



AUTODESK UNIVERSITY 2015

GEN10957-L

A Stitch in Time Saves 9—Build Your Own Content in AutoCAD Mechanical

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Learning Objectives

- Understand the Content Manager, Content Library Interface
- Learn how to create custom content using Content Manager.
- Learn how to share custom content within the company
- Learn how to modify standard content

Description

The Content Manager and Content Browser are key features in AutoCAD Mechanical. Users can pick from more than half a million Standard parts and features from 18 different standards. Users can if ever a user needs new content or a variation of an existing standard part, for example, a new pipe fitting or a steel shape with a hole in a specific place, AutoCAD Mechanical provides the ability to build your own content and store it in custom content libraries, which you can share across different teams and co-workers. This class aims to show you how to use the Content Manager in AutoCAD Mechanical and how to build custom content.

Your AU Experts

Sridhar Subramani has more than 15 years of CAD experience, working as test lead and scrum master at Autodesk, Inc. A seasoned professional in software testing, he has also been actively involved in news groups of AutoCAD Mechanical software and AutoCAD Architecture software and resolved over 1200 issues reported by customers. Sridhar conducts in-house training in AutoCAD software and AutoCAD Mechanical software. He has written several technical solutions that are published on the Autodesk support website.

Gaurav Sachdeva is product manager for AutoCAD Architecture software, AutoCAD MEP software, and AutoCAD Mechanical software. An MPhil in computer science from University of Cambridge and an MBA from Indian School of Business (Hyderabad), Gaurav has regularly spoken at entrepreneurial summits. An artist and a musician on the right side of his brain, he is keenly interested in design and has driven the next-generation strategy and execution of an array of successful products.

Understand the Content Manager Interface:

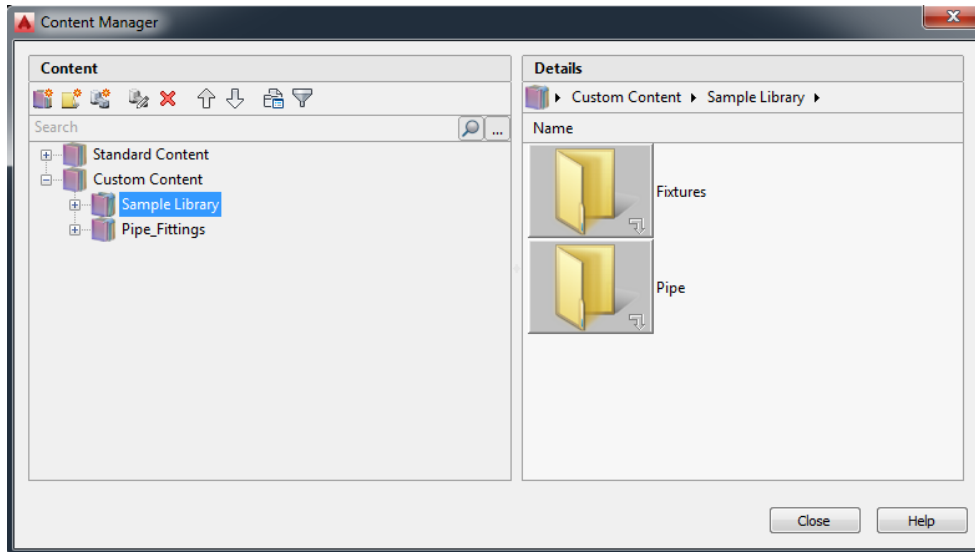


Figure 1

Create Custom Content Using the Content Manager:

Opening the Content Manager

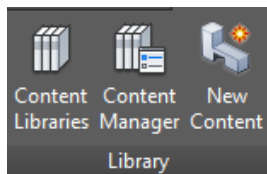


Figure 2

Step-1: Start a New drawing based on AM_ANSI template.

The Content Manager is available on the Content Tab>Library Panel. It is also available as a command by typing **AMCONTENTMANAGER**.

(Content Manager is like Windows explorer where you organize your content based on Standard or component groups and sub groups.)

