

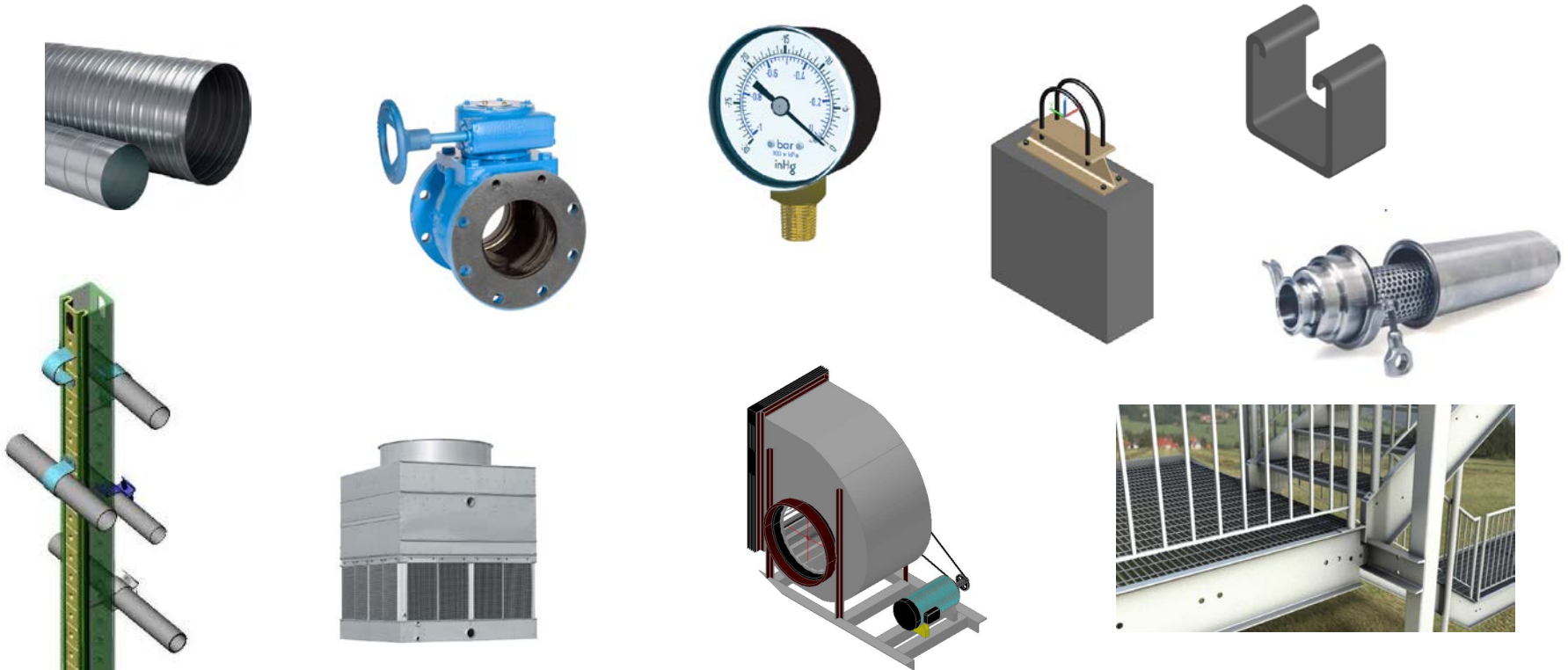
GET Smart
Educating Unintelligent Objects

Sonia Delgadillo

Educating Unintelligent Objects



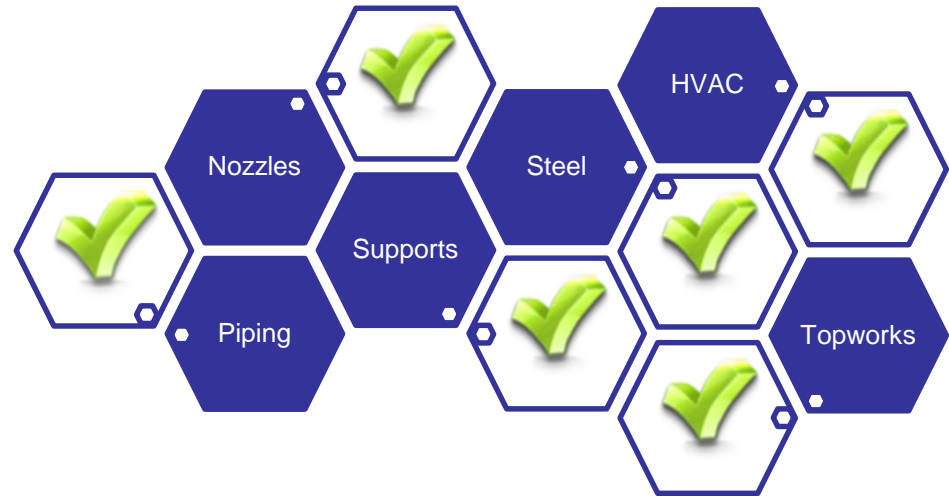
- CADWorx provides fast implementation for adding custom components to the catalog and project specification.
- CADWorx enables you to add intelligence to AutoCAD 3D Solids.



GET Smart



- Piping User Shapes
- Topworks User Shapes
- Piping Generic Attach
- Support User Shapes
- Nozzle Generic Attach
- Steel User Shapes
- Steel Generic Attach
- HVAC User Shapes
- HVAC Generic Attach
- Questions





- **Piping User Shapes**
 - Overview
 - Guidelines
 - Dialog
 - Workflow
 - Examples
- Topworks User Shapes
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Piping User Shapes: Overview

- Some components simply cannot be created using the standard component data tables.
- USERCREATE creates Piping User Shapes for intelligent specification based modeling. 2D symmetrical profiles or AutoCAD 3D Solids can be used with USERCREATE.





Piping User Shapes: Guidelines

- The current Project Specification will be used by CADWorx to automatically add all user shapes.
- The components used to define a CADWorx user shape will be automatically deleted from current source drawing and sent to the predefined project directory.
- Piping User Shapes can be stored in any drive and directory through the Define User Shape dialog and through the CADWorx catalog file. Example: *F:\CADWorx\User Shapes**.
- Connection points define initial drawing direction and enhanced grip location for routing. The end-type selection controls how routing will work from the Piping User Shape grips.
- Piping User Shapes update dynamically with CHANGESIZE and CHANGESPEC (conditional to size availability).
- Piping User Shapes are intelligent CADWorx based shapes. Bills of material, center of gravity reporting, and isometric generation can be performed on the user shape.

Piping User Shapes: Define User Shape Dialog



1. Component Setup

- Name, Specification, Save to Catalog

2. Folder Settings

- Define User Shape directory

3. Description

- Long, Short, Tag, Note

4. ISOGEN Symbol Information

- Isometric Symbol Key designation

5. Define Size and Geometry

- 3D Solid block selection and define connections and component end-types

6. Rating

- Class, Temperature and Pressure Rating

7. Spec Properties

- BOM Type, Color, Layer, Material, Density, Weight, Length and Optional setting

The screenshot shows the 'Define User Shape' dialog box with the following sections and callouts:

- 1** Component Setup: Name, Number (USER SHAPE 1), Specification (150), Save to catalog checkbox.
- 2** Folder Setting: Folder path (c:\advorx\2014\plant\Spec) and Browse button.
- 3** Description: Long, Short, Tag, and Notes text boxes.
- 4** ISOGEN Symbol Information: Identifier (MULTI-PORT-COMPONENT), SKEY (XVFL (MULTI-PORT-COMPONENT)), Rating (Component Class: 150, Temperature Rating, Pressure Rating).
- 5** Define Size and Geometry: Type (Block), Main Size (6"), Reduction Size, and buttons for Select 3D Solid, Select 2D Double Line, Select 2D Single Line, and Define Connections.
- 6** Rating: Component Class, Temperature Rating, and Pressure Rating.
- 7** Spec Properties: BOM Type (Fabrication), Color (ByLayer checkbox), Layer (150), Material, Density (1), Weight (1), Length (1), Sort Sequence (103), and Optional component checkbox.

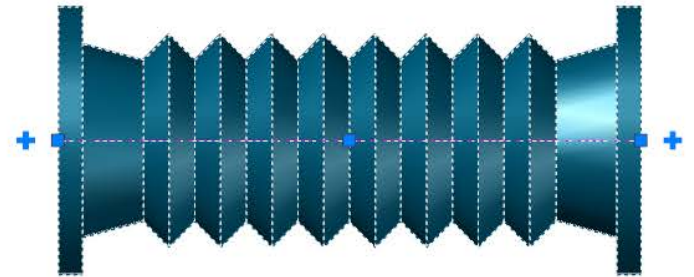
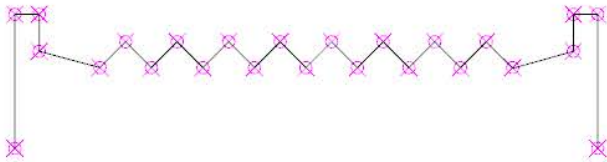


Piping User Shapes: Workflow

- Create 2D symmetrical profile or 3D Solid Piping User Shape
 - 2D symmetrical profiles must be joined into an AutoCAD Polyline
 - Select Points – This creates a 2D symmetrical profiles that will be revolved
 - 3D user shapes should have centerline included. Centerline is not necessary.
 - Select Polyline – This creates a 2D symmetrical profiles that will be revolved
 - Select Block – This creates a 3D specification shape
- Outline details in Define User Shape dialog
 - Component table name
 - Project specification and size
 - Folder directory
 - Define end connections and end-types
 - Selection establishes line of symmetry
 - Selection controls ISOGEN symbol output and piping grips for modeling
 - Piping user shape is automatically added to current specification
 - Description
 - ISOGEN Symbol Information
 - Rating
- Route and Insert Piping User Shape

Piping User Shapes: Example (1 of 3)

Select Point



Piping User Shapes: Example (1 of 3)

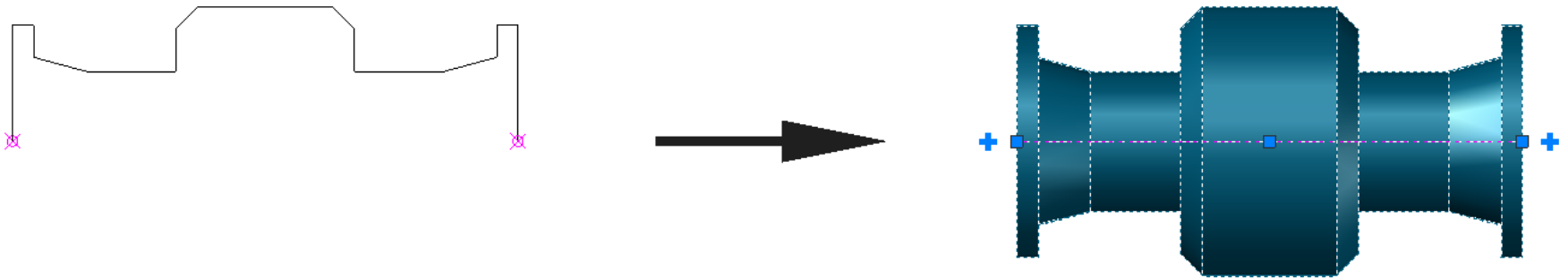
Select Point



The screenshot displays the AutoCAD 2014 software interface. The title bar reads "Autodesk AutoCAD 2014 - NOT FOR RESALE Pick Points Method.dwg". The ribbon is set to "CADWorx Plant I". The left-hand "CADWorx Spec View" panel shows a specification for a pipe with a size of 6" and a specification of 150. Below this, a list of components is visible, including various pipe fittings and valves. The main workspace shows a piping layout with a grid of points marked by purple 'X' symbols. A mouse cursor is positioned over one of these points, indicating it is selected. The bottom status bar shows the command line with the text "Command: _USERCREATE" and "Type a command".

