.

6. In the **Value** column, enter the appropriate geometric dimensions, cardinal point, and angle.

7. Click **OK** to return to the model.

8. Click **Path** ⊐ on the **Place Prismatic Shape** ribbon to define the path for the shape. For more information, see *Define the Path for a Prismatic Shape*, page 40.

9. Click **Finish Path** to finish the path.

10. Click **Finish** to place the new shape and save it to the database.

11. If necessary, add or change a positioning relationship by selecting it from the **Positioning Relationships** list.

Related Topics
- *Creating Customized Shapes: An Overview*, page 34
- *Occurrence Tab (Shape Properties Dialog Box)*, page 110
- *Place Prismatic Shape Ribbon*, page 35
- *Placing Designed Equipment: An Overview*, page 33

Define the Path for a Prismatic Shape

1. On the horizontal ribbon, set the **Locate Filter** box to **Shape**, and then select a prismatic shape.

    💡 **Tip**

    - If the **Locate Filter** box is not displayed on the horizontal ribbon, click the **Select Tool** ⇖ on the vertical toolbar.

2. On the **Place Prismatic Shape** ribbon, click **Path** ⇄.

3. Click **Create** on the ribbon.

4. Click the first point for the path.

    💡 **Tips**

    - You can use the **PinPoint** or **Point Along** commands, and the SmartSketch relationship indicators when defining your path.

    - You can change the plane for the path at any time by selecting the plane in the **Plane** list.

    - To change the segment from a straight line to an arc, click **Arc by 3 Points** ⌒ in the **Path Type** list, and then click three points to define the arc.

    - To switch back to a straight line after sketching an arc, click **Line** ╱ in the **Path Type** list.

    - To break the path, click **No Line** ⸴ in the **Path Type** list.

5. Click the second point for the path.

    💡 **Tips**

    - To change the turn type for the corner, click the new turn type in the **Turn Type** list and define the angle or dimensions for the turn in the **Turn Type Value** box.

    - The following graphic shows examples of the available turn types:

6. Click to place other segments of the path as needed.

7. After you place all the points that define the path, click **Finish Path**.

📝 Notes

- The software does not require that you close the path. When creating a continuous path, you can end it at any point.

- After you place a segment of the path by defining two points, you can click **Edit** on the ribbon to change the segment.

Related Topics
- *Add Segments to a Path*, page 47
- *Create Path Ribbon*, page 37
- *Creating Customized Shapes: An Overview*, page 34
- *Modify a Straight Segment in a Path*, page 49
- *Modify a Turn in a Path*, page 54
- *Modify an Arc in a Path*, page 51
- *Move Segments of a Path*, page 48
- *Place a Prismatic Shape*, page 39

Sketch the Cross Section for a Prismatic Shape
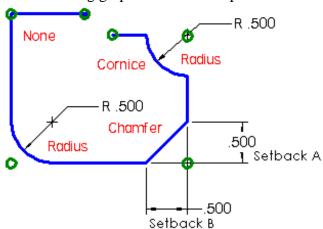
1. On the **Place Prismatic Shape** ribbon, select **Sketch** in the **Cross-Section** list.

2. Click **Cross-Section** ▭.

3. Click the first point for the cross section.

💡 Tips

- You must sketch the cross section on the two-dimensional plane that is orthogonal to the first leg of the path. Click **Show Cross Section** to display a window in the two-dimensional plane. The software displays this plane, which is perpendicular to the path, as you sketch the cross section.

- The cardinal point, which is the point where the cross section is attached to the path, is defined as you sketch. In other words, the cross section surrounds the path and is attached to the path exactly as you sketch it.

- To change the segment from a straight line to an arc, click **Arc by 3 Points** ⌒ in the **Path Type** list, and then click three points to define the arc.

- To switch back to a straight line after sketching an arc, click **Line** ╱ in the **Path Type** list.

4. Click the next point for the cross section.

Tips

- To change the turn type for the corner, click the new turn type in the **Turn Type** list and define the angle or dimensions for the turn in the **Turn Type Value** box.

- The following graphic shows examples of the available turn types:

5. Click to place other segments of the cross section as needed.

6. Click the starting point of the cross section to close it.

7. Click **Finish Path**.

Tip

- The **Finish Path** button is not available until you close the cross section by clicking the starting point.

Note

- After you place a segment of the cross section by defining two points, you can click **Edit** on the ribbon to change the segment.

Related Topics
- *Add Segments to a Path*, page 47
- *Create Path Ribbon*, page 37
- *Creating Customized Shapes: An Overview*, page 34
- *Edit Cross-Section Properties for a Prismatic Shape*, page 116
- *Modify a Sketched Cross Section*, page 44
- *Modify a Straight Segment in a Path*, page 49
- *Modify a Turn in a Path*, page 54
- *Modify an Arc in a Path*, page 51
- *Move Segments of a Path*, page 48
- *Place a Prismatic Shape*, page 39

Define Cross-Sectional Properties for a Prismatic Shape

1. On the horizontal ribbon, set the **Locate Filter** box to **Shape**, and then select a prismatic shape.
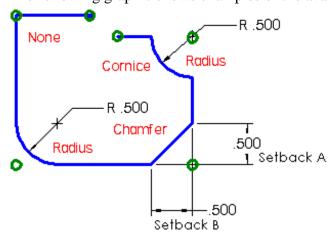
💡 **Tip**

- If the **Locate Filter** box is not displayed on the horizontal ribbon, click the **Select Tool** ⬚ on the vertical toolbar.
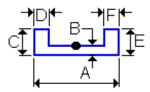
2. On the **Place Prismatic Shape** ribbon, select a cross-section type in the **Cross-Section Type** list.

💡 **Tip**

- If you select **Sketch** in the **Cross-Section Type** list, you must sketch the cross section using the **Path** commands before you can edit properties.

3. Click **Properties** 📄.

4. On the **Prismatic Shape Properties** dialog box, click the **Cross-Section** tab.

5. Define values for each dimension of the cross section. Letters such as A, B, and C represent the cross-sectional dimensions.

💡 **Tips**

- To see what each lettered dimension represents on the cross section, click **Display Cross-Section Image** ⬚ to view a graphic of the selected cross-sectional type if one exists in the reference data.

- Cross-sectional images show the dimensions that you can define for the cross-section type, the default cardinal points for the cross-section type, and the angle for the cross section. For example, the following graphic contains the dimensions and cardinal point for a standard road cross section.

- Not all cross-section types have images associated with them.

6. Select the cardinal point for the cross section in the **Cardinality** list.

💡 **Tips**

- The cardinal point is the point where the software attaches the cross section to the path.

- If you click **Display Cross-Section Image** ⬚ to see a graphic of the cross section, you can view where each cardinal point is located by selecting each cardinal point in the list.

7. Type an **Angle** for the cross section, if needed.

8. Click **OK**.

 Notes

- If you sketch a cross section, the properties for the cross section include the X-, Y-, and Z-coordinates, the turn type, and values for each point that define the cross-section path.

- You cannot modify the properties of a sketched cross section on the **Prismatic Shape Properties** dialog box. Instead, you must make changes to the path that defines the cross-section sketch. For more information, see *Modify a Sketched Cross Section*, page 44.

Related Topics
- *Creating Customized Shapes: An Overview*, page 34
- *Cross-Section Tab (Shape Properties Dialog Box)*, page 111
- *Edit Cross-Section Properties for a Prismatic Shape*, page 116
- *Place a Prismatic Shape*, page 39

Modify a Sketched Cross Section

1. Click **Select** .

2. On the horizontal ribbon, set the **Locate Filter** box to **Shape**, and then select a prismatic shape with a sketched cross section.

3. On the ribbon, click **Cross-Section** . The software outlines the cross-section path in yellow.

4. To modify a straight segment in the cross section, select the segment to modify, and then make changes on the ribbon.

    Modify a Straight Segment in a Path, page 49

5. To modify an arc in the cross section, select the arc to modify, and then make changes on the ribbon.

    Modify an Arc in a Path, page 51

6. To modify a turn in the cross section, select the turn to modify, and then make changes on the ribbon.

    Modify a Turn in a Path, page 54

7. To move a segment in the cross section, click the segment to move, and then click the point from which to move the segment and the point to which to move the segment.

    Move Segments of a Path, page 48

8. To add segments to the cross section, click **Create** on the ribbon, and then click to place the new segments.

    Add Segments to a Path, page 47

💡 **Tip**

- You can add as many segments to the cross-section as you need. However, you must close the cross-section to be able to save it.

9. To delete a segment in the cross section, select the segment to delete, and then click **Delete Selected Items** ✕.

10. Click **Finish Path**.

💡 **Tips**

- The **Finish Path** button is not available until you close the cross section by clicking the starting point.

- The new shape appears in dynamics when you click **Finish Path**.

- The new shape is actually created when you click **Finish** on the **Place Prismatic Shape** ribbon.

Related Topics
- *Add Segments to a Path*, page 47
- *Creating Customized Shapes: An Overview*, page 34
- *Edit Cross-Section Properties for a Prismatic Shape*, page 116
- *Modify a Sketched Cross Section*, page 44
- *Modify a Straight Segment in a Path*, page 49
- *Modify a Turn in a Path*, page 54
- *Modify an Arc in a Path*, page 51
- *Move Segments of a Path*, page 48

Edit Path Straight Segment Ribbon

Sets options for modifying a straight segment of an existing path.

📑 **Sketch Properties** - Displays the **Sketch Properties** dialog box, on which you can view properties for the path.

Finish Path - Displays the path in the active view and returns to the model with the place prismatic shape feature still enabled.

Cancel - Cancels the changes you made and returns you to the model.

Edit - Modifies and moves the existing path. You can select the segment, turn, or multiple segments to which to make modifications.

Create - Displays the **Create Path** ribbon to allow you to add segments to an existing path.

⤢ **Reference Point** - Specifies that you are selecting the starting location of the move vector.

⤢ **End Point** - Specifies that you are selecting the ending location of the move vector.

Path Type - Specifies the type of line for the current segment in the path. To change the segment type, click a new type in the **Line Type** list.

Path Type Options

Line - Defines the line type for the segment to be a straight line.

Arc by 3 Points - Defines the line type for the segment to be an arc. To define the arc, you must click three points in the view.

No Line - Specifies that you do not want the current segment of the path to have a line associated with it.

Plane - Activates options for selecting a working plane for the path.

Working Plane Options

Plan Plane - Defines the work surface as the XY plane.

Elevation Plane: East-West - Defines the work surface as the XZ plane.

Section Plane: North-South - Defines the work surface as the YZ plane.

Plane by Turn - Defines the work surface as the plane defined by an existing turn. You select the turn to set the plane.

Plane by Three Points - Defines the work surface using three points that you define.

No Plane - Clears any work surfaces. The software does not project points that you place to any plane.

Delete Selected Items - Deletes the selected path segments.

Length Locked - Defines whether or not the length of the selected segment should remain constant while moving.

When locked , the software automatically modifies the turn points, along with the length and angle of adjacent segment, to remain connected to the moved segment. The length of the moved segment does not change.

When not locked , the software extends or shortens the associated segments to connect with the new position of the moved segment. The length of the moved segment can change.

Related Topics
- *Creating Customized Shapes: An Overview*, page 34
- *Modify a Sketched Cross Section*, page 44
- *Modify a Straight Segment in a Path*, page 49
- *Modify a Turn in a Path*, page 54

Add Segments to a Path

1. Click **Select** ⬉.

2. On the horizontal ribbon, set the **Locate Filter** box to **Shape**, and then select a prismatic shape.

3. On the ribbon, click **Path** ⇄.

💡 **Tip**

- The software outlines the path in yellow.

4. To add one or more segments to the path, click **Create**.

5. Click the point on the existing path to insert the new segment.

💡 **Tips**

- You can use **PinPoint**, **Point Along**, and the SmartSketch relationship indicators when defining your path.

- You can change the plane for the path at any time by selecting the plane in the **Plane** list.

- To change the segment from a straight line to an arc, click **Arc by 3 Points** ⌒ in the **Path Type** list, and then click three points to define the arc.

- To switch back to a straight line after sketching an arc, click **Line** ╱ in the **Path Type** list.

- To break the path, click **No Line** ⋰ in the **Path Type** list.

6. Click to place other points and add to the path as needed.

💡 **Tip**

- To change the turn type for the corner, click the new turn type in the **Turn Type** list and define the angle or dimensions for the turn in the **Feature Value** box.

7. After you place all the points for the new segments, click **Finish Path**.

📝 **Notes**

- The software does not require that you close the path. You can end the path at any point.

- You can click **Edit** on the ribbon to change the segment or modify the path further.

- To manually set the length and angle for a segment of the path, change the values in the **Angle** and **Length** boxes on the ribbon.

Related Topics

Move Segments of a Path

1. Click **Select** .

2. On the horizontal ribbon, set the **Locate Filter** box to **Shape**, and then select a prismatic shape.

3. On the ribbon, click **Path** .

   💡 **Tip**

   - The software outlines the path in yellow.

4. Select the segments to move.

   💡 **Tip**

   - You can select multiple segments by holding the CTRL key and clicking the segments.

5. To keep the length of a straight segment constant while you move the segment, click **Length Locked** .

   💡 **Tips**

   - When the segment length is locked, the software automatically modifies the turn points, along with the length and angle of adjacent segment, to remain connected to the moved segment. The length of the moved segment does not change.

   - When the segment length is not locked, the software extends or shortens the associated segments to connect with the new position of the moved segment. The length of the moved segment can change.

6. Click to specify the starting location of the move vector.

7. Click to specify the ending location of the move vector.

8. Click **Finish Path**.

   💡 **Tips**

   - The new shape appears in dynamics when you click **Finish Path**.

   - The new shape is actually created when you click **Finish** on the **Place Prismatic Shape** ribbon.

   - While modifying several elements one at a time, you must use CTRL to select the next element, and then CTRL to de-select the previous element.

Related Topics

- *Add Segments to a Path*, page 47
- *Creating Customized Shapes: An Overview*, page 34
- *Edit Path Arc Ribbon*, page 50
- *Edit Path Straight Segment Ribbon*, page 45
- *Edit Path Turn Ribbon*, page 52
- *Modify a Straight Segment in a Path*, page 49
- *Modify a Turn in a Path*, page 54
- *Modify an Arc in a Path*, page 51
- *Move Segments of a Path*, page 48

Modify a Straight Segment in a Path

1. Click **Select** .

2. On the horizontal ribbon, set the **Locate Filter** box to **Shape**, and then select a prismatic shape.

3. On the ribbon, click **Path** .

   Tip

   - The software outlines the path in yellow.

4. Select the straight segment to modify.

   Tip

   - You can select multiple segments by holding CTRL and clicking the segments.