Piping User Shapes: Example (2 of 3)

Select Polyline



Piping User Shapes: Example (2 of 3)

Select Polyline



The screenshot displays the AutoCAD 2014 interface with the CADWorx Plant I tab active. The main drawing area shows a piping diagram with a central horizontal section and two vertical sections extending downwards. A mouse cursor is positioned over a point on the top horizontal section of the piping. The left-hand side of the interface features the CADWorx Spec View panel, which includes a tree view of piping components and a table for specifying size and specification. The command line at the bottom shows the command `_USERCREATE` being entered.

CADWorx Spec View

SIZE	SPEC
6"	1/8"
150	

Tree View:

- PIPE, SMLS, SCH STD, ASTM A106 GR B [0.125-20,24]
- 45 ELL, SCH STD, ASTM A234 GR WPB [0.5-20,24]
- 90 LR ELL, SCH STD, ASTM A234 GR WPB [0.5-20,24]
- 180 LR RETURN, SCH STD, ASTM A234 GR WPB [0.5-20,24]
- TEE, SCH STD, ASTM A234 GR WPB [0.5-20,24]
- CAP, SCH STD, ASTM A234 GR WPB [0.5-20,24]
- CROSS, SCH STD, ASTM A234 GR WPB [1.25-20,24]
- LATERAL, SCH STD, ASTM A234 GR WPB [1-20,24]
- STUB END, SCH STD, ASTM A234 GR WPB [0.5-20,24]
- FLG LONG WELD NECK, 150LB [1-20,24]
- FLG WELD NECK, 150LB, SCH STD, ASTM A105 [0.5-20,24]
- FLG SLIP ON, 150LB, ASTM A105 [0.5-20,24]
- FLG BLIND, 150LB, ASTM A105 [0.5-20,24]
- FLG LAP JOINT, 150LB, ASTM A105 [0.5-20,24]
- STUD BOLTS W/ NUTS, LENGTH_CMP_TBL LG, ASTM A193 [0.5-20,24]
- GASKET, 150LB, 1/8" THK [0.5-20,24]
- BLEED RING, 150LB [0.5-20,24]
- BALL VALVE, FLG, 150LB [0.5-1,1.5-3,4,6-8]
- BUTTERFLY VALVE, WAFER, 150LB [3,4,6-20,24]
- CHECK VALVE, FLG, 150LB [2-3,4-16]
- GATE VALVE, FLG, 150LB [2-3,4-20,24]
- GLOBE VALVE, FLG, 150LB [2-3,4-14]
- PLUG VALVE, FLG, 150LB [1,1.5-3,4,6-12]
- 3-WAY VALVE, FLG, 150LB [1.5-2,3,4,6-12]
- 4-WAY VALVE, FLG, 150LB [1.5-2,3,4,6-12]
- CONTROL VALVE, FLG, 150LB [0.75-3,4-12,16]
- STRAINER, FLG, 150LB [1.5-20,24]
- ANGLE VALVE, FLG, 150LB [2-3,4-12]
- SPECTACLE BLIND, 150LB, ASTM A105 [1,1.5-3,4,6-20,24]
- EXPANSION JOINT, FLG, 150LB [1-20,24]
- 6" Flexible Coupling [6]
- WELD GAP, 1/8" THK [2-20,24]

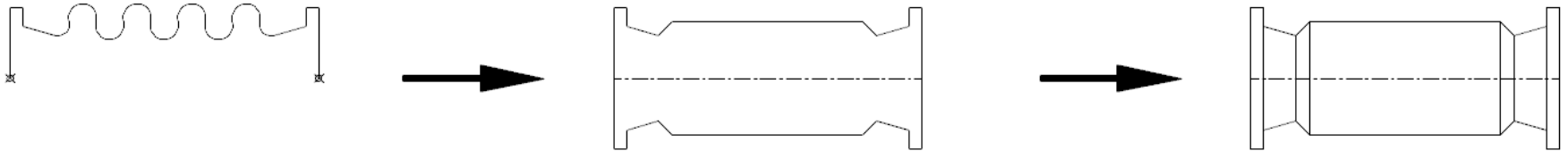
Command Line: Command: `_USERCREATE`

Piping User Shapes: Example (3 of 3)

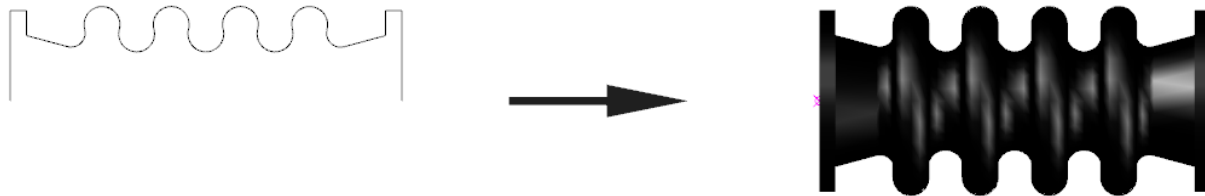
Select Block



- AutoCAD Arc objects will fail with Select Polyline Option



- Use AutoCAD REVOLVE command. The revolved object turns into an AutoCAD 3D object that can be used with Select Block.



Piping User Shapes: Example (3 of 3)

Select Block



The screenshot displays the Autodesk AutoCAD 2014 interface with the CADWorx Plant I ribbon active. The main workspace shows a 3D model of a piping assembly with five vertical cylindrical vessels connected by horizontal pipes. The CADWorx Spec View panel on the left lists various piping components such as PIPE, ELBOWS, VALVES, and FLANGES. The command line at the bottom shows the command: `Command: ._.erase 1 found`.



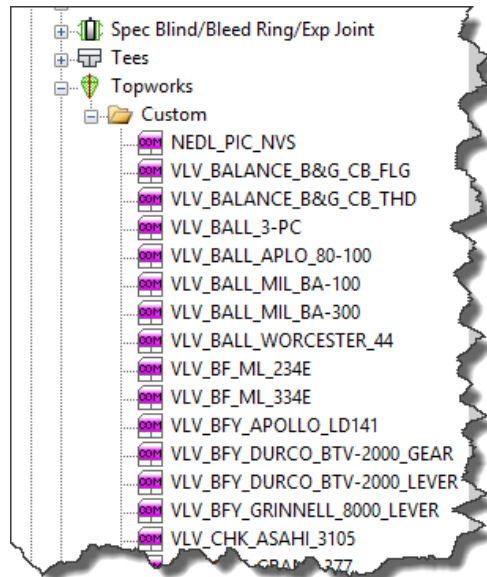
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Topworks User Shapes: Overview

- Valve operator and valve body geometry must be represented accurately if the model will undergo 3D clash detection.
- Topworks User Shapes allow CADWorx to graphically display valves with unique actuators, and drive their insertion automatically through the catalogs and the specifications .





Topworks User Shapes: Guidelines

- The origin (0,0,0) is the assumed insertion point for topworks (center of valve).
- Any 3D Solid content can be used as a Topworks User Shape.
- The Topworks User Shapes are size specific. One component per size is required for each topworks shape.
- The Topworks User Shapes update dynamically with CHANGESIZE and CHANGESPEC (conditional to size availability).
- Topworks User Shapes are represented on ISOGEN isometric drawings as a predefined spindle with a direction.
- The location of the topworks is defined through the Catalog that is used by the Project Specification.
- Topworks User Shapes drawings can be stored in any drive and directory: *F:\CADWorx\Topworks**.



Topworks User Shapes: Table

- The rotation can be free along the Z axis and X axis.
 - Rotation set to “0” allows rotation along the Z axis.
 - Rotation set to “1” allows rotation along the Z axis and X axis.

MAINSIZE /	SUBDIRECTORY	DWGNAME	ROTATION	WEIGHT	Manufacture
2.0000	C:\CustomTopwork_I	_Sample_CustomTop1.dwg	0	0	
4.0000	C:\CustomTopwork_I	_Sample_CustomTop1.dwg	1	0	
6.0000	C:\CustomTopwork_I	_Sample_CustomTop1.dwg	1	0	
8.0000	C:\CustomTopwork_I	_Sample_CustomTop2.dwg	0	0	
12.0000	C:\CustomTopwork_I	_Sample_CustomTop2.dwg	0	0	
16.0000	C:\CustomTopwork_I	_Sample_CustomTop3.dwg	0	0	
20.0000	C:\CustomTopwork_I	_Sample_CustomTop3.dwg	0	0	
24.0000	C:\CustomTopwork_I	_Sample_CustomTop3.dwg	0	0	

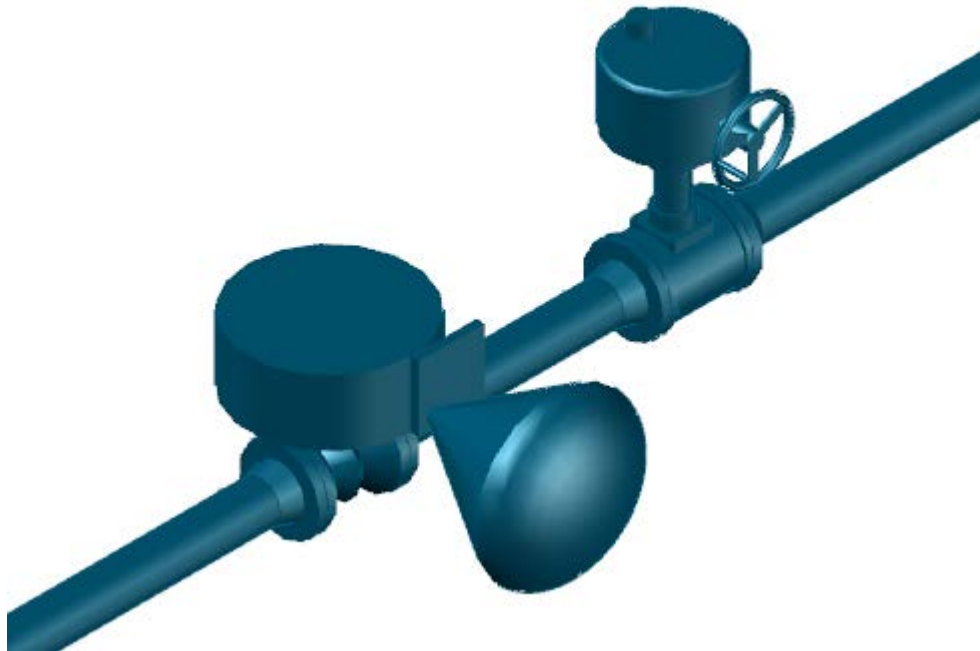


Topworks User Shapes: Workflow

- Create 3D Solid Topworks User Shapes
- Define new custom topworks in the Catalog
- Add topworks to a valve component in the Project specification
- Route and insert Topworks User Shape



Topworks User Shapes: Example



Topworks User Shapes: Example



Intergraph CADWorx Catalog and Specification Editor 2015 Alpha [VCI0-RELEASE-32 bit] - C:\CADWorx 2015\Plant\Spec\Inch_Catalog.cat

Language

Clipboard

Size Table Bolt Diameter Table Bolt Length Table Material Table Schedule Table Thickness Table End Type Table Category Table Data Table IndexCode Table DBCode Table End Prep Table

Import By Spec Import From Data File Pipe Support Import Assembly Pipe Support Import Data Catalog Project Data Project Data Transfer Data Export Table To Text Excel Export Data Exit Spec Editor

Catalog Data

- Inch_Catalog.cat
 - Size Tables
 - Material Tables
 - Schedule Tables
 - Thickness Tables
 - EndType Tables
 - Data Tables
 - Elbows
 - Valves
 - Spec Blind/Bleed Ring/Exp Joint
 - Gaskets/Bolts/Welds
 - Reducers
 - Caps
 - Couplings
 - Crosses
 - O-Lets
 - Flanges
 - Laterals
 - Pipe
 - Strainers
 - Tees
 - Unions
 - Topworks
 - Actuator
 - Custom
 - _Sample_Custom_I_top
 - Custom2
 - Gear1
 - Gear2
 - GearActuator
 - Lever1
 - Lever2
 - Wheel
 - PipeSupport
 - IndexCode Tables
 - DBCode Tables
 - Miscellaneous Tables

1 item selected

CAP | NUM | SCRL



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Piping Generic Attach: Overview

- Incidental items such as pressure gauges are sometimes important to show in the model and often they are needed in the piping bills of material.
- GENERIC attaches intelligent CADWorx piping XDATA information to any generic AutoCAD object in the drawing.



Piping Generic Attach: Guidelines



- Piping Generic Attach components are intelligent CADWorx shapes.
- Bills of material, database reporting, and isometric generation can be performed on the Piping Generic Attach shape.
- The Bill of Material (BOM) mark point and Center of Gravity (CG) location point can be redefined.
- The Piping Generic Attach shapes do not update with CHANGESIZE and CHANGESPEC.
- The Piping Generic Attach shapes inherit their size and spec from the currently selection in the CADWorx Spec View Palette.
- Double-click to modify size and details of shape.
- Intelligence can be removed at any time from shapes.
- Piping Generic Attach shapes do not have an ISOGEN Symbol shape assigned and will not appear on the isometric drawing area.
 - The data will appear in the bill of material on the isometric drawing.

Piping Generic Attach: Dialog



Generic Attach [X]

Alpha size:

Short annotation:

Long annotation:

Line number:

Tag:

Code:

Weight:

Sort sequence:

Length:

Component type:

Specification

BOM Item Type

- Fabrication
- Erection
- Offshore
- Misc

Coordinates

- World
- Iso

Miscellaneous

- Existing

ISOGEN Custom Data Remove BOM/CG Point

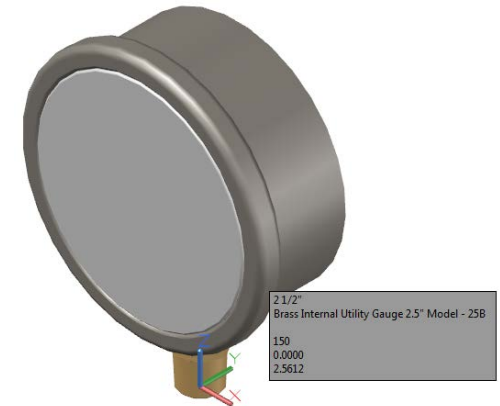
Attach Cancel Exit Help



Piping Generic Attach: Workflow

- Create 3D Solid Piping Generic Attach Shape
- Enter Data in the Generic Attach Dialog
- If necessary, modify the Bill of Material (BOM) Mark Point and the Center of Gravity (CG) Location
- Reuse Piping Generic Attach Shape by copying and pasting

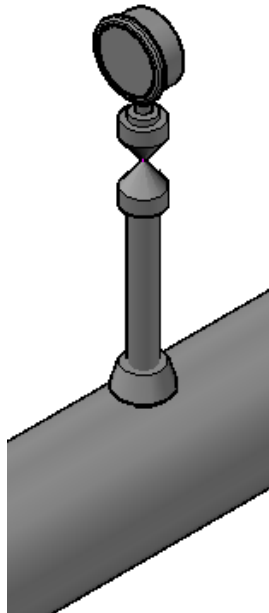
BILL OF MATERIAL				
MARK	QTY	SIZE	DESCRIPTION	LENGTH
1	1	2 1/2"	Brass Internal Utility Gauge 2.5" Model - 25B	0"





Piping Generic Attach: Example

- By using 3D vendor data, gauges can be accurately represented and placed into the CADWorx plant model. Generic attach allows the component information to be associated with the gauge geometry for inclusion in BOM Reports.



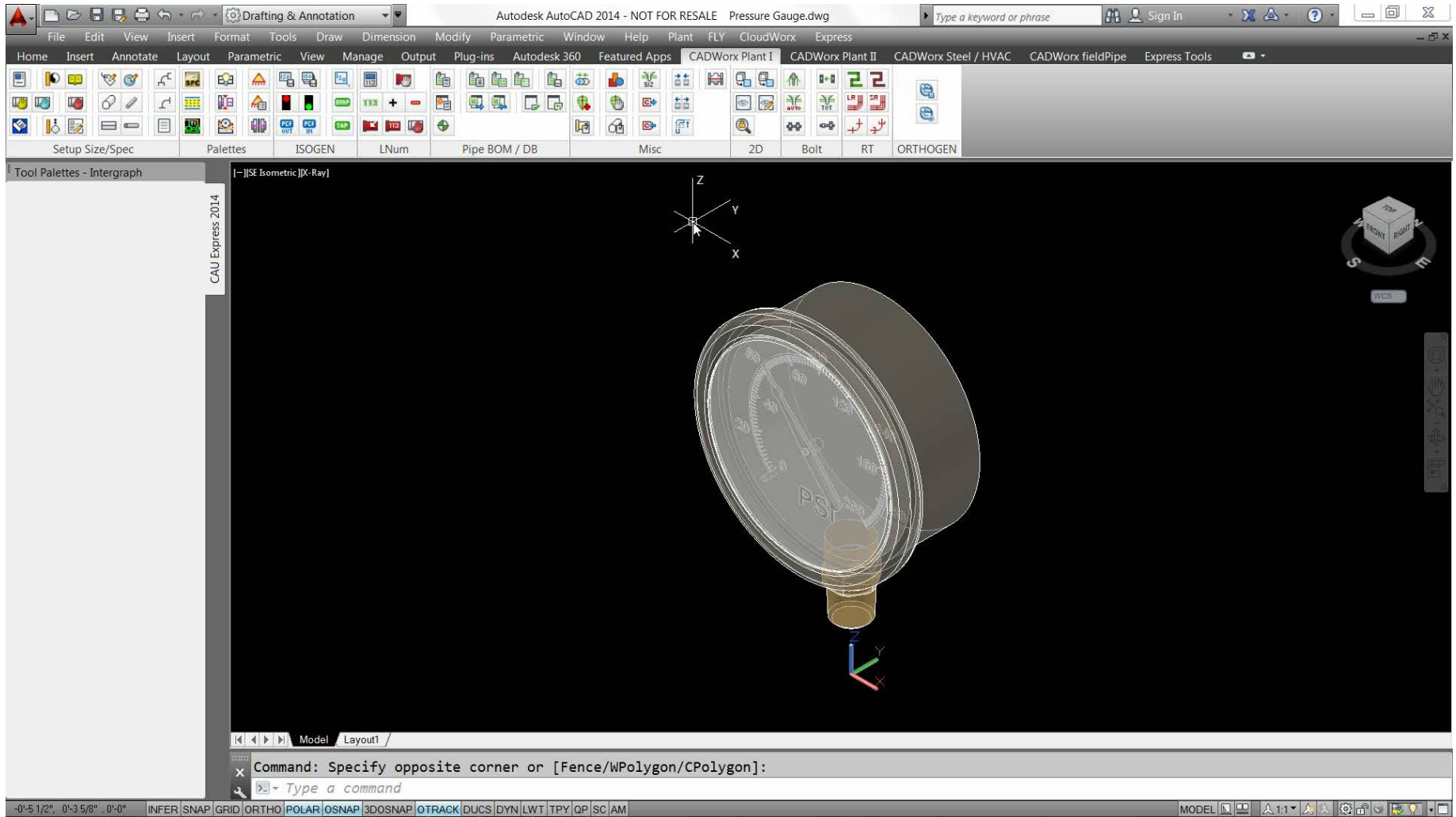
Component Edit (1 of 1)

Alpha size:	1/4"
Short annotation:	Pressure Gauge
Long annotation:	Brass Internal Utility Gauge, 2.5", Model 25B, 1/4" NPT
Line number:	
Tag:	PG-1
Code:	25B
Weight:	0.00000
Sort sequence:	0
Length:	0.00000
Component type:	Generic Insert (Command=GENERIC) (English/Inch) (Pro)
Specification	150
Coordinates	<input checked="" type="radio"/> World <input type="radio"/> Iso
Miscellaneous	<input type="checkbox"/> Existing
BOM Item Type	<input checked="" type="radio"/> Fabrication <input type="radio"/> Erection <input type="radio"/> Offshore <input type="radio"/> Misc

ISOGEN Custom Data Remove BOM/CG Point
OK Cancel Exit Help



Piping Generic Attach: Example





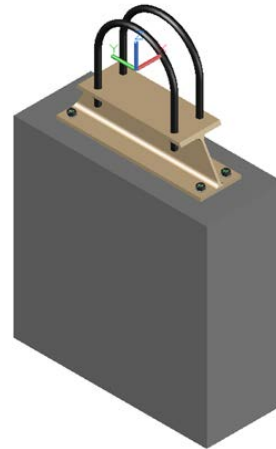
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Support User Shapes: Overview

- Specially-shaped supports such as Pipeline Sleepers are often shown in a plant model and needed in a piping Bill Of Material Report. There are a variety of configurations and products that meet this support requirement, but they cannot be built using standard data tables.
- Support User Shapes allow CADWorx to insert and schedule intelligent specially-shaped supports from the catalogs and specifications.





Support User Shapes: Guidelines

- Any 3D Solid drawing content can be used as a pipe support.
- The origin (0,0,0) is the assumed insertion point for supports.
- One custom pipe support shape may be used for all sizes (using scale factors).
- Determine custom pipe support scale for all catalog sizes.
- Custom Pipe Support drawings can be stored in any drive and directory: *F:\CADWorx\Pipe Supports**.
- Predetermined Part Numbers, Length and Weight can be applied.
- Support User Shapes export to CEASAR II.
- Support User Shapes are represented on ISOGEN isometric drawing as a symbol and are listed in the bill of material.