5. To change the line type for the segment, click a new type in the **Path Type** list.

6. To change the plane for the segment, click a new plane in the **Plane** list.

7. To delete the segment, click **Delete Selected Items** .

8. To keep the length of a straight segment constant when you move the segment, click **Length Locked** .

   Tips

   - When the segment length is locked, the software automatically modifies the turn points, along with the length and angle of adjacent segment, to remain connected to the moved segment. The length of the moved segment does not change.

   - When the segment length is not locked, the software extends or shortens the associated segments to connect with the new position of the moved segment. The length of the moved segment can change.

9. Click **Finish Path**.

   Tips

   - The new shape appears in dynamics when you click **Finish Path**.

- The new shape is actually created when you click **Finish** on the **Place Prismatic Shape** ribbon.

✎ Note

- You can also move the segments of a path. For more information, see *Move Segments of a Path*, page 48.

Related Topics
- *Add Segments to a Path*, page 47
- *Creating Customized Shapes: An Overview*, page 34
- *Edit Path Straight Segment Ribbon*, page 45
- *Modify a Straight Segment in a Path*, page 49
- *Modify a Turn in a Path*, page 54
- *Modify an Arc in a Path*, page 51
- *Move Segments of a Path*, page 48

Edit Path Arc Ribbon

Sets options for modifying an arc that is part of an existing path.

▣ **Sketch Properties** - Displays the **Sketch Properties** dialog box, on which you can view properties for the path.

Finish Path - Displays the path in the active view and returns to the model with the place prismatic shape feature still enabled.

Cancel - Cancels the changes you made and returns you to the model.

Edit - Modifies and moves the existing path. You can select the segment, turn, or multiple segments to which to make modifications.

Create - Displays the **Create Path** ribbon to allow you to add segments to an existing path.

⤢ **Reference Point** - Specifies that you are selecting the starting location of the move vector.

⤢ **End Point** - Specifies that you are selecting the ending location of the move vector.

Path Type - Specifies the type of line for the current segment in the path. To change the segment type, click a new type in the **Line Type** list.

Path Type Options

╱ **Line** - Defines the line type for the segment to be a straight line.

⌒ **Arc by 3 Points** - Defines the line type for the segment to be an arc. To define the arc, you must click three points in the view.

✎ **No Line** - Specifies that you do not want the current segment of the path to have a line associated with it.

Plane - Activates options for selecting a working plane for the path.

Working Plane Options

◇ **Plan Plane** - Defines the work surface as the XY plane.

⊡ᴇ **Elevation Plane: East-West** - Defines the work surface as the XZ plane.

⊡ᴺ **Section Plane: North-South** - Defines the work surface as the YZ plane.

▦ **Plane by Turn** - Defines the work surface as the plane defined by an existing turn. You select the turn to set the plane.

▷ **Plane by Three Points** - Defines the work surface using three points that you define.

✖ **No Plane** - Clears any work surfaces. The software does not project points that you place to any plane.

✕ **Delete Selected Items** - Deletes the selected path segments.

Related Topics
- *Creating Customized Shapes: An Overview*, page 34
- *Modify an Arc in a Path*, page 51

Modify an Arc in a Path

1. Click **Select** ↖.
2. On the horizontal ribbon, set the **Locate Filter** box to **Shape**, and then select a prismatic shape.
3. On the ribbon, click **Path** ⇄.

   💡 **Tip**

   - The software outlines the path in yellow.
4. Select the arc to modify.

   💡 **Tip**

   - You can select multiple segments by holding CTRL and clicking the segments.
5. To change the line type for the segment, click a new type in the **Path Type** list.
6. To change the plane for the segment, click a new plane in the **Plane** list.
7. To delete the segment, click **Delete Selected Items** ✕.
8. Click **Finish Path**.

Tips

- The new shape appears in dynamics when you click **Finish Path**.

- The new shape is actually created when you click **Finish** on the **Place Prismatic Shape** ribbon.

Note

- You can also move the segments of a path. For more information, see *Move Segments of a Path*, page 48.

Related Topics

- *Add Segments to a Path*, page 47
- *Creating Customized Shapes: An Overview*, page 34
- *Edit Path Arc Ribbon*, page 50
- *Modify a Straight Segment in a Path*, page 49
- *Modify a Turn in a Path*, page 54
- *Modify an Arc in a Path*, page 51
- *Move Segments of a Path*, page 48

Edit Path Turn Ribbon

Sets options for modifying a turn in an existing path.

Sketch Properties - Displays the **Sketch Properties** dialog box, on which you can view properties for the path.

Finish Path - Displays the path in the active view and returns to the model with the place prismatic shape feature still enabled.

Cancel - Cancels the changes you made and returns you to the model.

Edit - Modifies and moves the existing path. You can select the segment, turn, or multiple segments to which to make modifications.

Create - Displays the **Create Path** ribbon to allow you to add segments to an existing path.

Reference Point - Specifies that you are selecting the starting location of the move vector.

End Point - Specifies that you are selecting the ending location of the move vector.

Plane - Activates options for selecting a working plane for the path.

Working Plane Options

Plan Plane - Defines the work surface as the XY plane.

Elevation Plane: East-West - Defines the work surface as the XZ plane.

Section Plane: North-South - Defines the work surface as the YZ plane.

Plane by Turn - Defines the work surface as the plane defined by an existing turn. You select the turn to set the plane.

Plane by Three Points - Defines the work surface using three points that you define.

No Plane - Clears any work surfaces. The software does not project points that you place to any plane.

Delete Selected Items - Deletes the selected path segments.

Angle 1 - Displays the first angle used in the turn, if one exists. This option is read-only.

Angle 2 - Displays the second angle used in the turn, if one exists. This option is read-only.

Angle 3 - Displays the third angle used in the turn, if one exists. This option is read-only.

Turn Type -Specifies the type of turn. You can change the turn type by selecting another type in the list.

Turn Type Options

None - Indicates that no special turn type will be applied to the turn.

Bend - Specifies that the turn type between two segments is a bend. You can specify the angle of the bend in the **Feature Value** box.

Cornice - Specifies that the turn type between two segments is a cornice. You can specify the radius of the cornice in the **Feature Value** box.

Chamfer - Specifies that the turn type between two segments is a chamfer. You can specify the dimensions for setback A and setback B of the chamfer in the **Feature Value** box. The dimensions of setback A and setback B for the chamfer must be the same.

The following graphic includes an example of each of the available turn types:

Turn Type Value -Defines dimensions for the selected turn type.

Related Topics
- *Creating Customized Shapes: An Overview*, page 34
- *Modify a Sketched Cross Section*, page 44
- *Modify a Straight Segment in a Path*, page 49
- *Modify a Turn in a Path*, page 54

Modify a Turn in a Path

1. Click **Select** ⃗.

2. On the horizontal ribbon, set the **Locate Filter** box to **Shape**, and then select a prismatic shape.

3. On the ribbon, click **Path** ⊒.

   💡 **Tip**

   - The software outlines the path in yellow.

4. Select the turn to modify.

   💡 **Tip**

   - When the pointer passes over an object that contains multiple elements, use the **QuickPick** feature to help you select the specific element.

5. To change the plane for the segment, click a new plane in the **Plane** list.

6. To delete the turn, click **Delete Selected Items** ✕.

7. To change the turn type, select a new type in the **Turn Type** list.

8. To change the dimensions for the selected turn type, enter a value in the **Feature Value** box.

9. Click **Finish Path**.

💡 Tips

- The new shape appears in dynamics when you click **Finish Path**.
- The new shape is actually created when you click **Finish** on the **Place Prismatic Shape** ribbon.

✎ Note

- You can also move the segments of a path. For more information, see *Move Segments of a Path*, page 48.

Related Topics
- *Add Segments to a Path*, page 47
- *Creating Customized Shapes: An Overview*, page 34
- *Edit Path Turn Ribbon*, page 52
- *Modify a Straight Segment in a Path*, page 49
- *Modify a Turn in a Path*, page 54
- *Modify an Arc in a Path*, page 51
- *Move Segments of a Path*, page 48

Place Designed Equipment Ribbon

Sets options for adding designed equipment to your model. This ribbon appears automatically after you select the **Place Designed Equipment** command and then select an equipment type. Until a shape has been added to the designed equipment, only the **Equipment Properties**, **Equipment Name**, and **Active System** controls are available.

Tips

- To find out the name of an option on the ribbon, pause the pointer over an option and read the ToolTip.

- To add a shape to the designed equipment and enable the remaining ribbon controls, select the **Place Shape** command.

Equipment Properties - Edits the occurrence properties and review the static properties of an existing piece of equipment. Equipment properties can be edited only after the designed equipment is placed in the model.

Relationship List - Lists all relationships for the selected designed equipment and provides an option for creating a new relationship if the equipment is not already fully constrained. An equipment object is fully constrained when it has sufficient defined relationships to prevent movement or rotation of the object along all three coordinate axes. This control is only available after a shape has been added to the designed equipment.

Positioning Relationships - Displays the available options for types of positioning relationships: Mate, Align, Connect Minimum Distance, Mate to Tangent Plane, and Parallel. Some options may not be available for all designed equipment types. See *Positioning Relationships: An Overview*, page 16 for more information.

Delete Relationship - Removes the selected relationship from the equipment model and the database. Using the **Relationships List** box, select a previously existing relationship for the designed equipment, and click **Delete Relationship**. You can use this command only when modifying existing designed equipment. This control is available only after a shape has been added to the designed equipment.

Equipment Reference - Prompts you for the reference on the designed equipment to be placed that will be affected by the positioning relationship. In all cases, the part that you select in this step moves to create the relationship, and the part chosen in the **Second Part Reference** step remains fixed.

Second Part Reference - Prompts you for the reference on the equipment object or reference element already in the model that will be affected by the positioning relationship. After you select the reference, the software repositions the first designed equipment object chosen with respect to the second object selected in the definition of

the relationship. This control is available only after a shape has been added to the designed equipment.

Offset - Defines the offset distance for a mate or align relationship. Offsets are disabled when establishing a connect relationship. You can adjust this value after initial equipment placement if needed. This control is available only after a shape has been added to the designed equipment.

Name - Displays the designed equipment name, as dictated by your predefined name rules, and accepts changes to that name.

System - Specifies the system with which to associate the selected equipment. The default system is the plant itself.

Related Topics
- *Place Designed Equipment Command*, page 32
- *Place Shape Command*, page 65
- *Placing Designed Equipment: An Overview*, page 33

Select Equipment Type Dialog Box

Selects the type of designed equipment to be created. This dialog box appears automatically when you click the **Place Designed Equipment** command. By browsing through the part hierarchy, you can find any piece of equipment in the Catalog database. The resulting designed equipment inherits the properties of the existing equipment type you select from the dialog box. After you select an equipment type, the software returns you immediately to the model, where you can finish configuring the object.

Back - Returns you to the previously selected equipment type or node. Use this command to navigate through the equipment hierarchy to the specific type you need.

Forward - Sends you to the last selected equipment type or node that you moved away from by using the **Back** button. Use this command to navigate through the equipment hierarchy to the specific type you need.

Up One Level - Brings up the next highest level of the Equipment catalog hierarchy. Use this command to navigate through the equipment hierarchy to the specific type you need.

Properties - Displays the properties of the selected object. Because you cannot modify any properties until the equipment is placed, all properties on the **Properties** dialog box are read-only.

Preview - Displays a bitmap symbol of the selected equipment. The image file must be assigned to the equipment in the catalog reference data.

List View - Sets the dialog box to display equipment in a list view.

Grid View - Sets the dialog box to display equipment in a spreadsheet-style grid view.

Address - Specifies your exact location within the displayed hierarchy.

Related Topics
- *Place Designed Equipment Command*, page 32
- *Place Designed Equipment*, page 59
- *Placing Designed Equipment: An Overview*, page 33

Place Designed Equipment

1. Click **Place Designed Equipment** on the vertical toolbar.

2. On the **Select Equipment Type** dialog box, select the designed equipment type to create.

   🔷 Important

   - The **Select Equipment Type** dialog box displays the existing equipment classifications as defined in the Catalog database. The resulting designed equipment object inherits the properties of the equipment type you select.

3. Click **OK**. A definition of the new designed equipment object is created in the Model database and appears in the system hierarchy in the **Workplace Explorer**.

4. Place a data point in the model to define the origin of the equipment.

5. If necessary, you can use the **Place Designed Equipment** ribbon to do the following:

   - Choose a system with which to associate the new designed equipment object from the options in the **System** box.

   - Type a name for the new designed equipment object in the **Name** box.

📝 Note

- Although the new designed equipment object is added to the **Workspace Explorer**, you must use the **Place Shape** command to create geometry for the object.

Related Topics
- *Place Designed Equipment Command*, page 32
- *Place Designed Equipment Ribbon*, page 56
- *Placing Designed Equipment: An Overview*, page 33

Set Positioning Relationships for Designed Equipment

1. Select the designed equipment object for which to define a relationship.

2. In the **Relationships List** box on the **Place Designed Equipment** ribbon, choose **<New Relationship>**.

3. Select one of the available positioning relationships in the **Positioning Relationships List** box and follow the on-screen prompts. For more information, see *Positioning Relationships: An Overview*, page 16.

Note

- Depending on the type of positioning relationship defined in the previous step, surfaces or points need to be defined to finish configuring the relationship.

Related Topics
- *Place Designed Equipment*, page 59
- *Placing Designed Equipment: An Overview*, page 33

Place Designed Equipment Component Command

Specifies any equipment component from the Equipment Components folder of the catalog and places an occurrence of it inside the model. You can modify the offset of the component, its relationships to other equipment, and other properties during or after placement. Using positioning relationships, the **Place Designed Equipment Component** command allows you to mate, connect, or align equipment components, and you can use common tools like the **PinPoint** command for precise positioning of the component.

Related Topics
- *Place Designed Equipment Component Ribbon*, page 62
- *Place Designed Equipment Component*, page 64
- *Placing Designed Equipment Components: An Overview*, page 61
- *Select Equipment Dialog Box*, page 21

Placing Designed Equipment Components: An Overview

The goal of the software's designed equipment component modeling capabilities is to allow you to build an equipment component definition in the Model database by combining basic shapes, ports (such as nozzles, foundations, electrical, and so on) and properties defined in the reference data. Designed equipment component objects can be built entirely of primitive geometric shapes. For example, you can use the **Place Designed Equipment Component** command to create a designed equipment component object in the model, add lugs (using the **Place Shape** command) to customize the designed equipment component. You can also place a nozzle using a nozzle defined in the P&ID design basis (if P&ID design basis data is available).

Some equipment component shapes can be modeled more easily using solid modeling software. In addition to using the primitive shpaes delivered with the software, you can import graphics from a SAT file as the geometry for the designed equipment shape. After the geometry is defined, you can then place ports to define distributed connections to the designed equipment.