Support User Shapes: Typical Scale Formula



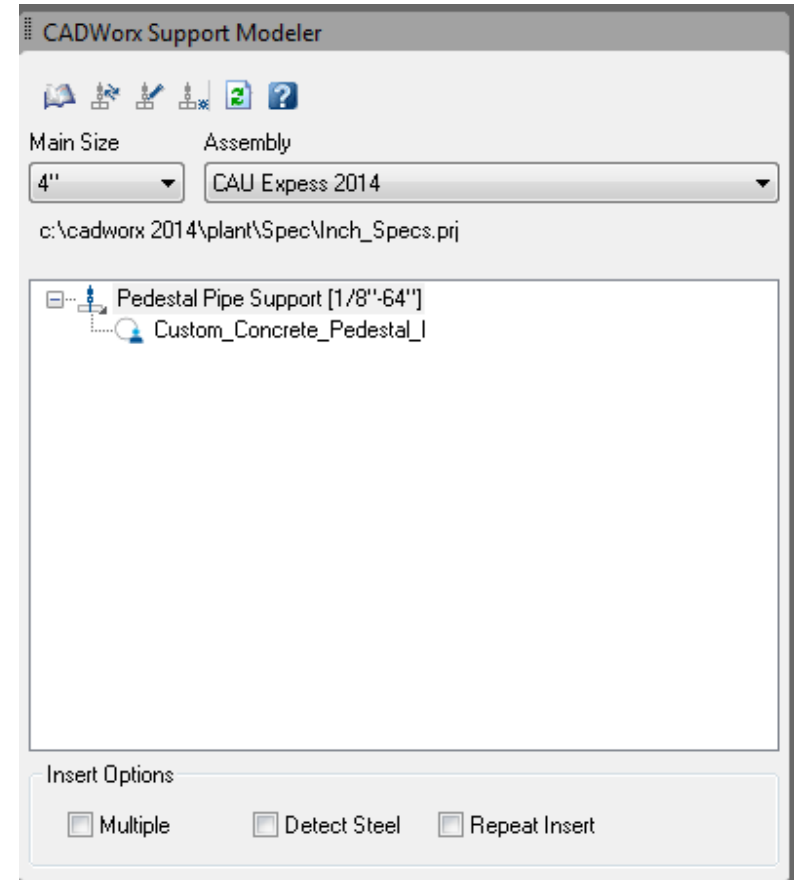
- Target Outside Diameter (OD) / Pipe Support DWG basis OD
 - Pipe Support DWG basis OD = 1.315 (this is the OD of a 1" NPS)
 - 4" NPS scale = 4" OD / basis OD = 4.500 / 1.315 = **3.422**
 - 8" NPS scale = 8" OD / basis OD = 8.625 / 1.315 = **6.559**
 - 12" NPS scale = 12" OD / basis OD = 12.750 / 1.315 = **9.696**
 - 16" NPS scale = 16" OD / basis OD = 16.000 / 1.315 = **12.167**

MAINSIZE	SUBDIRECTORY	DWGNAME	SCALE	LENGTH	WEIGHT	USER_PART_NUMBER
1.0000	Custom_PipeSupport	Custom_Pipe_Support_on_Concrete_Pedestal.dwg	1.0000	2.6300	1.0000	CUST1006
1.2500	Custom_PipeSupport	Custom_Pipe_Support_on_Concrete_Pedestal.dwg	1.262357414	3.3200	1.0000	CUST1007
1.5000	Custom_PipeSupport	Custom_Pipe_Support_on_Concrete_Pedestal.dwg	1.44486692	3.8000	1.0000	CUST1008
2.0000	Custom_PipeSupport	Custom_Pipe_Support_on_Concrete_Pedestal.dwg	1.80608365	4.7500	1.0000	CUST1009
2.5000	Custom_PipeSupport	Custom_Pipe_Support_on_Concrete_Pedestal.dwg	2.186311787	5.7500	1.0000	CUST1010
3.0000	Custom_PipeSupport	Custom_Pipe_Support_on_Concrete_Pedestal.dwg	2.661596958	7.0000	1.0000	CUST1011
3.5000	Custom_PipeSupport	Custom_Pipe_Support_on_Concrete_Pedestal.dwg	3.041825095	8.0000	1.0000	CUST1012
4.0000	Custom_PipeSupport	Custom_Pipe_Support_on_Concrete_Pedestal.dwg	3.422053232	9.0000	1.0000	CUST1013
5.0000	Custom_PipeSupport	Custom_Pipe_Support_on_Concrete_Pedestal.dwg	4.230418251	11.1260	1.0000	CUST1014
6.0000	Custom_PipeSupport	Custom_Pipe_Support_on_Concrete_Pedestal.dwg	5.038022814	13.2500	1.0000	CUST1015
8.0000	Custom_PipeSupport	Custom_Pipe_Support_on_Concrete_Pedestal.dwg	6.558935361	17.2500	1.0000	CUST1016
10.0000	Custom_PipeSupport	Custom_Pipe_Support_on_Concrete_Pedestal.dwg	8.174904943	21.5000	2.0000	CUST1017



Support User Shapes: Workflow

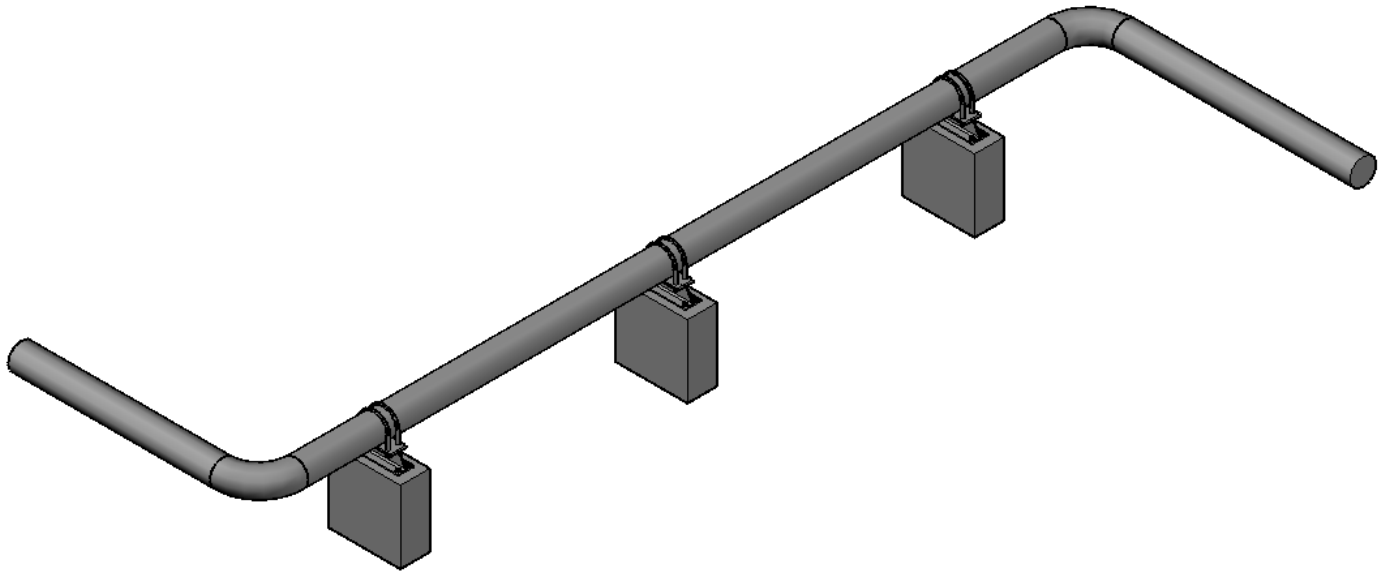
- Create 3D Solid Pipe Support
- Add to Catalog
- Add to Project (PRJ file)
- Route and insert Custom Support



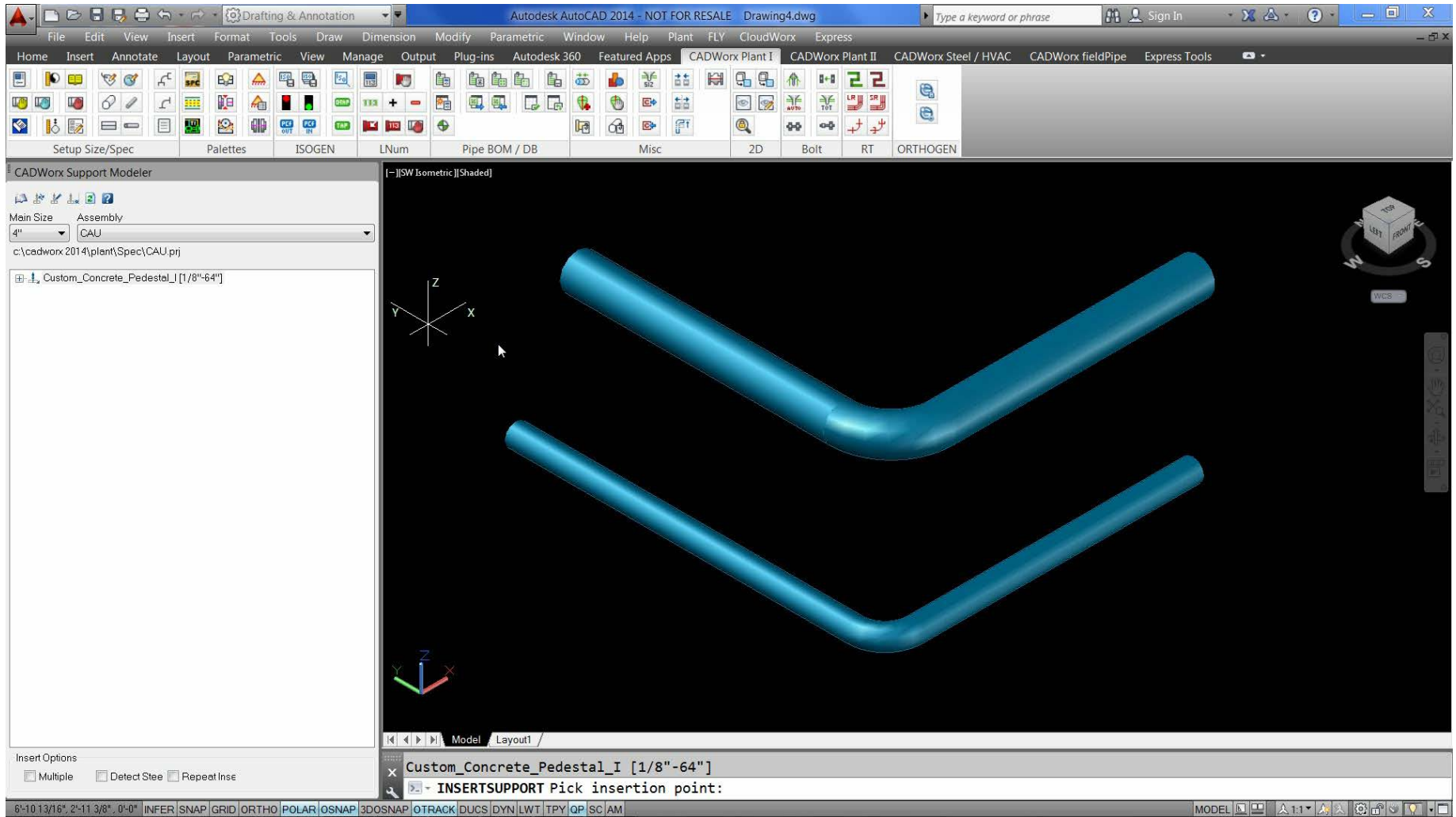
Support User Shapes: Example



[-] [SW Isometric] [Shades of Gray]



Support User Shapes: Example





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Nozzle Generic Attach: Overview

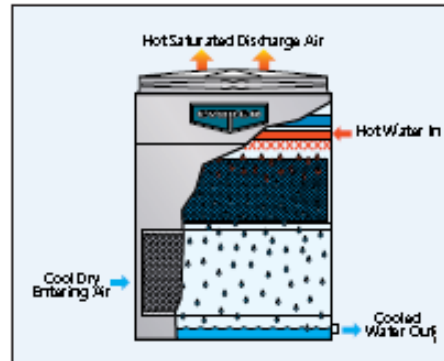
- Equipment such as cooling towers are often part of a plant design and need to be shown in the model. Using vendor 3D models can speed accurately depicting equipment and nozzle connection details, but do not provide connectivity for ISOGEN.
- ENGENERIC assigns intelligence to an equipment nozzle not created with CADWorx Equipment.

MODELS: AT/UT/USS 312-036 to 312-942
Three-Cell Cooling Towers

*312-036 to 312-636
Ø) 8" Inlets
Ø) 8" Outlet

*312-042 to 312-942
Ø) 10" Inlets
Ø) 10" Outlets

Model ID	Weight (LBS)		On Motor (HP)	Air Flow (CFM)	Dimensions												
	Shipping	Operating			H	T	B	P	D	L	AT/USS	BT	II	M	SSO		
AT312-036	2250	4080	16500	3120	270,000	N-3	7'-0"	7'-2 1/4"	Ø 2'-2"	3'-1 1/2"	35'-4 1/4"	T-3 1/4"	12'-3 3/4"	11'-2 3/4"	11'-3 3/4"	5'-11 3/8"	
AT312-135	2250	4200	16500	3120	280,000	N-3	7'-0"	7'-2 1/4"	Ø 2'-2"	3'-1 1/2"	35'-4 1/4"	T-3 1/4"	12'-3 3/4"	11'-2 3/4"	11'-3 3/4"	5'-11 3/8"	
AT312-226	2250	4100	16500	3120	290,000	N-3	7'-0"	7'-2 1/4"	Ø 2'-2"	3'-1 1/2"	35'-4 1/4"	T-3 1/4"	12'-3 3/4"	11'-2 3/4"	11'-3 3/4"	5'-11 3/8"	
AT312-236	2250	4250	16500	3120	295,000	N-3	7'-0"	7'-2 1/4"	Ø 2'-2"	3'-1 1/2"	35'-4 1/4"	T-3 1/4"	12'-3 3/4"	11'-2 3/4"	11'-3 3/4"	5'-11 3/8"	
AT312-435	2600	4300	16500	3120	261,000	N-3	7'-0"	7'-2 1/4"	Ø 2'-2"	3'-1 1/2"	35'-4 1/4"	T-3 1/4"	12'-3 3/4"	11'-2 3/4"	11'-3 3/4"	5'-11 3/8"	
AT312-535	2600	4250	16500	3120	261,000	N-3	7'-0"	7'-2 1/4"	Ø 2'-2"	3'-1 1/2"	35'-4 1/4"	T-3 1/4"	12'-3 3/4"	11'-2 3/4"	11'-3 3/4"	5'-11 3/8"	



Nozzle Generic Attach: Guidelines



- Nozzle Generic Attach components are intelligent connections, allowing connectivity for routing and accurate bolt length calculation.
- ISOGEN connection details will be shown on the isometric drawings.
- Nozzle Generic Attach connections do not update with CHANGESPEC and CHANGESPEC.
- Double-click to modify size and details of shape (including X,Y,Z coordinates).
- Intelligence can be removed at any time from shapes.
- Nozzle Generic Attach components uses an existing nozzle ISOGEN Symbols shape on the isometric drawing area to represent the connection.
- Nozzle Generic Attach component data will not appear in the bill of material reports or on the isometric drawing bill of material.

Nozzle Generic Attach: Dialog



Nozzle Generic Attach (Edit)

Description:

Equipment Name:

Size:

Flange Rating:

Flange Thickness:

Flange Type:

Layer:

Color:

Nozzle insertion point

Face end

Specify On-screen

X:

Y:

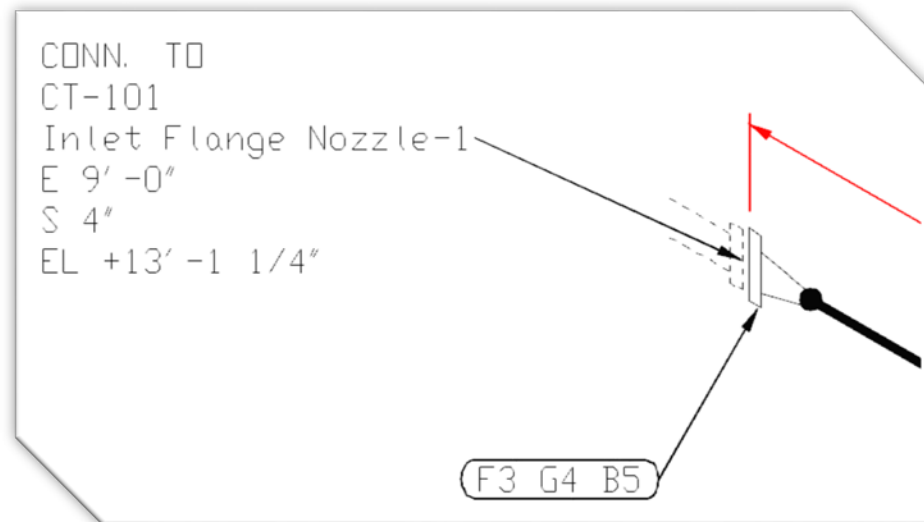
Z:

OK Remove Cancel Help

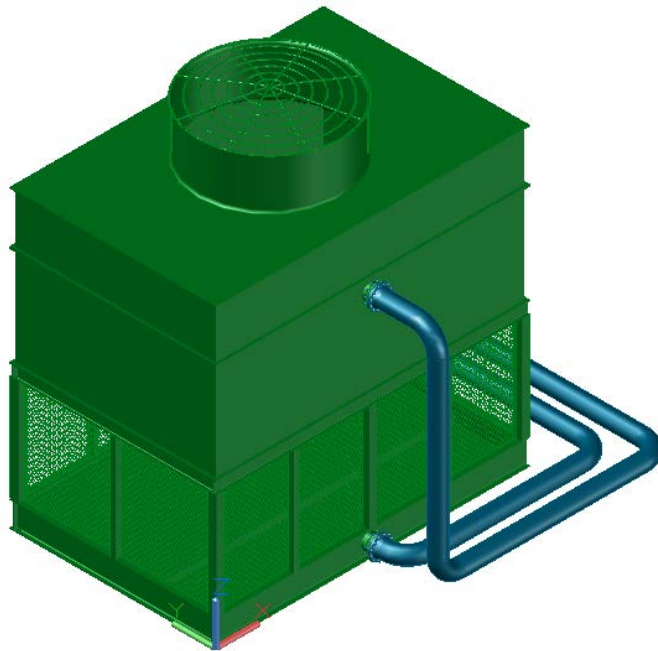


Nozzle Generic Attach: Workflow

- Use a 3D equipment shape (insert block or XREF)
- Select a project, a specification, and a size
- Start ENGENERIC, select nozzle location and orientation, then enter data in dialog box.
- Double-click to modify nozzle connection details.



Nozzle Generic Attach: Example



Nozzle Generic Attach (Edit)

Description: Inlet Flange Nozzle-1

Equipment Name: CT-101

Size: 10"

Flange Rating: 150

Flange Thickness: 1 3/16"

Flange Type: RFWN

Layer: Equip

Color: ByLayer

Nozzle insertion point

Face end

Specify On-screen

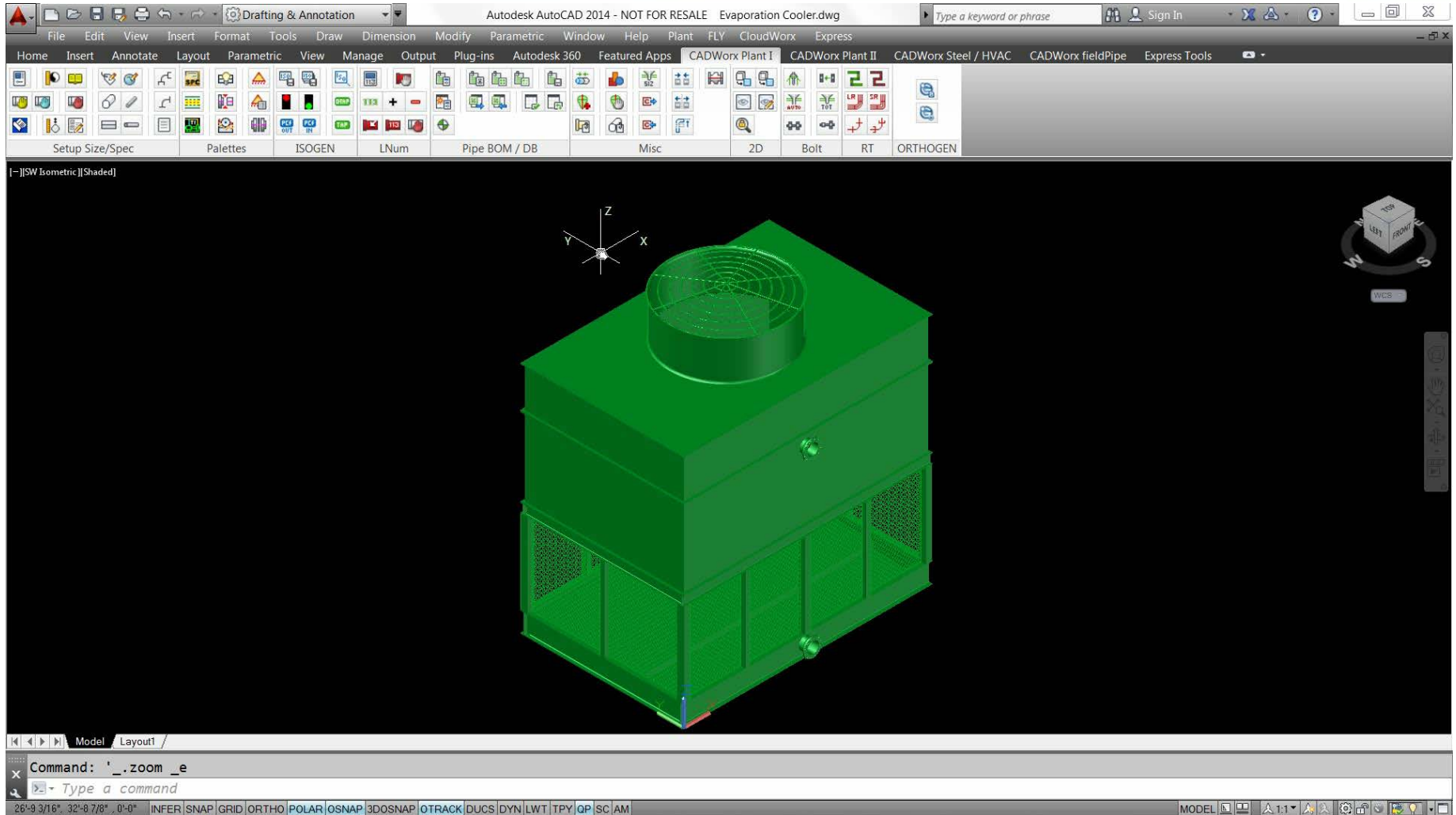
X: 9'

Y: -4"

Z: 13'-1 1/4"

OK Remove Cancel Help

Nozzle Generic Attach: Example





GET Smart

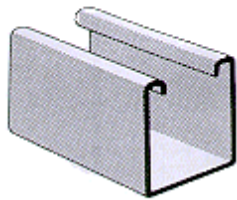
- Piping User Shapes
- Topworks User Shapes
- Piping Generic Attach
- Support User Shapes
- Nozzle Generic Attach
- **Steel User Shapes**
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- Steel Generic Attach
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- HVAC Generic Attach
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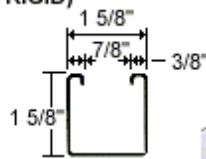
Steel User Shapes: Overview

- Unistrut channel used in Pipe Supports are important to show in the model and include in the bills of material.
- SUSER uses a user-defined 2D profile to make an intelligent steel custom user shape.