Related Topics
- *Place Designed Equipment Component Command*, page 61
- *Place Designed Equipment*, page 59
- *Positioning Relationships: An Overview*, page 16
- *Rotating Equipment: An Overview*, page 79
- *Select Equipment from the Catalog*, page 24
- *Set Positioning Relationships for Equipment*, page 27

Place Designed Equipment Component Ribbon

Sets options for adding designed equipment components to your model. This ribbon appears automatically after you select the **Place Designed Equipment Component** command and then select an equipment object, or when you select an existing equipment component.

Tip

- To find out the name of an option on the ribbon, pause the pointer over an option and read the ToolTip.

Equipment Component Properties - Edits the occurrence properties and reviews the static properties of an existing equipment component. Equipment components properties can be set and edited only after an equipment component object is placed in the model.

Note

- Any object modeled in Solid Edge that has occurrence properties cannot be placed or modified unless you computer has a copy of Solid Edge installed.

Relationship List - Lists all relationships for the selected equipment component and provides an option for creating a new relationship if the equipment component is not already fully constrained. An equipment component part is fully constrained when it has sufficient defined relationships to prevent movement or rotation of the part along all three coordinate axes.

Positioning Relationships - Displays the available options for types of positioning relationships. See *Positioning Relationships: An Overview*, page 16 for more information.

Delete Relationship - Removes the selected relationship from the equipment component model and the database. Using the **Relationships** list box, select a previously existing relationship for the equipment component, and click **Delete Relationship**. You can use this command only when modifying existing equipment components.

Equipment Component Reference - Prompts you for the reference on the equipment component to be placed that will be affected by the positioning relationship. In all cases, the part that you select in this step moves to create the relationship, and the part chosen in the **Second Part Reference** step remains fixed.

Second Part Reference - Prompts you for the reference on the equipment component object or reference element already in the model that will be affected by the positioning relationship. After you select the reference, the software repositions

the first equipment component part chosen with respect to the second part selected in the definition of the relationship.

Offset - Defines the offset distance for a mate or align relationship. Offsets are disabled when establishing a connect relationship. You can adjust this value after initial equipment component placement if needed.

Name - Displays the equipment component name, as dictated by your predefined name rules, and accepts changes to that name.

Equipment - Specifies the equipment with which to associate the selected equipment component.

Related Topics
- *Place Designed Equipment Component Command*, page 61
- *Place Designed Equipment Component*, page 64
- *Placing Designed Equipment Components: An Overview*, page 61

Place Designed Equipment Component

1. Click **Place Designed Equipment Component** 📐 on the vertical toolbar.

2. Select a piece of designed equipment to which to add the equipment component.

   💡 **Tip**

   - You can select the designed equipment in the **Workspace Explorer**, or in the model.

3. Select the equipment component to place from the **Select Equipment Component** dialog box, and click **OK**.

4. Click in a graphic view to define the position of the equipment component.

5. Using the Place Designed Equipment Component ribbon, do any of the following, if necessary:

   - Set an offset for the equipment relationship by entering the distance in the **Offset** box.

   - Click **Properties** 🖼 on the ribbon, and enter any necessary property information in the grid provided on the **Equipment Component Properties** dialog box.

     Edit Equipment Properties, page 93

   💡 **Tip**

   - You can view the definition properties of the equipment object using the **Properties** command within the **Select Equipment Component** dialog box on the equipment component property page after you place the equipment component. The occurrence properties for an equipment component object can be defined or modified after the equipment component object has been placed in the model.

6. If necessary, add or change a positioning relationship by selecting it from the **Relationship** dropdown list on the **Place Equipment Component** ribbon.

   Set Positioning Relationships for Equipment, page 27

   Related Topics
   - *Place Designed Equipment Component Command*, page 61
   - *Place Designed Equipment Component Ribbon*, page 62
   - *Placing Designed Equipment Components: An Overview*, page 61
   - *Select Equipment Dialog Box*, page 21

Place Shape Command

🔥 Adds additional shapes to an existing equipment or equipment component type. The **Place Shape** command uses the equipment or equipment component object selected in the **Workspace Explorer** hierarchy. If no equipment or equipment component object is selected prior to starting the command, you are prompted to select an equipment or equipment component object.

Related Topics
- *Place a Shape*, page 66
- *Placing Designed Equipment: An Overview*, page 33

Place Shape Ribbon

Sets options for positioning the specific shape as part of a selected designed equipment object.

Positioning Relationship - Displays the available options for types of positioning relationships: Mate, Align, and Connect. Some options may not be available for all shape types. For more information, see *Positioning Relationships: An Overview*, page 16.

🔻 **Delete Relationship** - Removes the selected relationship from the model. Using the **Relationships List** box, select a previously existing relationship for the shape, and click **Delete Relationship**. You can use this command only when modifying existing shapes. This control is available only after a shape has been added to the equipment or equipment component.

🔷 **Shape Reference** - Prompts you for the reference on the shape to be placed that will be affected by the positioning relationship. In all cases, the part that you select in this step moves to create the relationship, and the part chosen in the **Second Part Reference** step remains fixed.

🔷 **Second Part Reference** - Prompts you for the reference on the shape object already in the model that will be affected by the positioning relationship. After you select the reference, the software repositions the first shape chosen with respect to the second part selected in the definition of the relationship.

Offset - Defines the offset distance for a mate or align relationship. Offsets are disabled when establishing a connect relationship. You can adjust this value after initial equipment placement if needed. This control is only available after a shape has been added to the designed equipment.

Name - Displays the shape name, as dictated by your predefined name rules, and accepts changes to that name.

Equipment - Specifies the equipment or equipment component object with which to associate the selected shape.

Related Topics
- *Place a Shape*, page 66
- *Place Shape Command*, page 65
- *Placing Equipment from the Catalog: An Overview*, page 15

Place a Shape

1. Click **Place Shape** ⬧ on the vertical toolbar, and hold down a few seconds to display the floating **Shapes** palette. Select the shape to place from the **Shapes** dialog box. The icon of the last used shape displays on the toolbar.

   ⬥ **Important**

   - If an equipment or an equipment component object has not been selected, you are prompted to select one. Do this either in a graphic view or in the system hierarchy in the **Workspace Explorer**.

2. If necessary, make adjustments on the **Shape Properties** dialog box, and click **OK**.

3. Click in the graphic view to select an approximate location or reference element for a relationship for the shape.

   📝 **Notes**

   - You can continue using the **Place Shape** ⬧ command to combine geometric shapes and create customized equipment or equipment component objects.

   - After a shape has been placed in the model as part of the equipment or equipment component object, you can use the horizontal ribbon to add or change the positioning relationship.

   - You can press the left or right arrow keys to rotate the shape by 90-degree increments at any time during the placement of the shape. Press the up arrow to scroll through the three possible axes of rotation.

   Related Topics
   - *Place Shape Command*, page 65
   - *Placing Designed Equipment: An Overview*, page 33

Place Nozzle Command

Adds different types of ports to an equipment or equipment component object. You can specify port location details and properties, including port type. The ability to add ports to an equipment object is required to connect equipment to distributed systems, such as conduit, HVAC, piping, and cable.

Related Topics
- *Place a Nozzle*, page 68
- *Placing Designed Equipment: An Overview*, page 33

Place Nozzle Ribbon

Sets options for defining port properties and selecting the shape object with which the port is associated.

Nozzle Properties - Displays the dynamic occurrence properties so that you can review the static properties of any port attached to an existing shape.

Port/Nozzle Parent - Specifies the parent (which can be a shape, equipment or an equipment component by way of their coordinate system) with which the port is associated.

Related Topics
- *Place Nozzle Command*, page 67
- *Placing Equipment from the Catalog: An Overview*, page 15

Place a Nozzle

1. Click **Place Nozzle** 🐚 on the vertical toolbar.

2. Select the parent to which to add a nozzle.

   💡 **Tip**

   - You can either select the parent in a graphic view, or you can select it in the **Workplace Explorer**.

3. On the **Occurrence** tab, select the type of nozzle to place from the **Port Type** list.

   💡 **Tip**

   - If you select the **PipePort (No Added Graphic)** or **HvacPort (No Added Graphic)** type, see the **Note** section following this procedure for information regarding its placement.

4. In the **Value** grid, enter values for the listed properties. You can use the **From catalog** button to prepopulate values from predefined catalog nozzles. Values can be overridden after selection of predefined values.

5. Click the **Location** tab, and select a placement type from the **Placement Type** list box.

6. In the **Value** grid, enter the values for the listed properties.

   💡 **Tip**

   - These location properties are dimensions relative to the selected parent.

7. Click **OK**. The **Nozzle Properties** dialog box closes and you return to the model with the nozzle placed, unless the **Placement Type** selected is **Position by Plane and Axis** or **Position by Point**. In this case, additional steps are required to place the nozzle in the model.

   📝 **Notes**

   - The **PipePort (No Added Graphic)** or **HvacPort (No Added Graphic)** port type is a special implementation of a piping straight nozzle that is used to add a nozzle port to an existing graphic. Equipment objects imported with the **Place Imported Shape from File** command may have a graphic representation of a nozzle, but no nozzle port. The **PipePort (No Added Graphic)** or **HvacPort (No Added Graphic)** nozzle type, which has all the standard piping port properties but not the graphics of the piping nozzle, allows you to add a nozzle port (represented as a circular surface) to the existing shape. After selecting **PipePort (No Added Graphic)** or **HvacPort (No Added Graphic)**, the software prompts you to graphically locate the port in the model by selecting a surface and a cylinder (cone) to define a position and an axis.

- You can press the left or right arrow keys to rotate the nozzle by 90-degree increments at any time during the placement of the nozzle. Press the up arrow to scroll through the three possible axes of rotation.

Related Topics
- *Place Designed Equipment*, page 59
- *Place Nozzle Command*, page 67
- *Placing Designed Equipment: An Overview*, page 33

Place a Nozzle from a P&ID

1. Click **Framework > Retrieve** to retrieve the P&ID that contains the nozzle to place. You can skip this step if the P&ID has already been retrieved.

2. Click **Framework > View P&ID** to view the P&ID that contains the nozzle to place.

3. In the P&ID, select the nozzle to place in the model.

4. Click **Place Nozzle** on the vertical toolbar.

5. Select the equipment or designed equipment object on which to place the nozzle.

   Tip

   - You can either select the shape in a graphic view, or you can select it in the **Workplace Explorer**.

6. On the **Nozzle Properties** dialog box, verify that the property values defined on the **Occurrence** tab are correct as compared to the nozzle report.

7. On the **Location** tab, specify the placement type and enter values for the location parameters as needed.

8. Click **OK**. The **Nozzle Properties** dialog box closes and you return to the model with the nozzle placed.

9. Click **Framework > Compare Design Basis**, and verify the correlation status of the nozzle in the model.

10. If necessary, click **Update** to transfer data in the P&ID to match the 3-D model object.

Notes

- The software automatically sets all mapped nozzle properties in the 3-D model as defined by the currently selected P&ID nozzle.

- After the nozzle is placed in the 3-D model, it can be moved without affecting the correlation. If it is deleted, it does not delete the P&ID design basis object.

- Correlation is a relationship between an object in the 3-D model and the corresponding object in the P&ID. For example, a nozzle in the 3-D model is related to a nozzle in the P&ID.

- The occurrence properties of the nozzle object in the 3-D model that are not correlated with corresponding properties in the design basis object (that is, the nozzle in the P&ID) can be edited without changing the correlation status.

Related Topics
- *Location Tab (Nozzle Properties Dialog Box)*, page 123
- *Nozzle Properties Dialog Box*, page 119
- *Place Designed Equipment*, page 59
- *Place Nozzle Command*, page 67
- *Placing Designed Equipment: An Overview*, page 33

Place Imported Shape from File Command

 Adds geometry to a designed equipment object that was modeled with solid modeling software and saved to a SAT file format to an equipment or equipment component object. The **Place Imported Shape from File** command uses the equipment or equipment component object selected in the **Workspace Explorer** hierarchy. If no equipment or equipment component object is selected prior to selecting the command, you are prompted to select an equipment or equipment component object.

Related Topics
- *Place a Shape*, page 66
- *Placing Designed Equipment: An Overview*, page 33

Select Shape File Dialog Box

Specifies the SAT file that contains the geometry to import as the shape. This dialog box appears automatically when you click the **Place Imported Shape from File** command. You can navigate through the available file systems to locate the appropriate file. Selecting a SAT file displays the **Display Aspects** dialog box where you select the aspect the imported shape will represent. The software then returns you immediately to the model, where you can finish configuring and placing the imported shape.

 Note

- The **Select Shape File** dialog box is a standard Microsoft Windows dialog box. For information regarding how to use the dialog box, click the question mark **?** in the upper right corner and then click a control on the dialog box.

Related Topics
- *Place Designed Equipment*, page 59
- *Place Imported Shape from File Command*, page 71
- *Placing Designed Equipment: An Overview*, page 33

Place an Imported Shape

1. Click **Place Imported Shape from File** 🖼 on the vertical toolbar.

   🛑 **Important**

   - If an equipment or equipment component object has not been selected, select one in a graphic view or in the **Workspace Explorer**.

2. In the **Select Shape File** dialog box, navigate to and select the SAT file that contains the shape to insert. Click **OK**.

3. In the **Display Aspect** list box, select the aspects from the list.

   🛑 **Important**

   - You can click **Format > View** and change the **Render Selected Aspects** option in the **Format View** dialog box to display the aspect in the active graphic view.

4. Click **OK**. The list box closes and you return to the model.

5. Click in the graphic view to select an approximate location or reference element for a relationship for the shape.

   📝 **Notes**

   - After a shape has been placed in the model as part of the equipment or equipment component object, you can use the horizontal ribbon to add or change the positioning relationship.

   - You can add port definitions with the **Place Nozzle** 🔩 command to complete the equipment or equipment component definition.

   Related Topics
   - *Place Imported Shape from File Command*, page 71
   - *Place Nozzle Command*, page 67
   - *Placing Designed Equipment: An Overview*, page 33

Replace Equipment Command

Exchanges a selected equipment or equipment component in the model for a different item from the catalog.

Related Topics
- *Place Equipment from the Catalog*, page 25
- *Place Equipment Ribbon*, page 22
- *Placing Equipment from the Catalog: An Overview*, page 15
- *Replace Equipment*, page 73
- *Select Equipment Dialog Box*, page 21

Replace Equipment

1. Select the equipment, or equipment component, to replace.

2. Click **Replace Equipment** on the vertical toolbar.

3. Select the equipment to use in place of the selected item from the **Select Equipment** dialog, and click **OK**.

   Select Equipment from the Catalog, page 24

Related Topics
- *Place Equipment Command*, page 15
- *Place Equipment Ribbon*, page 22
- *Placing Equipment from the Catalog: An Overview*, page 15
- *Replace Equipment Command*, page 73
- *Select Equipment Dialog Box*, page 21

Move Command

Moves equipment objects from one location to another. You can specify locations by clicking in a graphic view or by entering values on the ribbon. You can move one or more equipment objects at a time.