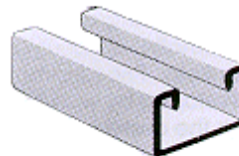
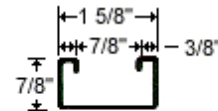
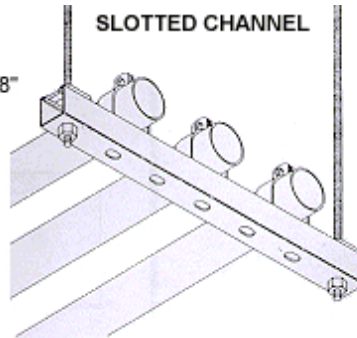
CHANNEL (SLOTTED OR RIGID)



1-5/8" CHANNEL (RIGID)

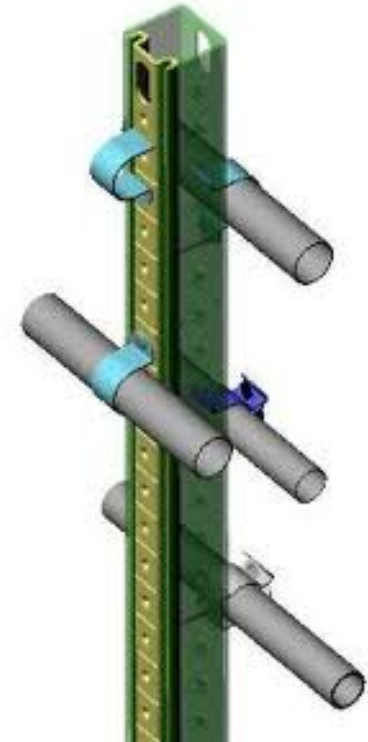
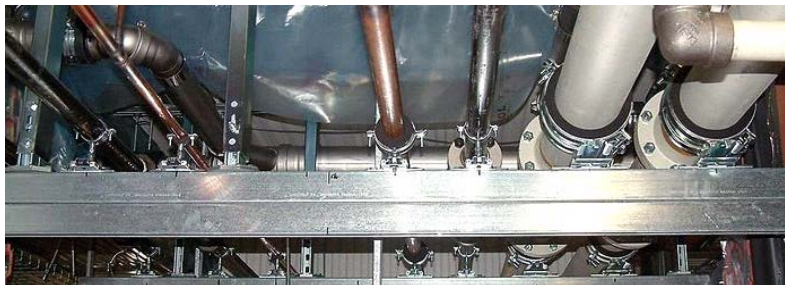


SLOTTED CHANNEL



7/8" CHANNEL (RIGID)

Channels are roll formed from 12 gauge strip steel. Available in 10 and 20 foot lengths.





Steel User Shapes: Guidelines

- The Steel User Shape is size specific. One component per size is required for each Steel User Shape.
- The 2D profile must be a joined AutoCAD 2D polyline.
- The origin (0,0,0) is the assumed insertion point for steel user shapes.
- The Steel User Shape description details found in the drawing will be applied to the intelligent Steel User Shape on insertion.
- Steel User Shape are extruded to predetermined user length.
- The Steel User Shapes are intelligent CADWorx steel shapes. Bills of material can be performed on the Steel User Shapes.
- The Steel User Shapes graphics are not maintained through SDBFIN, **SEXPORT** or **SIMPORT**. Only CADWorx Steel program steel shapes will be regenerated on import.
- The Steel User Shape drawing location must be stored in the path..*<SteelLibraryDirectory>\User Shapes* (based on the CFG file).

Steel User Shapes: Dialog



Steel User Shapes

Select Directory: User Shapes

Select Member:

- Sample_1 |
- Sample_2_1
- Sample_3_1
- Sample_4_1
- Sample_5_1

Details:

Short annotation: Sample One

Long annotation: Sample One

Description: Sample One

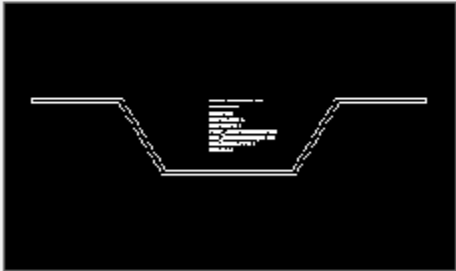
Part number: PT # 1

Material: MAT 1

Length: Manual Update

Weight: 0.000 Manual Update

Roll Angle: 0



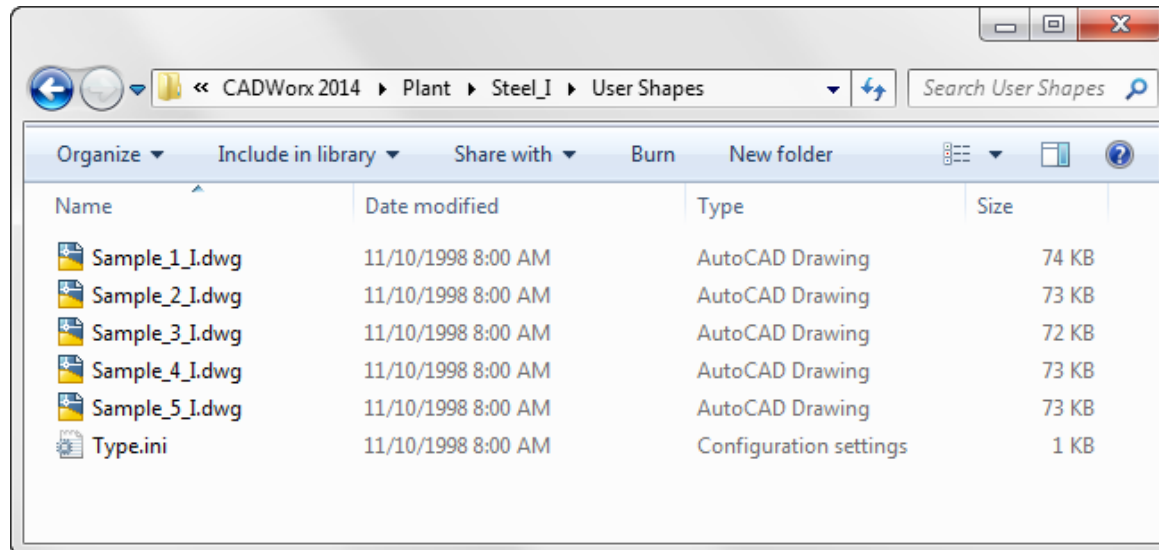
Pick points Select line Help

OK Cancel Exit



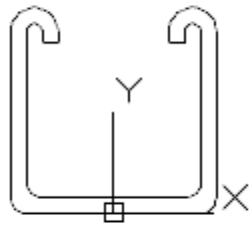
Steel User Shapes: Workflow

- Create 2D Steel User Shape
- Add Steel User Shape drawing to the User Shape directory
- Choose SUSER shape from dialog
- Insert Custom Steel User Shape in CADWorx
- MOVE, COPY, ARRAY
- Generate bills of material





Steel User Shapes: Example



DESCRIPTION=Unistrut Solid Framing Channel

UNITSYSTEM=1

DENSITY=1.0

MATERIAL=MAT 1

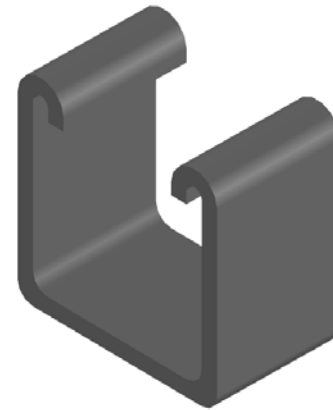
PAINT=PNT # 1

SHORT_ANNOTATION=Unistrut

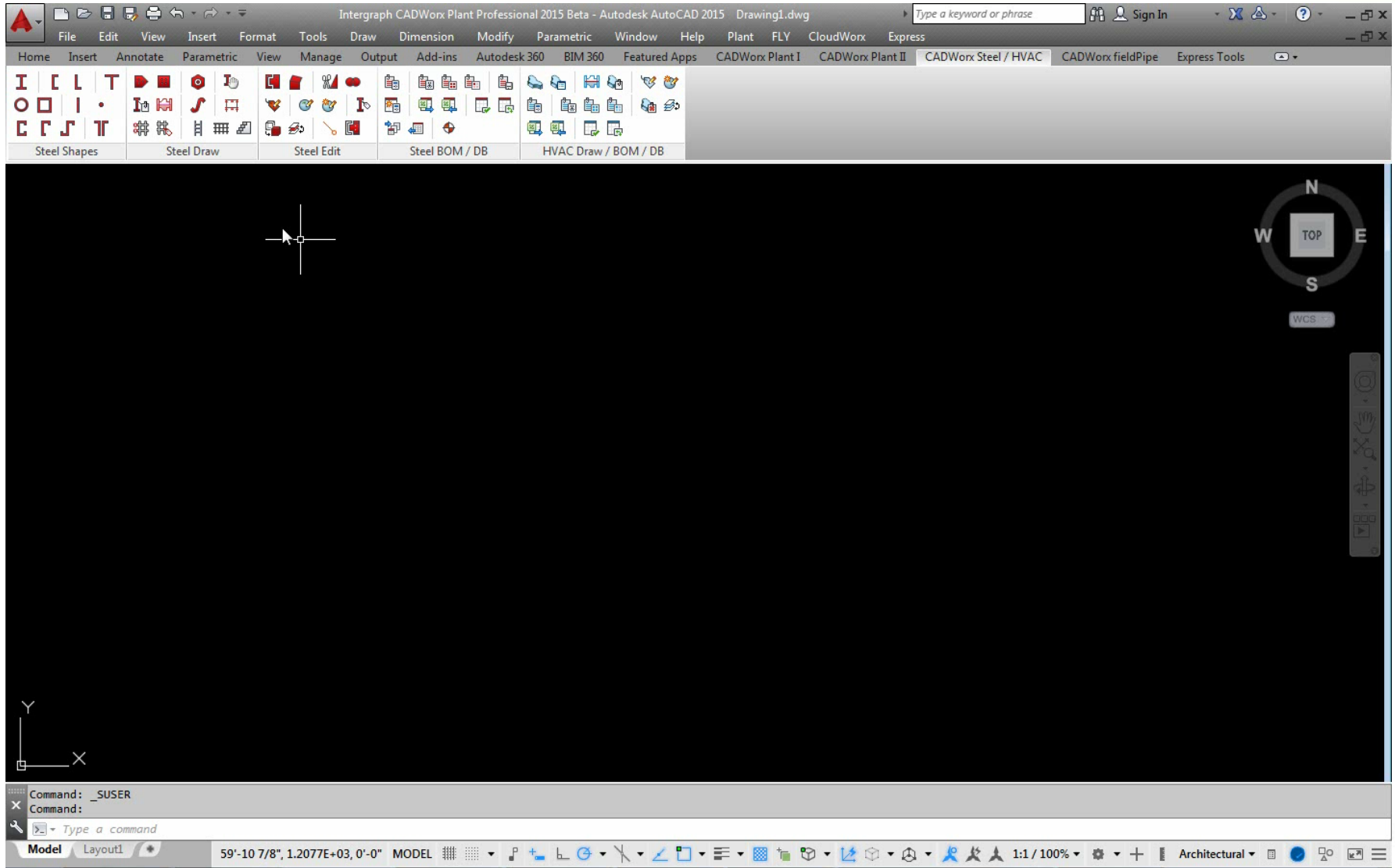
LONG_ANNOTATION=Unistrut Solid Continuous Framing Channel, 12 Gauge

PART_NUMBER=P100010pl-12

WEIGHT=1.0



Steel User Shapes: Example





GET Smart

- Piping User Shapes
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- Piping Generic Attach
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Steel Generic Attach: Overview

- Grating sections can be shown in the model and included in the steel bills of material.
- SGENERIC attaches intelligent CADWorx steel XDATA information to any generic AutoCAD object in the drawing.