Note

- To move an individual shape, select the shape and not the designed equipment object.

Related Topics
- *Move Equipment with Precision Points*, page 78
- *Move Equipment with the Select Tool*, page 77
- *Moving Equipment: An Overview*, page 75

Moving Equipment: An Overview

At any time while working in the Equipment and Furnishings task, you can move equipment objects that have been placed in the model to other locations in the model. You can move equipment one piece at a time, or you can select multiple equipment objects and move them collectively. The software will maintain persistent relationships that exist between objects during a move. For example, if a pump has been mated to a surface, that relationship will continue to exist even after the pump is moved to another location within the model. Shapes, equipment objects, and ports added to an equipment object will move as a rigid body when the equipment object is manipulated as a whole.

You can move equipment objects in the model using either one of the following methods:

* Dragging and dropping equipment objects with the **Select Tool** .

* Specifying precision points with the **Move** command.

Use the Select Tool

Dragging objects with the **Select Tool** is perhaps the easiest method of moving equipment from one place to another. To do so, select an equipment object, drag it to another area within the model, and then release the mouse button to drop it in the new location. For more information, see *Move Equipment with the Select Tool*, page 77.

Use Precision Points

By defining *Move From* and *Move To* points, very precise movement of equipment objects is possible. For more information, see *Move Equipment with Precision Points*, page 78.

Related Topics
* *Move Equipment with Precision Points*, page 78
* *Move Equipment with the Select Tool*, page 77

Move Ribbon

Specifies the *move from point* and *move to point* when you move an equipment object.

💡 **Tip**

- To find out the name of an option on the ribbon, pause the pointer over an option and read the ToolTip.

Move From - Defines the point of origin for moving the selected equipment object. This point serves as a fixed anchor during the move.

Move To - Defines the destination point for the selected equipment object.

Plane - Activates options for selecting a working plane for the move operation. The icon in the ribbon changes depending on your selection. The options include:

No Plane - Does not restrict movement to a plane.

Plan - Defines the work surface as the XY plane.

Elevation - Defines the work surface as the XZ plane.

Section - Defines the work surface as the YZ plane.

Name - Displays the name of the object selected.

System - Displays the parent system for the object selected.

Related Topics
- *Move Command*, page 74
- *Move Equipment with Precision Points*, page 78
- *Move Equipment with the Select Tool*, page 77
- *Moving Equipment: An Overview*, page 75

Move Equipment with the Select Tool

1. On the vertical toolbar, click the **Select Tool** .

2. Select the equipment object to move.

   Tip

   - To select more than one equipment object, hold CTRL as you click each object.

3. Drag the equipment object to its new location.

   Note

   - When the **Select Tool** is active, selectable objects highlight as you pass the pointer over them. When the object that you want to select is highlighted, click to select it.

   - Persistent relationships (for example, an equipment base mated to a surface) are maintained when moving equipment objects with the **Select Tool**.

   Related Topics
   - *Move Equipment with Precision Points*, page 78
   - *Moving Equipment: An Overview*, page 75
   - *Place Designed Equipment*, page 59
   - *Placing Equipment from the Catalog: An Overview*, page 15

Move Equipment with Precision Points

1. Select one or more equipment objects.

   💡 **Tip**

   - To select multiple objects, hold CTRL as you click each object.

2. On the horizontal toolbar, click **Move.** ⊕

3. Click in a graphic view to define the *move from* point. By default, this is the location that the equipment was in when you started the command.

4. Click in a graphic view to define the *move to* point.

📝 **Notes**

- If only one equipment object is selected, the point of origin defaults to the current position of the selected object.

- When you move an equipment object, the **Move To** point becomes the next **Move From** point.

- The software maintains relationships within the select set if they are still applicable after you have moved the objects.

- Though it does not offer the same level of precision, you can also use drag and drop to move equipment objects. Select the objects, and then drag them to their new location and drop them.

Related Topics
- *Move Equipment with Precision Points*, page 78
- *Moving Equipment: An Overview*, page 75
- *Place Designed Equipment*, page 59
- *Placing Equipment from the Catalog: An Overview*, page 15

Rotate Equipment Command

Repositions equipment by rotating along a universal axis defined for the model view as well as an occurrence axis unique to the equipment itself. By defining **Angle** and **Step** values, very precise rotations are possible. You can either select an object to rotate and then select the command, or select the command and then select the object to rotate. You can rotate equipment at any time.

Related Topics
- *Rotate Equipment Ribbon*, page 80
- *Rotate Equipment*, page 81
- *Rotating Equipment: An Overview*, page 79

Rotating Equipment: An Overview

The **Rotate Equipment** command turns a piece of equipment about an axis. You can either select an object to rotate and then select the command, or you can select the command and then select the object to rotate. You can rotate equipment at any time, as long as the equipment is not fully constrained.

If you placed the equipment with a mate relationship to a surface, you can only rotate the equipment about the axis that is normal to the surface. When you start the command, the software selects this axis by default. If the equipment has more than one constraint, you cannot rotate it. The default point of rotation is the first foundation port of the equipment. If no foundation port exists, the origin becomes the default point of rotation.

The axis of rotation is one of the axes of the current PinPoint coordinate system, one of the equipment's local coordinate system axes, a foundation port axis, or a nozzle axis. You can either enter a value in the **Angle** box to define the rotation or you can drag around the axis of rotation. This action causes the object to rotate dynamically about the axis, with a corresponding dynamic update of the **Angle** box. When rotating an object, you can also specify a **Step** value that represents the incremental angle value used by the software in rotating the piece of equipment.

Related Topics
- *Editing Properties and Relationships: An Overview*, page 82
- *Placing Designed Equipment: An Overview*, page 33
- *Placing Equipment from the Catalog: An Overview*, page 15
- *Rotate Equipment*, page 81

Rotate Equipment Ribbon

Sets options for rotating equipment in the model. You cannot rotate equipment along an axis that is constrained by predefined positioning relationships, and you cannot rotate equipment that is fully constrained. For example, you cannot rotate a pump that is mated to a horizontal reference plane and aligned with other pumps on either side, because in order to perform the rotation, one or more of these relationships would be broken.

💡 **Tip**

- To find out the name of an option on the ribbon, pause the pointer over an option and read the ToolTip.

Rotation Point - Defines the origin point for the rotation of a piece of equipment. This point serves as a fixed anchor during the rotation.

Axes - Sets the geometrical axes to reference during the rotate operation. You can choose from the equipment's local coordinate system, the global coordinate system for the entire model, or any grid systems defined for the model.

Reference on Part - Instructs the system to use the selected part face or edge as the rotation reference, and selects the equipment's local coordinate system for the rotation of the part.

Reference on Model - Defines a reference in the model, and selects the global coordinate system for the rotation of the part.

Angle - Specifies the angle of rotation for the equipment. This option also dynamically displays the current angle during manual rotation.

Step - Defines an incremental value to use when rotating equipment. When you rotate equipment manually, the equipment only rotates to an angle equal to some multiple of the step value.

Close - Exits the command.

Related Topics
- *Rotate Equipment Command*, page 79
- *Rotate Equipment*, page 81

Rotate Equipment

1. Select the piece of equipment to rotate.

2. Click **Rotate Equipment** 🗘 on the vertical toolbar.

3. In the **Axes** box, select the axis, if necessary.

4. Enter the incremental angle value needed in the **Step** box.

5. Specify the angle at which to rotate the equipment in the **Angle** box.

6. Click **Close** to exit the command.

📝 Notes

- The equipment object can also be rotated dynamically by dragging. When using this method, the **Angle** box will update dynamically as the equipment position is changed.

- You can press F11 to rotate a shape by 90-degree increments at any time during placement of the shape.

Related Topics
- *Editing Properties and Relationships: An Overview*, page 82
- *Rotate Equipment Command*, page 79
- *Rotating Equipment: An Overview*, page 79

Editing Properties and Relationships: An Overview

After you have placed an equipment object in the model, it may be necessary to adjust its properties or its relationships with other objects in the model. The Equipment and Furnishings task provides you with the flexibility to make design changes at any point in the design process.

All items that compose an equipment object have properties that you can edit. Using the **Select** command on the vertical toolbar, you select the object to edit. An important part of the **Select** command is the **Locate Filter** box that appears on the ribbon.

The **Locate Filter** box contains the available, pre-defined filters for the **Select** command. When you choose a filter in the **Locate Filter** box, the software allows you to select only the filtered items in a graphic view and in the **Workspace Explorer**. For example, if you select **Shape**, you can select only shapes that have been placed in a graphic view or in the **Workspace Explorer**.

The Equipment and Furnishings task includes these filters:

Equipment - Limits the selection of items to only equipment items that have been placed from the catalog or as designed equipment items.

Shape - Limits the selection of items to the individual shapes that compose a designed equipment object in a graphic view or in the **Workspace Explorer**.

Pipe Nozzle - Limits the selection of items to pipe nozzles within an equipment object.

HVAC Nozzle - Limits the selection of items to HVAC nozzles within an equipment object.

Conduit Nozzle - Limits the selection of items to conduit nozzles within an equipment object.

Cable Tray Nozzle - Limits the selection of items to cable tray nozzles within an equipment object.

All - Allows the selection of any object, even objects created in another task.

- Use the **Inside** fence command to select all objects entirely inside the fence.

- Use the **Inside/Overlapping** fence command to select all objects entirely inside the fence and those outside but touching the fence at some point.

The **Properties** dialog box permits you to adjust any of the occurrence properties of a particular piece of equipment, shape, or nozzle. not only during initial placement, but also afterwards, including properties that may change the size or shape of the equipment, shape, or nozzle.

Important

- If the equipment model was designed using Solid Edge, modifying any occurrence properties also requires that Solid Edge be installed on your computer.

The **Positioning Relationship** box sets necessary constraints for a piece of equipment or shape either at placement or afterward. Because shapes, equipment objects, and ports added to an equipment object move as a rigid body when the equipment object is manipulated, you must avoid creating positioning relationships that conflict with this rigid body behavior when adding objects to an equipment object. With this in mind, relationships should be restricted to only those objects belonging to the designed equipment object.

Related Topics
- *Edit Designed Equipment Properties*, page 102
- *Edit Equipment Properties*, page 93
- *Edit Equipment Relationships*, page 94
- *Edit Prismatic Shape Properties*, page 115
- *Edit Shape Properties*, page 112

Common Property Tabs: An Overview

The software displays some common property tabs on the properties dialog boxes for all equipment objects. Instead of repeatedly listing the common tabs with each equipment object property dialog box, they are documented here for easy reference.

Configuration Tab

Displays the creation, modification, and status information about an object.

Plant - Displays the name of the plant. You cannot change this value.

Permission Group - Specifies the permission group to which the object belongs. You can select another permission group, if needed. Permission groups are created in the Project Management task.

Status - Specifies the current status of the selected object or filter. Depending on your access level, you may not be able to change the status of the object.

Created - Displays the date and time that the object was created.

Created by - Displays the user name of the person who created the object.

Modified - Displays the date and time when the object was modified.

Modified by - Displays the user name of the person who modified the object.

Connection Tab

Displays information on the connection points of a piece of equipment, including piping, electrical, foundation, or HVAC connections. If more than one equipment object is selected, only the common properties of the connections for the selected objects display on the tab. For more information about the information defined in the reference data, see the *Equipment and Furnishings Reference Data Guide*, available from the **Help > Printable Guides** command in the software.

Connector - Select the connector for which to view properties. When you select a connector from the list, the graphic object associated with the connection (if one exists) highlights in the graphic view for further visual confirmation of the port selected.

Property - Lists all the properties of the selected connection. These properties vary depending on the type of connection selected.

Value - Displays the value of the corresponding property.

Notes Tab

Creates and edits user-definable text placed by the designer on an object in the model. The notes provide special instructions related to the object for the fabricator and are available in downstream tasks. For example, the notes appear in two-dimensional drawings and within design review sessions.

Note

- Only one note of a given kind from a given object can be shown on a drawing. For example, if there are two fabrication notes on a piping part, only one of the notes will show on the drawing. It is important to know about and consider this situation when defining notes on an object in the modeling phase.

  For example, you can display one Fabrication note and one Installation note by defining two separate labels for the two kinds of notes.

Key point - Specifies the key point on the object to which you want to add a note.

Notes at this location, listed by name - Lists all notes for the selected key point on the object.

Date - Displays the date the note was created. The system automatically supplies the date.

Time - Displays the time the note was created. The system automatically supplies the time.

Purpose of note - Specifies the purpose of the note.

Author - Displays the logon name of the person who created the note. The system automatically supplies this information. You cannot change this information.

Note text - Defines the note text. The software does not limit the length of the note text.

New Note - Creates a new note on the object.

Standard Note - Displays a list of standard notes from which you can select. This feature is not available in this version.

Highlight Note - Highlights the note in the graphic view so you can easily find the note and the object to which it is related. This feature is not available in this version.

Delete Note - Deletes the currently displayed note.

Relationship Tab

Displays all objects related to the object for which you are viewing properties. For example, if you are viewing the properties of a pipe run, the related pipeline, features, parts, associated control points, hangers or supports, and equipment display on this tab. All WBS assignments, including project relationships, appear on this tab.

Name - Displays the name of the related object.

Type - Displays the type of related object.

Go To - Displays the properties of the selected object.

Equipment Properties Dialog Box

Displays equipment properties for review and editing.

Related Topics
- *Configuration Tab*, page 84
- *Connection Tab*, page 84
- *Definition Tab*, page 92
- *Notes Tab*, page 85
- *Occurrence Tab (Equipment Properties Dialog Box)*, page 87
- *Place Equipment Ribbon*, page 22
- *Relationship Tab*, page 86

Occurrence Tab (Equipment Properties Dialog Box)

Displays all editable instance-specific information about the selected equipment object. The property name appears on the left side of the grid and the corresponding property value appears on the right side of the grid. If more than one equipment object is selected, only the common occurrence properties for the selected objects appear on the tab.

When viewing properties for a single equipment object, the following properties appear. More properties may appear depending on what you defined in the reference data. For more information about occurrences defined in the reference data, see the *Equipment and Furnishings Reference Data Guide* available with the **Help > Printable Guides** command in the software.

🖉 Note

- Because equipment properties are customizable in the equipment and furnishings reference data, only the properties that are required by the software are documented.

Display Equipment Preview - Displays the bitmap image associated with the equipment object if one has been defined in the reference data. The image displays in a separate window.