Bar Grating, Serrated, 24In. W, 1.5In. H

GAV

Price: **\$240.00** / each



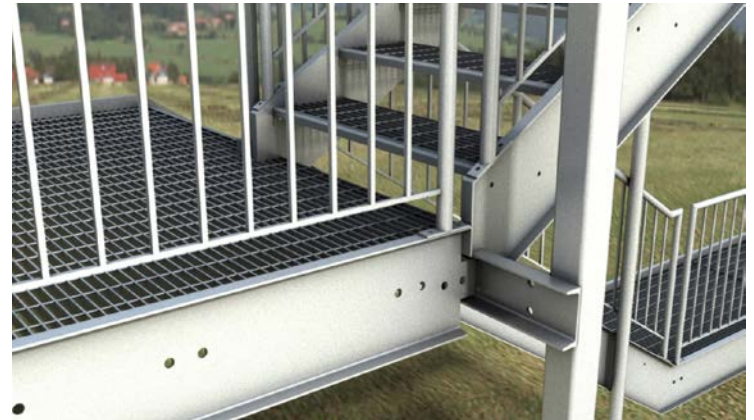
Be the first to write a review | [Ask & Answer](#)

Item # 49N128

Mfr. Model # 22250S150-B4

Catalog Page # N/A

Shipping Weight 154.4 lbs.





Steel Generic Attach: Guidelines

- Steel Generic Attach components are intelligent CADWorx shapes.
- Bills of material, and database reporting can be performed on the Steel Generic Attach shape.
- The Steel Generic Attach shapes do not update.
- Double-click to modify size and details of shape.
- Steel BOM will not work on AutoCAD grouped items. If using ARRAY to speed placement, remember to explode the grouping.
- Steel Generic Attach data can not be removed.
- If WBLOCKS are built with Steel Generic Attach data embedded, the block must be exploded after insertion.

Steel Generic Attach: Dialog



I Generic Attach (Create) X

Long annotation

Description

Short annotation

Part number

Material

Length

Weight

BOM Mark Point

X:

Y:

Z:

CG Location

X:

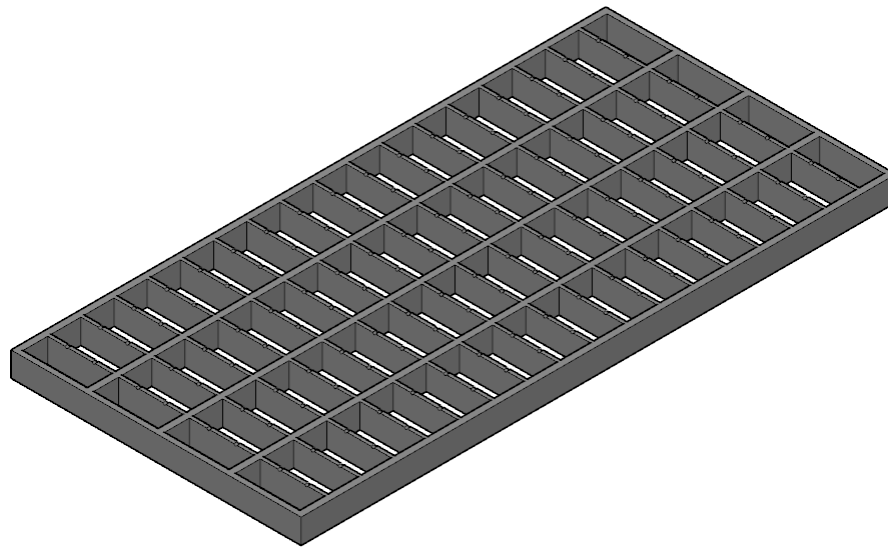
Y:

Z:









Steel Generic Attach: Workflow

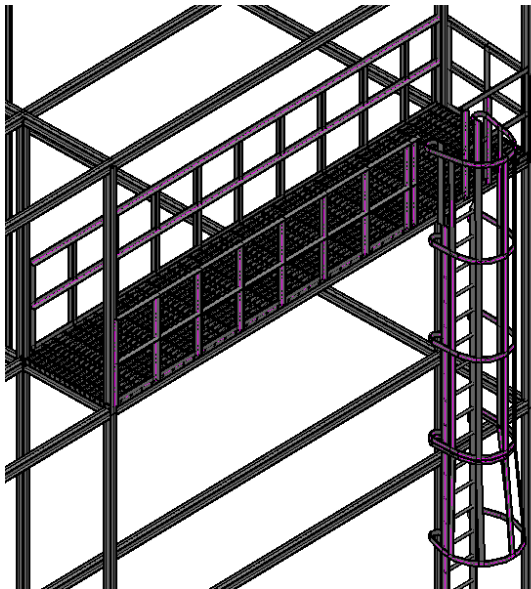
- Create 3D Steel Generic Attach Shape
- Enter Data in the Generic Attach Dialog
- Insert and ARRAY if needed. If ARRAY is used remember to unassociate components.
- Double-click to modify steel generic attach details.
- Generate bills of material



Steel Generic Attach: Example



 Rectangular	 Columns: 1 Between: 1" Total: 1"	 Rows: 10 Between: 2' Total: 18'	 Levels: 1 Between: 2 1/4" Total: 2 1/4"	 Associative Base Point	 Close Array
Type	Columns	Rows	Levels	Properties	Close



Generic Attach (Edit)

Long annotation: Bar Grating, Serrated

Description: 48In. L x 24In. W, x 1.5In. H Cost: \$240.00 / each

Short annotation: Grating

Part number: Mfr. Model # 22250S150-B4

Material: Galv. Carbon Steel

Length: 4'

Weight: 154.000

BOM Mark Point: Specify On-screen

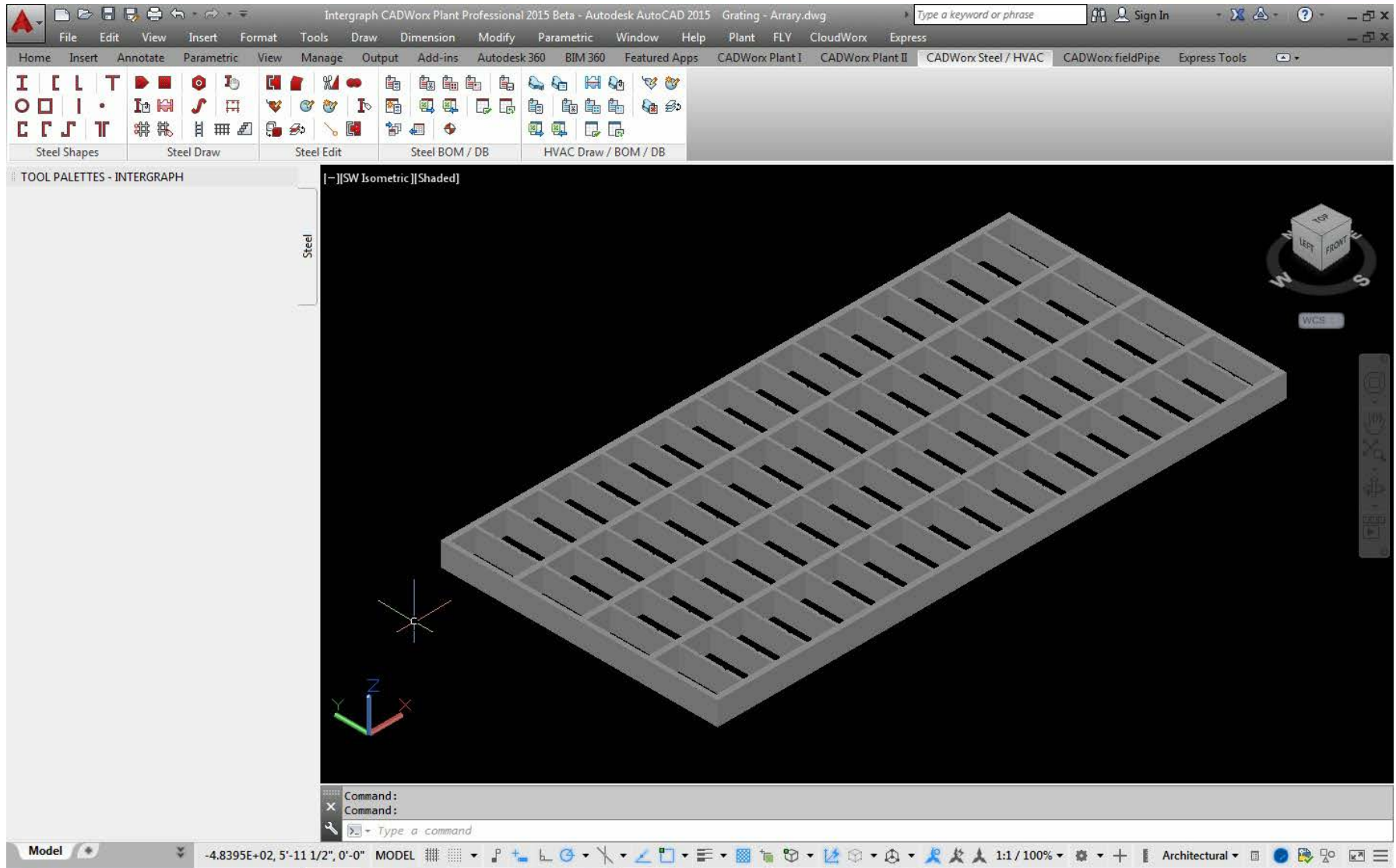
CG Location: Specify On-screen

X:	8'-3 1/16"	X:	8'-3 1/16"
Y:	-6'-4 3/8"	Y:	-6'-4 3/8"
Z:	3/4"	Z:	3/4"

OK Cancel Exit Help



Steel Generic Attach: Example



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HVAC User Shapes: Overview

- Round HVAC ductwork are used in plant design and are important to show in the model and include in the bills of material.
- HUSER uses a user-defined 2D profile to make an intelligent steel custom user shape.