Category - Select the properties to view, modify, or define. Equipment properties are divided into several different categories: Standard, Insulation and Tracing, Weight and CG, Fabrication and Construction, Surface Treatment and Coating, Position and Orientation, and Responsibility.

Standard

Name - Displays the name of the equipment object. The equipment name is based on the **Name Rule** selection. To type a new name for the equipment, in the **Name Rule** box, select **User Defined**, and then type a name for the pipe run in the **Name** box.

Name Rule - Specify the naming rule to use to name this equipment object. You can select one of the listed rules or select **User Defined** to specify the equipment name yourself in the **Name** box.

Description - Enter a description for the equipment object.

System - Select the system to which the equipment belongs. By default, the model is the parent system for equipment objects.

Reporting Requirements - Displays the reporting requirement for the equipment object. To add, edit, or remove values that are available for selection, edit the **Reporting Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Reporting Type - Displays the type of reporting. To add, edit, or remove values that are available for selection, edit the **Reporting Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Correlation Status - Displays whether or not the equipment object has been correlated to an equipment object in a P&ID.

Correlation Basis - Specifies if the equipment object is correlated to a P&ID equipment object. Select **Correlate Object** if the equipment has a correlating equipment object in a P&ID. Select **No correlation is required** if the equipment object does not have a correlating equipment object in a P&ID.

Insulation and Tracing

Is Insulated - Displays whether or not the equipment object is insulated.

Thickness - Displays the thickness of the insulation. If **Insulation Specification** is set to use the insulation defined by the equipment object, this field cannot be changed. However, if **Insulation Specification** is manually defined, select the insulation thickness from those allowed for the material in the reference data.

Purpose - Displays the purpose of the insulation. If **Insulation Specification** is set to use the insulation defined by the equipment object, the information in this box cannot be changed. However, if **Insulation Specification** is manually defined, select the purpose of the insulation in this box. Available purposes are read from the reference data.

Material - Displays the material of the insulation. If **Insulation Specification** is set to use the insulation defined by the equipment object, this field cannot be changed. However, if **Insulation Specification** is manually defined, select the insulation material for this along leg feature.

Operating Temperature - Displays the number of degrees of the operating temperature.

Insulation Surface Area - Displays the measurement of the insulation's surface area.

Heat Tracing Requirement - Select whether or not the equipment is heat-traced. To add, edit, or remove values that are available for selection, edit the **Heat Tracing Medium** sheet in the **AllCodeLists.xls** workbook in the reference data.

Heat Tracing Type - Select the type of heat-tracing. To add, edit, or remove values that are available for selection, edit the **Heat Tracing Medium** sheet in the **AllCodeLists.xls** workbook in the reference data.

Heat Tracing Medium - Select the heat-tracing medium to apply to the run. To add, edit, or remove values that are available for selection, edit the **Heat Tracing Medium** sheet in the **AllCodeLists.xls** workbook in the reference data.

Heat Tracing Medium Temperature - Specify the temperature of the heat-tracing medium. Include the temperature unit of measure, K for Kelvin, F for Fahrenheit, or C for Celsius for example, when specifying this value.

Weight & CG

Displays the center-of-gravity and the weight of the selected equipment objects. The center-of-gravity locations are displayed in global system coordinates along the X-, Y-, and Z-axes.

Dry Weight - Displays the dry weight of the equipment object.

Wet Weight - Displays the wet weight of the equipment object.

Dry CGX - Displays the X-axis location of the dry center-of-gravity.

Dry CGY - Displays the Y-axis location of the dry center-of-gravity.

Dry CGZ - Displays the Z-axis location of the dry center-of-gravity.

Wet CGX - Displays the X-axis location of the wet center-of-gravity.

Wet CGY - Displays the Y-axis location of the wet center-of-gravity.

Wet CGZ - Displays the Z-axis location of the wet center-of-gravity.

Fabrication and Construction

Fabrication Requirement - Select the fabrication requirement for the equipment. To add, edit, or remove values that are available for selection, edit the **Fabrication Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Fabrication Type - Select the type of fabrication for the equipment. To add, edit, or remove values that are available for selection, edit the **Fabrication Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Construction Requirement - Select the construction requirement for the equipment. To add, edit, or remove values that are available for selection, edit the **Construction Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Construction Type - Select the type of construction for the equipment. To add, edit, or remove values that are available for selection, edit the **Construction Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Surface Treatment and Coating

Coating Requirement - Select the coating requirement for the equipment. To add, edit, or remove values that are available for selection, edit the **Coating Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Coating Type - Select the type of coating for the equipment. To add, edit, or remove values that are available for selection, edit the **Coating Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Coating Color - Select the color of the equipment coating. To add, edit, or remove values that are available for selection, edit the **Coating Color** sheet in the **AllCodeLists.xls** workbook in the reference data.

Position and Orientation

East - Displays the distance of the connection point from the active coordinate system in the east direction.

North - Displays the distance of the connection point from the active coordinate system in the north direction.

Elevation - Displays the distance of the connection point above or below the active coordinate system.

Bearing - Displays the bearing angle for the equipment.

Pitch - Displays the pitch angle for the equipment.

Roll - Displays the roll angle for the equipment.

Responsibility

Cleaning Responsibility - Select the party responsible for cleaning the equipment object. To add, edit, or remove values that are available for selection, edit the **Cleaning Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Design Responsibility - Select the party responsible for designing the equipment object. To add, edit, or remove values that are available for selection, edit the **Design Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Fabrication Responsibility - Select the party responsible for fabricating the equipment object. To add, edit, or remove values that are available for selection, edit the **Fabrication Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Installation Responsibility - Select the party responsible for installing the equipment object. To add, edit, or remove values that are available for selection, edit the **Installation Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Painting Responsibility - Select the party responsible for painting the equipment object. To add, edit, or remove values that are available for selection, edit the **Painting Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Requisition Responsibility - Select the party responsible for ordering the equipment object. To add, edit, or remove values that are available for selection, edit the **Requisition Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Supply Responsibility - Select the party responsible for delivering the equipment object. To add, edit, or remove values that are available for selection, edit the **Supply Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Testing Responsibility - Select the party responsible for testing the weld on the equipment object. To add, edit, or remove values that are available for selection, edit the **Testing Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Related Topics
- *Equipment Properties Dialog Box*, page 87

Select Insulation Material Dialog Box

Specifies any one of the insulation materials listed for a selected equipment object. This dialog box appears when you click in the **Material** field for the **Insulation and Tracing** category on the **Occurrence** tab of the Properties dialog box. By browsing

through the part hierarchy, you can find and select an insulation material in the Catalog database. After you select a material and click **OK**, the software returns you immediately to the **Occurrence** tab, where you can specify the thickness of the insulation.

Back - Returns you to the previously selected insulation material folder. Use this command to navigate through the hierarchy to the specific insulation material you need.

Forward - Sends you to the last selected insulation material folder that you moved away from by using the **Back** button. Use this command to navigate through the hierarchy to the specific insulation material you need.

Up One Level - Brings up the next highest level of the hierarchy. Use this command to navigate through the hierarchy to the specific material you need.

Properties - Displays the properties of the selected object. Because you cannot modify any properties until the equipment is placed, all properties on the **Properties** dialog box are read-only.

Preview - Displays a bitmap symbol of the selected equipment. The image file must be assigned to the object in the catalog reference data.

List View - Sets the dialog box to display insulation thickness values in a list view.

Grid View - Sets the dialog box to display insulation thickness values in a spreadsheet-style grid view.

Address - Sets the current location within the hierarchy of available insulation materials. The dropdown box lists the folders you have visited.

Related Topics
- *Occurrence Tab (Designed Equipment Properties Dialog Box)*, page 96
- *Occurrence Tab (Equipment Properties Dialog Box)*, page 87

Definition Tab

Displays the component information for the object, the properties and their values, as defined in the reference data. If more than one equipment object is selected, only the common properties for the selected objects display on the tab. For more information about the information defined in the reference data, see the *Equipment and Furnishings Reference Data Guide* available with the **Help > Printable Guides** command in the software.

Category - Determines the category that is displayed in the property grid.

Property - Displays the name of the component property as defined in the reference data.

Value - Displays the value of the corresponding property.

Related Topics
- *Common Property Tabs: An Overview*, page 84

Insulation Tab

Displays insulation properties that have been defined for the selected equipment.

Insulation Specification - Specifies whether or not the selected equipment object is insulated. The options on this dialog box remain disabled unless **User Defined** is selected from the dropdown list.

Purpose - Specifies the insulation purpose for the selected equipment object.

Material - Displays the **Select Insulation Material** dialog box from which you may specify an insulation material.

Thickness - Defines the thickness of the specified insulation material. This option remains disabled until a material is selected from the **Select Insulation Material** dialog box. By default, the smallest thickness value of the selected material is displayed. An alternative value may be selected from the dropdown list.

Related Topics
- *Designed Equipment Properties Dialog Box*, page 96
- *Equipment Properties Dialog Box*, page 87

Edit Equipment Properties

1. Select the equipment object that you need to modify.

2. Click **Equipment Properties** on the horizontal ribbon.

   💡 **Tip**
   - You can also access the **Equipment Properties** dialog box by selecting **Properties** from the **Edit** menu, or by right-clicking the selected object and choosing **Properties** from the short-cut menu.

3. Access the appropriate dialog box tabs and modify the properties as needed.

4. Click **OK** to save your changes and return to the workspace.

   💡 **Tip**
   - You can also select **Apply** to put the changes into effect and continue working in the **Properties** dialog.

✎ **Notes**

- All occurrence and definition properties for an equipment object are defined by the MS Excel workbook named Equipment.xls in the reference data. For information on adding or editing different types of properties, refer to the *SmartPlant 3D Reference Data User's Guide* accessible from the **Help > Printable Guides** command.

- If more than one piece of equipment is selected, the **Occurrence** tab will only display the common occurrence properties of the objects.

- The **Definition**, **Connections**, **Weight & CG**, and **Relationship** tabs are read-only. You cannot edit this information from the **Equipment Properties** dialog box.

- If the equipment model was created using Solid Edge, then any changes that would affect the shape or size of the equipment model require that you have Solid Edge running on your computer.

Related Topics
- *Edit Equipment Relationships*, page 94
- *Editing Properties and Relationships: An Overview*, page 82
- *Equipment Properties Dialog Box*, page 87
- *Placing Equipment from the Catalog: An Overview*, page 15

Edit Equipment Relationships

1. Select the equipment that you need to modify.

   💡 **Tip**

   - To edit the properties of a designed equipment object for which geometry has yet to be defined, you must select the object from the system hierarchy in the **Workspace Explorer**.

2. Choose the relationship in the **Relationship List** box.

3. Change the type of relationship using the **Positioning Relationship** box as needed.

   Set Positioning Relationships for Equipment, page 27
   Set Positioning Relationships for Designed Equipment, page 60

   ✎ **Note**

   - You can also remove relationships by clicking **Delete Relationship** ⨯⊩ on the ribbon. This step is often necessary when moving previously constrained equipment. After a relationship is deleted, no connectivity remains between the two pieces of equipment during further design operations.

Related Topics

- *Edit Designed Equipment Properties*, page 102
- *Edit Equipment Properties*, page 93
- *Editing Properties and Relationships: An Overview*, page 82

Designed Equipment Properties Dialog Box

Displays designed equipment properties for review and editing.

Related Topics
- *Configuration Tab*, page 84
- *Definition Tab (Designed Equipment Properties Dialog Box)*, page 101
- *Notes Tab*, page 85
- *Occurrence Tab (Designed Equipment Properties Dialog Box)*, page 96
- *Place Designed Equipment Ribbon*, page 56
- *Relationship Tab*, page 86

Occurrence Tab (Designed Equipment Properties Dialog Box)

Displays all editable instance-specific information about the selected designed equipment object. The property name appears on the left side of the grid and the corresponding property value appears on the right side of the grid. If more than one equipment object is selected, common occurrence properties for the selected objects appear on the tab.

When viewing properties for a single equipment object, the following properties appear. More properties may appear depending on what you defined in the reference data. For more information about occurrences defined in the reference data, see the *Equipment and Furnishings Reference Data Guide* available from the **Help > Printable Guides** command in the software.

📝 Note

- Because equipment properties are customizable in the equipment and furnishings reference data, only the properties that are required by the software are documented.

🖳 **Display Equipment Preview** - This button is disabled for designed equipment.

Category - Select the properties to view, modify, or define. Equipment properties are divided into several different categories: Standard, Insulation and Tracing, Weight and CG, Fabrication and Construction, Surface Treatment and Coating, Position and Orientation, and Responsibility.

Standard

Name - Displays the name of the equipment object. The equipment name is based on the **Name Rule** selection. To type a new name for the equipment, in the **Name Rule** box, select **User Defined**, and then type a name for the pipe run in the **Name** box.

Name Rule - Specify the naming rule to use to name this equipment object. You can select one of the listed rules or select **User Defined** to specify the equipment name yourself in the **Name** box.

Description - Enter a description for the equipment object.

System - Select the system to which the equipment belongs. By default, the model is the parent system for equipment objects.

Reporting Requirements - Displays the reporting requirement for the equipment object. To add, edit, or remove values that are available for selection, edit the **Reporting Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Reporting Type - Displays the type of reporting. To add, edit, or remove values that are available for selection, edit the **Reporting Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Correlation Status - Displays whether or not the equipment object has been correlated to an equipment object in a P&ID.

Correlation Basis - Specifies if the equipment object is correlated to a P&ID equipment object. Select **Correlate Object** if the equipment has a correlating equipment object in a P&ID. Select **No correlation is required** if the equipment object does not have a correlating equipment object in a P&ID.

Insulation and Tracing

Is Insulated - Specifies whether the equipment object is insulated.

Thickness - Displays the thickness of the insulation. If **Insulation Specification** is set to use the insulation defined by the equipment object, this field cannot be changed. However, if **Insulation Specification** is manually defined, select the insulation thickness from those allowed for the material in the reference data.

Purpose - Displays the purpose of the insulation. If **Insulation Specification** is set to use the insulation defined by the equipment object, the information in this box cannot be changed. However, if **Insulation Specification** is manually defined, select the purpose of the insulation in this box. Available purposes are read from the reference data.

Material - Displays the material of the insulation. If **Insulation Specification** is set to use the insulation defined by the equipment object, this field cannot be changed. However, if **Insulation Specification** is manually defined, select the insulation material for this along leg feature.

Operating Temperature - Displays the number of degrees of the operating temperature.

Insulation Surface Area - Displays the measurement of the insulation's surface area.

Heat Tracing Requirement - Select whether the equipment is heat-traced. To add, edit, or remove values that are available for selection, edit the **Heat Tracing Medium** sheet in the **AllCodeLists.xls** workbook in the reference data.

Heat Tracing Type - Select the type of heat-tracing. To add, edit, or remove values that are available for selection, edit the **Heat Tracing Medium** sheet in the **AllCodeLists.xls** workbook in the reference data.

Heat Tracing Medium - Select the heat-tracing medium to apply to the run. To add, edit, or remove values that are available for selection, edit the **Heat Tracing Medium** sheet in the **AllCodeLists.xls** workbook in the reference data.

Heat Tracing Medium Temperature - Specify the temperature of the heat-tracing medium. Include the temperature unit of measure, K for Kelvin, F for Fahrenheit, or C for Celsius for example, when specifying this value.

Weight & CG

Dry Weight - Displays the dry weight of the equipment object.

Wet Weight - Displays the wet weight of the equipment object.

Dry CGX - Displays the X-axis location of the dry center-of-gravity.

Dry CGY - Displays the Y-axis location of the dry center-of-gravity.

Dry CGZ - Displays the Z-axis location of the dry center-of-gravity.

Wet CGX - Displays the X-axis location of the wet center-of-gravity.

Wet CGY - Displays the Y-axis location of the wet center-of-gravity.

Wet CGZ - Displays the Z-axis location of the wet center-of-gravity.

Fabrication and Construction

Fabrication Requirement - Select the fabrication requirement for the equipment. To add, edit, or remove values that are available for selection, edit the **Fabrication Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Fabrication Type - Select the type of fabrication for the equipment. To add, edit, or remove values that are available for selection, edit the **Fabrication Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Construction Requirement - Select the construction requirement for the equipment. To add, edit, or remove values that are available for selection, edit the **Construction Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Construction Type - Select the type of construction for the equipment. To add, edit, or remove values that are available for selection, edit the **Construction Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Surface Treatment and Coating

Coating Requirement - Select the coating requirement for the equipment. To add, edit, or remove values that are available for selection, edit the **Coating Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Coating Type - Select the type of coating for the equipment. To add, edit, or remove values that are available for selection, edit the **Coating Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Coating Color - Select the color of the equipment coating. To add, edit, or remove values that are available for selection, edit the **Coating Color** sheet in the **AllCodeLists.xls** workbook in the reference data.

Position and Orientation

East - Displays the distance of the connection point from the model origin in the east direction.

North - Displays the distance of the connection point from the model origin in the north direction.

Elevation - Displays the distance of the connection point above or below the model origin.

Bearing - Displays the bearing angle for the equipment.

Pitch - Displays the pitch angle for the equipment.

Roll - Displays the roll angle for the equipment.

Responsibility

Cleaning Responsibility - Select the party responsible for cleaning the equipment object. To add, edit, or remove values that are available for selection, edit the **Cleaning Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Design Responsibility - Select the party responsible for designing the equipment object. To add, edit, or remove values that are available for selection, edit the **Design Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Fabrication Responsibility - Select the party responsible for fabricating the equipment object. To add, edit, or remove values that are available for selection, edit the **Fabrication Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Installation Responsibility - Select the party responsible for installing the equipment object. To add, edit, or remove values that are available for selection, edit the **Installation Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Painting Responsibility - Select the party responsible for painting the equipment object. To add, edit, or remove values that are available for selection, edit the **Painting Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Requisition Responsibility - Select the party responsible for ordering the equipment object. To add, edit, or remove values that are available for selection, edit the **Requisition Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Supply Responsibility - Select the party responsible for delivering the equipment object. To add, edit, or remove values that are available for selection, edit the **Supply Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Testing Responsibility - Select the party responsible for testing the weld on the equipment object. To add, edit, or remove values that are available for selection, edit the **Testing Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Related Topics
- *Designed Equipment Properties Dialog Box*, page 96

Select Insulation Material Dialog Box

Specifies any one of the insulation materials listed for a selected equipment object. This dialog box appears when you click in the **Material** field for the **Insulation and Tracing** category on the **Occurrence** tab of the Properties dialog box. By browsing through the part hierarchy, you can find and select an insulation material in the Catalog database. After you select a material and click **OK**, the software returns you immediately to the **Occurrence** tab, where you can specify the thickness of the insulation.

⬅ **Back** - Returns you to the previously selected insulation material folder. Use this command to navigate through the hierarchy to the specific insulation material you need.

⇨ **Forward** - Sends you to the last selected insulation material folder that you moved away from by using the **Back** button. Use this command to navigate through the hierarchy to the specific insulation material you need.

Up One Level - Brings up the next highest level of the hierarchy. Use this command to navigate through the hierarchy to the specific material you need.

Properties - Displays the properties of the selected object. Because you cannot modify any properties until the equipment is placed, all properties on the **Properties** dialog box are read-only.

Preview - Displays a bitmap symbol of the selected equipment. The image file must be assigned to the object in the catalog reference data.

List View - Sets the dialog box to display insulation thickness values in a list view.

Grid View - Sets the dialog box to display insulation thickness values in a spreadsheet-style grid view.

Address - Sets the current location within the hierarchy of available insulation materials. The dropdown box lists the folders you have visited.

Related Topics
- *Occurrence Tab (Designed Equipment Properties Dialog Box)*, page 96
- *Occurrence Tab (Equipment Properties Dialog Box)*, page 87

Definition Tab (Designed Equipment Properties Dialog Box)

Displays the component information for the designed equipment object, the properties and their values, as defined in the reference data. Unlike equipment objects you place directly from the Catalog, these properties are not defined in the reference data. Rather, they can be user-defined for each designed equipment instance.

Category - Select the properties to define or modify. Designed equipment component information is divided into several different categories: **Standard**, **Equipment Support**, **Nozzle Length**, and **Equipment Dimensions**. You select which category to define or modify values for by using the **Category** option.

 Important

- Not all categories are available for all designed equipment objects.

Property - Displays the name of the component property. The properties that appear are dependent on the equipment type on which the selected designed equipment object is based. For example, the properties displayed for a designed equipment object based on a catalog pump are different from those based on a catalog cooler. For more information on equipment part properties, see *the Equipment and*

Furnishings Reference Data Guide, available with the **Help > Printable Guides** command within the Equipment and Furnishings task.

Value - Displays the value of the corresponding property.

Related Topics
- *Designed Equipment Properties Dialog Box*, page 96

Insulation Tab

Displays insulation properties that have been defined for the selected equipment.

Insulation Specification - Specifies whether or not the selected equipment object is insulated. The options on this dialog box remain disabled unless **User Defined** is selected from the dropdown list.

Purpose - Specifies the insulation purpose for the selected equipment object.

Material - Displays the **Select Insulation Material** dialog box from which you may specify an insulation material.

Thickness - Defines the thickness of the specified insulation material. This option remains disabled until a material is selected from the **Select Insulation Material** dialog box. By default, the smallest thickness value of the selected material is displayed. An alternative value may be selected from the dropdown list.

Related Topics
- *Designed Equipment Properties Dialog Box*, page 96
- *Equipment Properties Dialog Box*, page 87

Edit Designed Equipment Properties

1. On the horizontal ribbon, set the **Locate Filter** box to **Equipment**, and then select an equipment object.

   💡 **Tips**

   - If the **Locate Filter** box is not displayed on the horizontal ribbon, click the **Select Tool** ⃗ on the vertical toolbar.

   - To edit the properties of a designed equipment object for which geometry has yet to be defined, you must select the object from the system hierarchy in the **Workspace Explorer**.

2. Click **Properties** 🖼 on the horizontal ribbon.

💡 **Tip**

- You can also access the **Properties** dialog box by selecting **Properties** from the **Edit** menu, or by right-clicking an equipment object and choosing **Properties** from the short-cut menu.

3. Access the appropriate dialog box tabs and modify the properties as needed.

4. Click **OK** to save your changes and return to the workspace.

💡 **Tip**

- You can also select **Apply** to put the changes into effect and continue working in the **Properties** dialog box.

📝 **Notes**

- Occurrence and definition properties for an equipment object are defined by the Excel workbook named **Equipment.xls** in the reference data. For information on adding or editing different types of properties, refer to the *SmartPlant 3D Reference Data Guide* accessible from the **Help > Printable Guides** command in the software.

- If more than one piece of equipment is selected, the **Occurrence** tab will display only the common occurrence properties of the items.

- The **Definition**, **Connections**, **Weight & CG**, and **Relationship** tabs are read-only. The properties and values displayed on these tabs are defined in the reference data. For more information, see the *Equipment and Furnishings Reference Data Guide* accessible from the **Help > Printable Guides** command in the software.

- If the equipment model was created using Solid Edge, then any changes that would affect the shape or size of the equipment model require that you have Solid Edge running on your computer.

Related Topics

Equipment Component Properties Dialog Box

Displays equipment component properties for review and editing.

Related Topics
- *Configuration Tab*, page 84
- *Connection Tab*, page 84
- *Definition Tab (Equipment Component Properties Dialog Box)*, page 109
- *Notes Tab*, page 85
- *Occurrence Tab (Equipment Component Properties Dialog Box)*, page 104
- *Place Equipment Ribbon*, page 22
- *Relationship Tab*, page 86

Occurrence Tab (Equipment Component Properties Dialog Box)

Displays all editable instance-specific information about the selected equipment component. The property name appears on the left side of the grid and the corresponding property value appears on the right side of the grid. If more than one component is selected, only the common occurrence properties for the selected objects appear on the tab.

When viewing properties for a single component, the following properties appear. More properties may appear depending on what you defined in the reference data. For more information about occurrences defined in the reference data, see the *Equipment and Furnishings Reference Data Guide* available with the **Help > Printable Guides** command in the software.

Note

- Because equipment component properties are customizable in the equipment and furnishings reference data, only the properties that are required by the software are documented.

⊞ **Display Equipment Preview** - Displays the bitmap image associated with the equipment component if one has been defined in the reference data. The image displays in a separate window.

Category - Select the properties to view, modify, or define. Equipment component properties are divided into several different categories: Standard, Insulation and Tracing, Weight and CG, Fabrication and Construction, Surface Treatment and Coating, Position and Orientation, and Responsibility.

Standard

Name - Displays the name of the equipment object. The equipment name is based on the **Name Rule** selection. To type a new name for the equipment, in the **Name Rule** box, select **User Defined**, and then type a name for the pipe run in the **Name** box.

Name Rule - Specify the naming rule to use to name this equipment object. You can select one of the listed rules or select **User Defined** to specify the equipment name yourself in the **Name** box.

Description - Enter a description for the equipment object.

Equipment - Select the equipment to which the component belongs.

Reporting Requirements - Displays the reporting requirement for the equipment object. To add, edit, or remove values that are available for selection, edit the **Reporting Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Reporting Type - Displays the type of reporting. To add, edit, or remove values that are available for selection, edit the **Reporting Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Correlation Status - Displays whether or not the equipment object has been correlated to an equipment object in a P&ID.

Correlation Basis - Specifies if the equipment object is correlated to a P&ID equipment object. Select **Correlate Object** if the equipment has a correlating equipment object in a P&ID. Select **No correlation is required** if the equipment object does not have a correlating equipment object in a P&ID.

Position and Orientation

East - Displays the distance of the connection point from the active coordinate system in the east direction.

North - Displays the distance of the connection point from the active coordinate system in the north direction.

Elevation - Displays the distance of the connection point above or below the active coordinate system.

Bearing - Displays the bearing angle for the equipment.

Pitch - Displays the pitch angle for the equipment.

Roll - Displays the roll angle for the equipment.

Insulation and Tracing

Is Insulated - Displays whether or not the equipment object is insulated.

Thickness - Displays the thickness of the insulation. If **Insulation Specification** is set to use the insulation defined by the equipment object, this field cannot be changed. However, if **Insulation Specification** is manually defined, select the insulation thickness from those allowed for the material in the reference data.

Requirement - Select the insulation requirement to apply to the component.

Insulation Type - Select the type of insulation to apply to the component.

Insulation Purpose - Displays the purpose of the insulation. If **Insulation Specification** is set to use the insulation defined by the equipment object, the information in this box cannot be changed. However, if **Insulation Specification** is manually defined, select the purpose of the insulation in this box. Available purposes are read from the reference data.

Material - Displays the material of the insulation. If **Insulation Specification** is set to use the insulation defined by the equipment object, this field cannot be changed. However, if **Insulation Specification** is manually defined, select the insulation material for this along leg feature.

Operating Temperature - Displays the number of degrees of the operating temperature.

Insulation Surface Area - Displays the measurement of the insulation's surface area.

Heat Tracing Requirement - Select whether or not the equipment is heat-traced. To add, edit, or remove values that are available for selection, edit the **Heat Tracing Medium** sheet in the **AllCodeLists.xls** workbook in the reference data.

Heat Tracing Type - Select the type of heat-tracing. To add, edit, or remove values that are available for selection, edit the **Heat Tracing Medium** sheet in the **AllCodeLists.xls** workbook in the reference data.

Heat Tracing Medium - Select the heat-tracing medium to apply to the run. To add, edit, or remove values that are available for selection, edit the **Heat Tracing Medium** sheet in the **AllCodeLists.xls** workbook in the reference data.

Heat Tracing Medium Temperature - Specify the temperature of the heat-tracing medium. Include the temperature unit of measure, K for Kelvin, F for Fahrenheit, or C for Celsius for example, when specifying this value.

Weight & CG

Displays the center-of-gravity and the weight of the selected equipment objects. The center-of-gravity locations are displayed in global system coordinates along the X-, Y-, and Z-axes.

Dry Weight - Displays the dry weight of the equipment object.

Wet Weight - Displays the wet weight of the equipment object.

Dry CGX - Displays the X-axis location of the dry center-of-gravity.

Dry CGY - Displays the Y-axis location of the dry center-of-gravity.

Dry CGZ - Displays the Z-axis location of the dry center-of-gravity.

Wet CGX - Displays the X-axis location of the wet center-of-gravity.

Wet CGY - Displays the Y-axis location of the wet center-of-gravity.

Wet CGZ - Displays the Z-axis location of the wet center-of-gravity.

Fabrication and Construction

Fabrication Requirement - Select the fabrication requirement for the equipment. To add, edit, or remove values that are available for selection, edit the **Fabrication Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Fabrication Type - Select the type of fabrication for the equipment. To add, edit, or remove values that are available for selection, edit the **Fabrication Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Construction Requirement - Select the construction requirement for the equipment. To add, edit, or remove values that are available for selection, edit the **Construction Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Construction Type - Select the type of construction for the equipment. To add, edit, or remove values that are available for selection, edit the **Construction Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Surface Treatment and Coating

Coating Requirement - Select the coating requirement for the equipment. To add, edit, or remove values that are available for selection, edit the **Coating Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Coating Type - Select the type of coating for the equipment. To add, edit, or remove values that are available for selection, edit the **Coating Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Coating Color - Select the color of the equipment coating. To add, edit, or remove values that are available for selection, edit the **Coating Color** sheet in the **AllCodeLists.xls** workbook in the reference data.