HVAC User Shapes: Guidelines

- The HVAC User Shape is size specific. One component per size is required for each HVAC User Shape.
- The 2D profile must be a joined AutoCAD 2D polyline.
- The origin (0,0,0) is the assumed insertion point for HVAC user shapes.
- The HVAC User Shape description details found in the drawing will be applied to the intelligent HVAC User Shape on insertion.
- HVAC User Shape are extruded to predetermined user length.
- The HVAC User Shapes are intelligent CADWorx shapes. Bills of material can be performed on the HVAC User Shapes.
- The HVAC User Shapes graphics are not maintained through HDBFIN. Only CADWorx HVAC program shapes will be regenerated on import.
- The HVAC User Shape drawing location must be stored in the path *..\<HVACLibraryDirectory>\User Shapes* (based on the CFG file).

HVAC User Shapes: Dialog



The dialog box is titled "HVAC User Shapes" and contains the following sections:

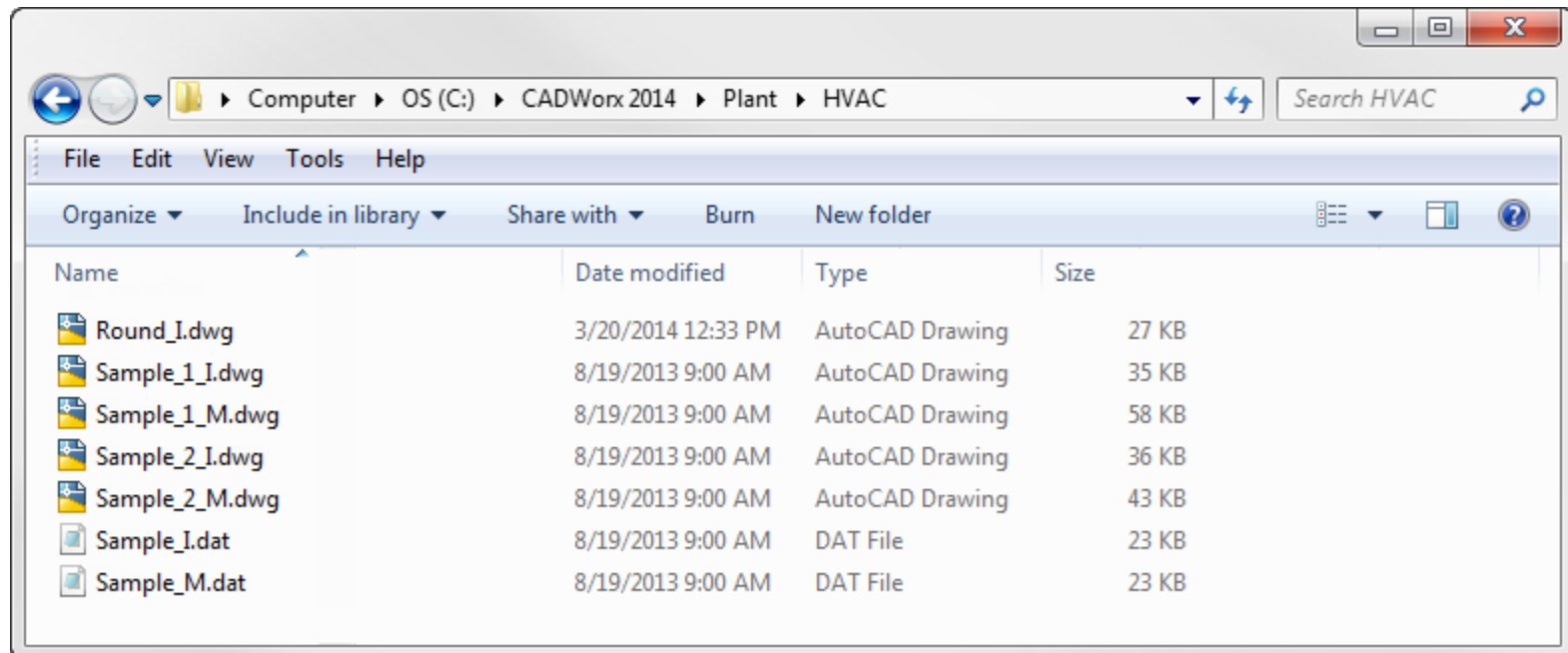
- Select Directory:** A dropdown menu showing "HVAC".
- Select Member:** A list box containing "Sample_1_I", "Sample_1_M", "Sample_2_I", and "Sample_2_M". "Sample_1_I" is selected.
- Details:** A series of text input fields and checkboxes:
 - Short annotation: Sample One
 - Long annotation: Sample One
 - Description: Sample One
 - Part number: PT # 1
 - Material: MAT 1
 - Length: [empty field] Manual Update
 - Weight: 0.000 Manual Update
 - Roll Angle: 0
- Preview:** A small window showing a white line on a black background. The line has a V-shaped dip. To the right of the line is a list of attributes:

```
DESCRIPTION=Sample One
UNIT=INCH
ANNOCT=10
PARTNO=MAT 1
PARTKIT # 0
SHORT_ANNOTATION=Sample One
LONG_ANNOTATION=Sample One
PART_NUMBER # 1
UNIT=L
```
- Buttons:** "Pick points", "Select line", "Help", "OK", "Cancel", and "Exit".



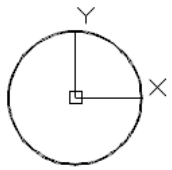
HVAC User Shapes: Workflow

- Create 2D HVAC User Shape
- Add HVAC User Shape drawing to the User Shape directory
- Choose HUSER shape from dialog
- Insert Custom HVAC User Shape in CADWorx

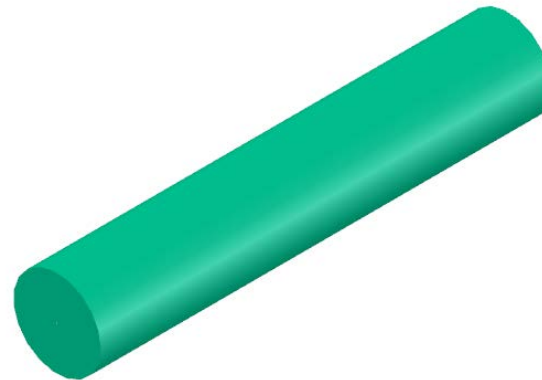




HVAC User Shapes: Example



DESCRIPTION=Circular Galvanized Ventilation Duct
UNITSYSTEM=1
DENSITY=1.0
MATERIAL=MAT 2
PAINT=PNT # 2
SHORT_ANNOTATION=Duct
LONG_ANNOTATION=Round Duct
PART_NUMBER=PT # 2
WEIGHT=1.0





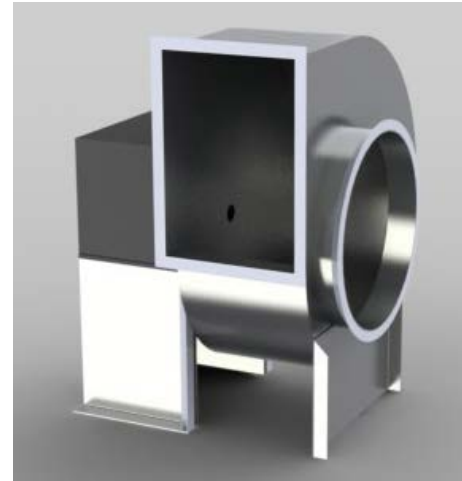
GET Smart

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HVAC Generic Attach: Overview



- Centrifugal Blowers are common in plant design can be shown in the model and included in the HVAC bills of material.
- HGENERIC attaches intelligent CADWorx steel XDATA information to any generic AutoCAD object in the drawing.



HVAC Generic Attach: Guidelines



- HVAC Generic Attach components are intelligent CADWorx shapes.
- Bills of material, and database reporting can be performed on the HVAC Generic Attach shape.
- The HVAC Generic Attach shapes do not update.
- Double-click to modify size and details of shape.
- HVAC BOM will not work on AutoCAD grouped items. If using ARRAY to speed placement, remember to explode the grouping.
- HVAC Generic Attach data can not be removed.
- If WBLOCKS are built with HVAC Generic Attach data embedded, the block must be exploded after insertion.

HVAC Generic Attach: Dialog



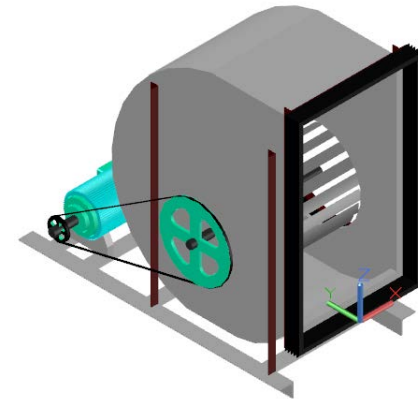
Generic Attach (Create) X

Long annotation	<input type="text"/>				
Tag	<input type="text"/>				
Short annotation	<input type="text"/>	BOM Mark Point		CG Location	
Part number	<input type="text"/>	<input type="button" value="Specify On-screen"/>		<input type="button" value="Specify On-screen"/>	
Material	<input type="text"/>	X:	<input type="text" value="0.0000"/>	X:	<input type="text" value="0.0000"/>
Length	<input type="text" value="0.0000"/>	Y:	<input type="text" value="0.0000"/>	Y:	<input type="text" value="0.0000"/>
Weight	<input type="text" value="0.000"/>	Z:	<input type="text" value="0.0000"/>	Z:	<input type="text" value="0.0000"/>

HVAC Generic Attach: Workflow

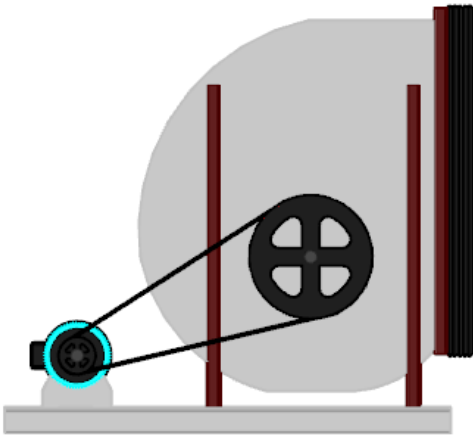


- Create 3D HVAC Generic Attach Shape
- Enter Data in the Generic Attach Dialog
- Insert and ARRAY if needed. If ARRAY is used remember to explode grouped components.
- Double-click to modify HVAC generic attach details.
- Generate bills of material



BILL OF MATERIAL				
MARK	QTY	MEMBER	LONG ANNOTATION	LENGTH
1	1	Generic Attach	Centrifugal Blower	90

HVAC Generic Attach: Example



Generic Attach (Edit)

Long annotation	Centrifugal Blower
Tag	BLWR-1
Short annotation	
Part number	1234
Material	Carbon Steel
Length	7'-6"
Weight	450.000

BOM Mark Point		CG Location	
	Specify On-screen		Specify On-screen
X:	-17'-6 3/8"	X:	-17'-6 3/8"
Y:	2'-8 5/8"	Y:	2'-8 5/8"
Z:	-1'-3 5/16"	Z:	-1'-3 5/16"

OK Cancel Exit Help





GET Smart

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- Topworks User Shapes
- Piping Generic Attach
- Support User Shapes
- Nozzle Generic Attach
- Steel User Shapes
- Steel Generic Attach
- HVAC User Shapes
- HVAC Generic Attach
- **Questions**

Thank You