Coating Area - Type the area of the coating for the component.

Responsibility

Cleaning Responsibility - Select the party responsible for cleaning the equipment object. To add, edit, or remove values that are available for selection, edit the **Cleaning Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Design Responsibility - Select the party responsible for designing the equipment object. To add, edit, or remove values that are available for selection, edit the **Design Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Fabrication Responsibility - Select the party responsible for fabricating the equipment object. To add, edit, or remove values that are available for selection, edit the **Fabrication Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Installation Responsibility - Select the party responsible for installing the equipment object. To add, edit, or remove values that are available for selection, edit the **Installation Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Painting Responsibility - Select the party responsible for painting the equipment object. To add, edit, or remove values that are available for selection, edit the **Painting Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Requisition Responsibility - Select the party responsible for ordering the equipment object. To add, edit, or remove values that are available for selection, edit the **Requisition Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Supply Responsibility - Select the party responsible for delivering the equipment object. To add, edit, or remove values that are available for selection, edit the **Supply Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Testing Responsibility - Select the party responsible for testing the weld on the equipment object. To add, edit, or remove values that are available for selection, edit the **Testing Responsibility** sheet in the **AllCodeLists.xls** workbook in the reference data.

Related Topics
- *Equipment Component Properties Dialog Box*, page 104

Definition Tab (Equipment Component Properties Dialog Box)

Displays the component information for the object, the properties and their values, as defined in the reference data. If more than one equipment object is selected, only the common properties for the selected objects display on the tab. For more information about the information defined in the reference data, see the *Equipment and Furnishings Reference Data Guide* available with the **Help > Printable Guides** command in the software.

Category - Determines the category that is displayed in the property grid.

Property - Displays the name of the component property as defined in the reference data.

Value - Displays the value of the corresponding property.

Part Number - Displays the part number of the equipment component.

Part Description - Displays the description of the equipment component.

Mirror Behavior Option - Displays the mirror behavior defined for the equipment component.

Equipment Component Classification - Displays the classification information defined in the reference data.

Related Topics
- *Equipment Component Properties Dialog Box*, page 104

Shape Properties Dialog Box

Displays shape properties for review and editing.

Related Topics
- *Configuration Tab*, page 84
- *Cross-Section Tab (Shape Properties Dialog Box)*, page 111
- *Notes Tab*, page 85
- *Occurrence Tab (Shape Properties Dialog Box)*, page 110
- *Relationship Tab*, page 86

Occurrence Tab (Shape Properties Dialog Box)

Sets properties for the unique instance of the selected shape. Shapes can be placed either from what has been defined in the reference data, or by importing a geometric shape contained within a SAT file.

Category - Displays the defined category name for the selected designed equipment. This data is retrieved from the Equipment and Furnishings reference data.

Display Aspect - Lists all the display aspects that may be applied to the selected shape. The selected shape displays graphically in the model.

Property - Lists all the dimensional properties of the selected shape. You can add or modify these properties through the catalog reference data.

Value - Shows the current values for all properties of the selected shape. You can modify these values to reflect exact design needs or deviations from the standard part.

Name - Specifies the name for the selected shape.

Position and Orientation

East - Displays the distance of the connection point from the active coordinate system in the east direction.

North - Displays the distance of the connection point from the active coordinate system in the north direction.

Elevation - Displays the distance of the connection point above or below the active coordinate system.

Bearing - Displays the bearing angle for the shape.

Pitch - Displays the pitch angle for the shape.

Roll - Displays the roll angle for the shape.

Related Topics

- *Shape Properties Dialog Box*, page 110

Cross-Section Tab (Shape Properties Dialog Box)
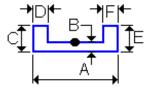
Displays information about the cross section of a shape that was projected along a path. This tab is only available when you select **More** on the **Shapes** list, and then select a prismatic shape.

Cross Section - Specifies the type of cross section for the shape. You can either select a standard cross section defined in the reference data or select **Sketch** to draw your own cross section.

When any standard cross-section type is selected in the **Cross Section** list, you can modify the properties that are described later in this topic. When **Sketch** is selected in the **Cross Section** list, you can view options, such as each point, its X-, Y-, and Z-coordinates in the model, and its turn type, but you cannot modify them. For more information, see *General Tab (Sketch Properties Dialog Box)*, page 118.

⊡ **Display Cross Section Image** - Displays the image associated with the standard cross-section type in the reference data.

Cross-section images show the dimensions that you can define for the cross-section type, the default cardinal points for the cross-section type, and the angle for the cross section. For example, the following graphic contains the dimensions and cardinal point for a standard road cross section.

If no image is associated with the cross section and the selected cardinal point, **Image Not Available** appears at the bottom of the tab.

A - G - Defines the dimensions for standard cross sections. If an image is defined for the cross section in the reference data, you can see what each letter represents by clicking **Display Cross Section Image** ⊡.

Cardinality - Defines the point where the software attaches the cross section to the path. If you click **Display Cross Section Image** ⊡ to see a graphic of the cross section, you can view where each cardinal point is located by selecting each cardinal point in the list. The software automatically updates the display, if the appropriate graphic is available, with a graphic containing the selected cardinal point.

Angle - Defines the angle by which the cross section is rotated about the path.

Related Topics

- *Shape Properties Dialog Box*, page 110

Select Shape Dialog Box

Specifies a shape to place on an equipment or equipment object. The dialog box appears automatically when you click **More** in the **Shape** floating palette. By browsing through the shapes hierarchy, you can find any shape that exists in the Catalog database. After you select a shape, you can return to the **Shape Properties** dialog box where you can finish defining shape properties.

Back - Returns you to the previously selected shape type or node. Use this command to navigate through the hierarchy to the specific shape you need.

Forward - Sends you to the last selected shape type or node that you moved away from by using the **Back** button. Use this command to navigate through the hierarchy to the specific shape you need.

Up One Level - Brings up the next highest level of the Shapes catalog hierarchy. Use this command to navigate through the hierarchy to the specific shape you need.

Properties - Displays the properties of the selected shape. Because you cannot modify any properties until the shape is placed, all properties on the **Properties** dialog box are read-only.

Preview - Displays a bitmap symbol of the selected shape. The image file must be assigned to the shape in the catalog reference data.

List View -Sets the dialog box to display shapes in a list view.

Grid View - Sets the dialog box to display shapes in a spreadsheet-style grid view.

Address - Specifies your exact location within the displayed hierarchy.

Edit Shape Properties

1. On the horizontal ribbon, set the **Locate Filter** box to **Shape**, and then select a shape.

   Tip

   - If the **Locate Filter** box is not displayed on the horizontal ribbon, click the **Select Tool** on the vertical toolbar.
2. Click **Shape Properties** on the horizontal ribbon.

💡 **Tip**

- You can also access the **Shape Properties** dialog box by selecting **Properties** from the **Edit** menu, or by right-clicking the shape and choosing **Properties** from the short-cut menu.

3. On the **Occurrence** tab, modify the geometric dimensions of the shape.

4. Access the other dialog box tabs, and modify the properties as needed.

5. Click **OK** to save your changes and return to the workspace.

💡 **Tip**

- You can also select **Apply** to put the changes into effect and continue working in the **Properties** dialog box.

📝 **Notes**

- Each geometric shape object has its own Properties dialog box that displays its corresponding parameters, including any reference graphics that illustrate what the dimensional parameters represent.

- All occurrence and definition properties for an equipment object are defined by the Excel workbook named **Equipment.xls** in the reference data. For information on adding or editing different types of properties, refer to the *SmartPlant 3D Reference Data User's Guide* accessible from the **Help > Printable Guides** command.

Related Topics
- *Editing Properties and Relationships: An Overview*, page 82
- *Placing Designed Equipment: An Overview*, page 33
- *Shape Properties Dialog Box*, page 110

Prismatic Shape Properties Dialog Box

Displays prismatic shape properties for review and editing.

Related Topics
- *Configuration Tab*, page 84
- *Cross-Section Tab (Prismatic Shape Properties Dialog Box)*, page 114
- *Notes Tab*, page 85
- *Occurrence Tab (Prismatic Shape Properties Dialog Box)*, page 114
- *Place Prismatic Shape Ribbon*, page 35
- *Relationship Tab*, page 86

Occurrence Tab (Prismatic Shape Properties Dialog Box)

Sets properties for the unique instance of the selected prismatic shape. Prismatic shapes can be placed in the model by selecting **PrismaticShape** in the **Shapes** dropdown list on the **Shape Properties** dialog box (**Occurrence** tab).

Category - Displays the defined category name for the selected prismatic shape. This data is retrieved from the Equipment and Furnishings reference data.

Shape - Displays the PrismaticShape icon. This option is read-only when you access the tab to edit a prismatic shape that has already been placed in the model.

Display Aspect -Lists all the display aspects that may be applied to the selected shape. The selected shape displays graphically in the model.

Name - Displays the name defined for the selected prismatic shape during its initial placement in the model.

Related Topics
- *Prismatic Shape Properties Dialog Box*, page 114

Cross-Section Tab (Prismatic Shape Properties Dialog Box)

Displays information about the cross section for a prismatic shape that was projected along a path.
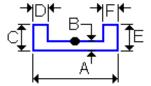
Cross Section - Specifies the type of cross section for the prismatic shape. You can either select a standard cross section defined in the reference data or select **Sketch** to draw your own cross section.

When any standard cross-section type is selected in the **Cross Section** list, you can modify the properties that are described later in this topic. When **Sketch** is selected in the **Cross Section** list, you can view options, such as each point, its X-, Y-, and Z-

coordinates in the model, and its turn type, but you cannot modify them. For more information, see *General Tab (Sketch Properties Dialog Box)*, page 118.

⬛ **Display Cross Section Image** - Displays the image associated with the standard cross-section type in the reference data.

Cross-section images show the dimensions that you can define for the cross-section type, the default cardinal points for the cross-section type, and the angle for the cross section. For example, the following graphic contains the dimensions and cardinal point for a standard road cross section:

If no image is associated with the cross section and the selected cardinal point, **Image Not Available** appears at the bottom of the tab.

A - G - Defines the dimensions for standard cross sections. If an image is defined for the cross section in the reference data, you can see what each letter represents by clicking **Display Cross Section Image** ⬛.

Cardinality - Defines the point where the software to attaches the cross section to the path. If you click **Display Cross-Section Image** ⬛ to see a graphic of the cross section, you can view where each cardinal point is located by selecting each cardinal point in the list. The software automatically updates the display, if the appropriate graphic is available, with a graphic containing the selected cardinal point.

Angle - Defines the angle by which the cross section is rotated about the path.

Related Topics
- *Edit Cross-Section Properties for a Prismatic Shape*, page 116
- *Prismatic Shape Properties Dialog Box*, page 114

Edit Prismatic Shape Properties

1. On the horizontal ribbon, set the **Locate Filter** box to **Shape**, and then select a prismatic shape.

   💡 **Tip**

   - If the **Locate Filter** box is not displayed on the horizontal ribbon, click the **Select Tool** ⬆ on the vertical toolbar.
2. Click **Properties** 📋 on the horizontal ribbon.

💡 **Tips**

- You can also access the **Prismatic Shape Properties** dialog box from the **Relationship** tab on the **Designed Equipment Properties** dialog box. Select the name of the prismatic shape to edit, and click **Go To**.

3. On the **Occurrence** tab, modify the display aspect or the name of the prismatic shape.

4. On the **Cross-Section** tab, modify the geometric dimensions of the existing cross section, or select a new cross section and enter new property information.

5. Access the other dialog box tabs and modify the properties as needed.

6. Click **OK** to save your changes and return to the workspace.

💡 **Tip**

- You can also select **Apply** to put the changes into effect and continue working in the **Properties** dialog box.

📝 **Notes**

- Each geometric shape object has its own Properties dialog box that displays its corresponding parameters, including any reference graphics that illustrate what the dimensional parameters represent.

- All occurrence and definition properties for an equipment object are defined by the Excel workbook named **Equipment.xls** in the reference data. For information on adding or editing different types of properties, refer to the *SmartPlant 3D Reference Data User's Guide* accessible from the **Help > Printable Guides** command in the software.

Related Topics
- *Creating Customized Shapes: An Overview*, page 34
- *Editing Properties and Relationships: An Overview*, page 82
- *Placing Designed Equipment: An Overview*, page 33
- *Shape Properties Dialog Box*, page 110

Edit Cross-Section Properties for a Prismatic Shape

1. Click **Select** ⬚.

2. On the horizontal ribbon, set the **Locate Filter** box to **Shape**, and then select a prismatic shape.

💡 **Tip**

- If the **Locate Filter** box is not displayed on the horizontal ribbon, click the **Select Tool** ⬚ on the vertical toolbar.

3. On the ribbon, click **Properties** ⬚.

4. In the **Prismatic Shape Properties** dialog box, click the **Cross-Section** tab.

5. Make modifications to the cross-section properties.

   💡 **Tip**

   - As you make changes to the cross-section properties, the cross-section changes appear dynamically in the model.

6. Click **OK**.

7. Click **Finish** to apply the changes to the cross section to the volume.

📝 **Notes**

- If you sketch a cross section, the properties for the cross section include the X-, Y-, and Z-coordinates, the turn type, and values for each point that define the cross-section path.

- You cannot modify the properties of a sketched cross section in the **Prismatic Shape Properties** dialog box. Instead, you must make changes to the path that defines the cross-section sketch. For more information, see *Modify a Sketched Cross Section*, page 44.

Related Topics
- *Add Segments to a Path*, page 47
- *Edit Cross-Section Properties for a Prismatic Shape*, page 116
- *Modify a Sketched Cross Section*, page 44
- *Modify a Straight Segment in a Path*, page 49
- *Modify a Turn in a Path*, page 54
- *Modify an Arc in a Path*, page 51
- *Move Segments of a Path*, page 48

Sketch Properties Dialog Box

Sets options for paths. You cannot edit the different applicable properties.

Related Topics
- *General Tab (Sketch Properties Dialog Box)*, page 118

General Tab (Sketch Properties Dialog Box)

Displays the points that make up a path, their X-, Y-, and Z-coordinates, turn types, and turn type dimensions.

Point No - Displays the point number that identifies the selected point.

X - Displays the location of the point on the X-axis.

Y - Displays the location of the point on the Y-axis.

Z - Displays the location of the point on the Z-axis.

Turn Type - Displays the type of turn associated with the point. Turn types include none, bend, chamfer, and cornice.

Value - Specifies dimensions for the selected turn type. For bends and cornices, the value specifies the radius of the bend. For chamfers, the value specifies the dimensions for setback A and setback B of the chamfer.

Related Topics
- *Sketch Properties Dialog Box*, page 118

Nozzle Properties Dialog Box

Displays nozzle properties for review and editing.

Related Topics
- *Configuration Tab*, page 84
- *Location Tab (Nozzle Properties Dialog Box)*, page 123
- *Occurrence Tab (Nozzle Properties Dialog Box)*, page 119
- *Place Nozzle Ribbon*, page 67

Occurrence Tab (Nozzle Properties Dialog Box)

Displays the nozzle properties that you can edit. The property name appears on the left side of the grid and the corresponding property value appears on the right side of the grid. You can modify these values after the initial placement of the nozzle to reflect exact design needs or deviations from the standard part. If you selected more than one nozzle and then selected the properties command, only the common properties between the selected nozzles appear.

Category - Displays the defined category name for the selected nozzle. This data is retrieved from the Equipment and Furnishings reference data.

Port Type - Specifies the type of port for placement on a selected shape. If the selected port type requires user-defined physical dimensions, a bitmap graphic of the selected port type displays at the bottom of the dialog box. The graphic contains labeled parameters (A, B, C, etc.) that can be user-defined in the **Value** column of the grid. If the selected port type requires no user-defined physical dimensions, no graphic is displayed. This option does not appear when you access the tab to edit a nozzle that has already been placed in the model.

From catalog - Displays the **Select Nozzle** dialog box so that you can select an existing nozzle from the Catalog.

The following is a complete list of properties, both common and unique, that can be defined using the **Occurrence** tab. Initial values are defined in the reference data. For more information on properties, refer to the *Equipment and Furnishings Reference Data Guide*, available from the **Help > Printable Guides** command in the software.

Notes
- Properties that display on the **Occurrence** tab are dependent on the port type you select.
- Properties are listed alphabetically rather than the order in which they may appear.

Actual Depth - Type the actual depth of the cable tray port.

Actual Width - Type the actual width of the cable tray port.

Area - Type the diameter of the nozzle opening.

Bend Length - Type the allowable bend length as an absolute value.

Bend Radius - Type the allowable measurement for the bend radius.

Conduit Diameter - Displays the diameter of the conduit for the nozzle.

Corner Radius - Type the allowable measurement for the corner radius.

Cpt Offset - Displays the offset value of the center point for the nozzle.

Cross Section Shape - Displays the shape of the nozzle cross section.

Diameter - Type the diameter of the nozzle.

Dimension Base Outer - Displays the outer dimension of the base of the nozzle.

End Practice - Specifies the end practice for the nozzle.

End Preparation - Enter the end preparation code for the part port. Valid codes are listed in the **AllCodeLists.xls** workbook on the **End Preparation** sheet in the **Codelist Number** column.

End Standard - Enter the end standard code for the part port. Valid codes are listed in the **AllCodeLists.xls** workbook on the **End Standard** sheet in the **Codelist Number** column.

Flange or Hub Outside Diameter - Specifies the diameter for the flange or hub of the nozzle.

Flange or Hub Thickness - Displays the thickness of the flange or hub of the nozzle.

Flange or Mechanical Groove Width - Displays the width of the flange or mechanical groove of the nozzle.

Flange Projection or Socket Offset - Displays the project of the flange or offset of the socket for the nozzle.

Flange Width - Specifies the width of the flange of the nozzle.

Flow Direction - Enter the flow direction code for the port. Specifying the correct flow direction code for each part port is very important because the software automatically orients the part to the flow direction of the pipe or port that the part is connected to. Valid codes are listed in the **AllCodeLists.xls** workbook on the **Flow Direction** sheet in the **Codelist Number** column.

Hub Outside Diameter - Displays the outside diameter of the hub for the nozzle.

Linear Thickness at Face of Flange - Displays the thickness of the flange face for the nozzle.

Linear Thickness at Inside Diameter - Displays the thickness of the inside diameter of the nozzle.

Name - Specifies the name of the port. This name is usually generated by the active name rule. You can type a different name for the port. The name must be unique throughout the life cycle of the plant .

Nozzle Length - Type the measurement for the nozzle length.

Nominal Size - Type the nominal size of the port.

Nominal Width - Type the nominal width of the cable tray port.

Nominal Depth - Type the nominal depth of the cable tray port.

NPD Unit Type -Enter the units for the **NPD** column. For example, type **mm** or **in**.

Piping Outside Diameter - Displays the outside diameter of the piping for the nozzle.

Piping Point Basis - Type the piping point basis code that identifies the function of the port. Valid codes are listed in the **AllCodeLists.xls** workbook on the **Piping Point Basis** sheet in the **Codelist Number** column.

Port Depth - Specifies the depth of the port.

Port Index - Specifies the index number for the port.

Port Type - Type the electrical port type of the nozzle.

Pressure Rating - Enter the pressure rating code for the part port. Valid codes are listed in the **AllCodeLists.xls** workbook on the **Pressure Rating** sheet in the **Codelist Number** column.

Raised Face or Socket Diameter - Displays the diameter of the raised face or socket of the nozzle.

Rating Practice - Specifies the rating practice for the nozzle

Reinforced Wall Thickness - Displays the thickness of the reinforced wall of the nozzle.

Schedule Practice - Specifies the schedule practice for the nozzle.

Schedule Thickness - Type the schedule thickness short description or code for the part port. Valid codes and short descriptions are listed in the **AllCodeLists.xls**

workbook on the **Schedule Thickness** sheet in the **Codelist Number** and **Schedule Thickness Short Description** columns.

Seating or Groove or Socket Depth - Displays the depth of the seating, groove, or socket of the nozzle.

Shape Depth - Displays the depth of the nozzle shape.

Shape Width - Displays the width of the nozzle shape.

Sub Type - Specify the electrical sub-type of the nozzle.

Terminal - Specify the type of terminal electrical connection for the port.

Termination Class - Specifies the termination class for the nozzle.

Termination Subclass - Specifies the termination sub-class for the nozzle.

Thickness - Specifies the thickness of the nozzle.

Tightness - Type the tightness of the nozzle.

Wall Thickness or Groove Setback - Displays the thickness of the wall or the setback of the groove for the nozzle.

Position and Orientation

East - Displays the distance of the connection point from the active coordinate system in the east direction.

North - Displays the distance of the connection point from the active coordinate system in the north direction.

Elevation - Displays the distance of the connection point above or below the active coordinate system.

Bearing - Displays the bearing angle for the nozzle.

Pitch - Displays the pitch angle for the nozzle.

Roll - Displays the roll angle for the nozzle.

Related Topics

Select Nozzle Dialog Box

Specifies the nozzle needed for placement. This dialog box appears when you click **From Catalog** on the **Nozzle Properties** dialog box. By browsing through the part

hierarchy, you can find any nozzle in the Catalog database. After you select a nozzle, the software returns you to the **Nozzle Properties** dialog box.

Back - Returns you to the previously selected nozzle. Use this command to navigate through the hierarchy to the specific part that you need.

Forward - Sends you to the last selected nozzle that you moved away from by using the **Back** button. Use this command to navigate through the hierarchy to the specific part that you need.

Up One Level - Brings up the next highest level of the Catalog hierarchy. Use this command to navigate through the hierarchy to the specific part that you need.

Properties - Displays the nozzle properties as defined in the catalog.

Preview - Displays a bitmap symbol of the selected nozzle. The image file must be assigned to the nozzle in the catalog reference data.

List View - Sets the dialog box to display nozzles in a list view.

Grid View - Sets the dialog box to display nozzles in a spreadsheet-style grid view.

Related Topics
- *Occurrence Tab (Nozzle Properties Dialog Box)*, page 119

Location Tab (Nozzle Properties Dialog Box)

Sets options for placing a nozzle on a designed equipment object.

Placement Type - Specifies a location type for the nozzle. The following location types are available for nozzles:

Placement Type	Description
Radial	Straight nozzle with nozzle centerline on the radial plane.
Tangential	Straight nozzle on the radial plane, but the nozzle centerline does not intersect the vessel axis.
Axial	Straight nozzle normal to radial plane.
Skew	Straight nozzle that is tilted from both the radial plane and the vessel axis.
Axial Elbow	Elbow nozzle with hub centerline normal to the radial plane.
Radial Elbow	Elbow nozzle placed with the hub radial to the vessel axis.
Offset Radial Elbow	Elbow nozzle placed with the hub tangential to the vessel axis.
Offset Skew	Skew nozzle with a parallel offset in the radial plane.

Position by Plane and Axis	Available with all Nozzles including PipePort (No Added Graphic) and HvacPort (No Added Graphic).
Position by Point	Available with all Nozzles including PipePort (No Added Graphic) and HvacPort (No Added Graphic).

Property - Identifies the location parameters of the selected nozzle.

Value - Shows the current values for all location parameters of the selected nozzle. You can modify these values after the initial placement of the nozzle to reflect exact design needs or deviations from the standard part.

Related Topics
- *Nozzle Properties Dialog Box*, page 119

Correlate Existing Equipment For Use With The Engineering Framework

If the nozzles exist on the equipment and before you correlate it, the software will attempt to correlate the nozzles automatically. Otherwise, you must correlate existing equipment in a two-step process. First, correlate the body. Then, correlate the nozzles in a separate process.

Correlate the Body

1. Select **Correlate to Design Basis**.
2. Select the main equipment body.
3. Select the equipment on the P&ID.

Correlate the Nozzles

1. Select **Correlate to Design Basis**.
2. Select a nozzle on the equipment.
3. Select the corresponding nozzle on the P&ID.

Note

- If the nozzle names in the 3D model and the names identified in the P&ID match, the nozzles will automatically correlate to the correct state (green for data match or red for inconsistence such as a nozzle diameter differs). Select each nozzle that requires updating to approve the correlation (display in green).

Related Topics

- *Correlate Existing Equipment For Use With The Engineering Framework*, page 125
- *Correlate New Equipment For Use With The Engineering Framework*, page 126
- *Update Equipment For Use With The Engineering Framework*, page 127

Correlate New Equipment For Use With The Engineering Framework

1. Select the equipment from the P&ID.

2. Select **Place Equipment** to create the equipment folder.

3. Place the shape, and select the parent.

4. Select the nozzle from the P&ID.

5. Click **Place Nozzle** .

6. Select the designed equipment parent for the nozzle.

7. Position the nozzle on the equipment.

Note

- You must enter all of the size, end preparation, termination class, and rating practice information for the first nozzle that you place. The software reads all subsequent nozzle information directly from the P&ID.

Related Topics
- *Correlate Existing Equipment For Use With The Engineering Framework*, page 125
- *Correlate New Equipment For Use With The Engineering Framework*, page 126
- *Update Equipment For Use With The Engineering Framework*, page 127

Update Equipment For Use With The Engineering Framework

1. Click **Compare to Design Basis**.

2. Select the equipment folder from the **Workspace Explorer**, or select the symbol from the P&ID.

3. Click **Update**.

🖊 Notes

- Updating adjusts all nozzles associated with the main body as well as the equipment body itself.

- If you change dimensions or names of a nozzle, you must update that nozzle separately.

Related Topics
- *Correlate Existing Equipment For Use With The Engineering Framework*, page 125
- *Correlate New Equipment For Use With The Engineering Framework*, page 126
- *Update Equipment For Use With The Engineering Framework*, page 127

Equipment and Furnishings Glossary

A

associativity

A model architecture where the integrity and consistency of the model is guaranteed by the relationships between model entities.

attribute

A single type of non-graphics information that is stored about an object such as diameter or end preparation.

axis

An imaginary line used to define the orientation of a system or object normally defined in terms of an x, y, and z-axis. Some 3-D graphic objects have an associated axis used to define the center or axis for rotations.

B

bulkload

The process by which reference data in Microsoft Excel workbooks is loaded into the Catalog database.

C

codelist

A set of acceptable values for a particular property that can be referred to by an index number or selected in a combo box. For example, the codelist for the material specification allows you to select from a set of standard entries, such as ASTM A183-F316 Stainless Steel.

coordinate system

A geometric relation used to denote the location of points in the model. The most common coordinate system is the rectangular coordinate system, whereby points are located by traversing the X-, Y-, and Z-axes of the model. Normally, coordinate systems have their origin defined as 0,0,0.

D

database

Repository for the product model data. The database contains information to describe individual objects in the data model and the relationships between objects as appropriate.

E

equipment

Pieces that a foundation supports. Examples are engines, generators, pumps, fans, consoles, large valves, large strainers, and winches. Usually, you can find these pieces on a machinery arrangement plan. Equipment is most often associated with a system.

equipment catalog

Catalog of equipment geometry and limited properties that the software uses to identify and visualize equipment and its placement in the model. The catalog is not the source for the total specification and ordering data for the object.

equipment modeler

Facility of the software to create three-dimensional representations of equipment and components for use in defining arrangements.

F

furnishings

Parts, like movable articles and fittings, that normally are not associated with a system (for example, a chair).

I

item

A combination of an element and another type of data, such as a symbol or object.

N

nozzle

A piping connection point to a piece of equipment.

NPD (Nominal Piping Diameter)

The diameter of a pipe.

O

object

A type of data other than the native graphic format of the application.

occurrence (of part or equipment)

Instantiation of a part or equipment in the plant that refers to the part library; an instance of a specific object. The design can be built several times and therefore the occurrence can apply to more than one hull. Typically, an occurrence points back to a specific object, either for its complete definition, as in the case of a particular valve, or for its made from material, as in the case of a steel plate part cut from sheets. Thus, when a designer selects a component from the catalog and places it at a location in the

space of the plant, the software creates an occurrence of that object in the plant design.

occurrence property

A characteristic that applies to an individual object in the model. Occurrence properties are designated with oa: in the reference data workbooks. You can view and modify occurrence properties on the **Occurrence** tab of the properties dialog boxes in the software. Depending on the object, some occurrence properties are read-only.

P

P&ID

Diagram that shows the topology, functional components, and special requirements of a piping system; generally represents the engineering design of the system.

parameter

A property whose value determines the characteristics or behavior of something.

part class

A group of similar objects. You can define part classes in the Excel workbooks. A part class can have multiple parts. For example, a heat exchanger part class can contain heat exchangers with different dimensions.

part number

Unique identifier of a part.

S

slope

The degree of incline of a roof, expressed as a ratio of the vertical rise to the horizontal run.

T

task

Various design environments in the software application; an ActiveX object that you can plug into an application framework that represents a set of commands, toolbars, ribbons, and views necessary to perform a set of functionality. Previously called applet and user environment.

task area

Area of the workspace that displays the list of currently available tasks.

W

weight and CG analysis

Routines that compute the weight of commodity materials as configured in a given design (for example, plate and pipe) and determine total weight and center of gravity (CG) for a collection of material and equipment, as well as the complete plant.

workspace

Area that represents the portion of the plant data needed to perform the intended task and includes the user modeling settings.

Workspace Explorer

Tree or list representation of objects in your workspace.

X

X-section

Cross section; a graphically placed cross section representing the member section size.

Index