Creating a Library and Folder in Content Manager

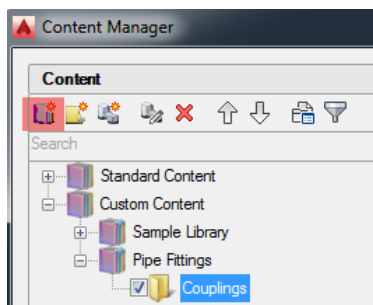
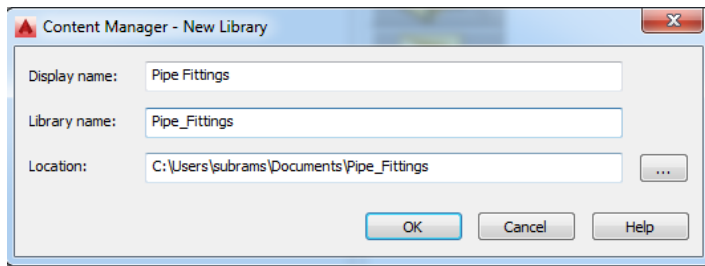


Figure 3

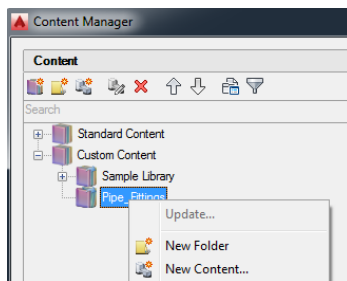
Step-2: In the Content Manager >Click the **New Library** icon.



Specify a name for the Library. E.g. **Pipe_Fittings**.

(A library is place where user can create and organize different component groups. E.g. Pipe Fittings, Conduits, Ducts, etc.)

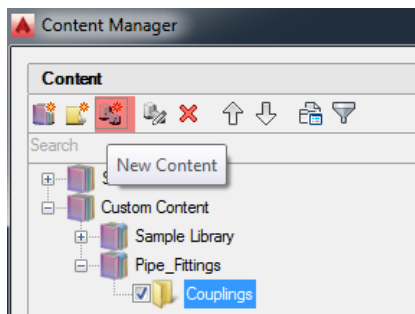
Figure 4



Step-3: Right mouse click on the “**Pipe_Fittings**” Library and create a “**New Folder**”. Specify a name for the folder. E.g. **Couplings**
(A folder is a place where user can organize different content types. E.g. Couplings, Elbows, Flanges etc)

Figure 5

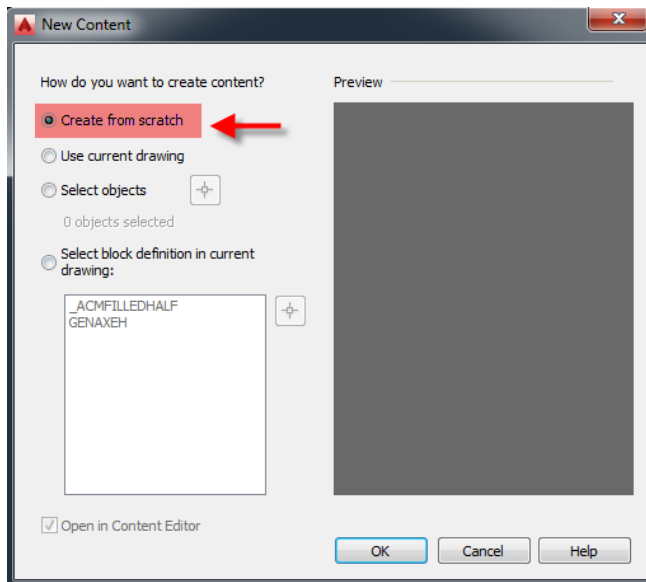
Creating New content from the Content Manager



Step 4: In the Content Manager, select ‘**Couplings**’ and click the ‘**New Content**’ icon

Figure 6





Step 5: In the New Content Dialog box, select 'Create from Scratch' and click OK

(Create from scratch: Starts the Content Editor with no geometries created.

Use current drawing: Creates a new view with the geometries in model space.

Select objects: Creates a new view with the geometries you select.

If you select the Open in Content Editor option, the geometries load into the Content Editor.)

Figure 7

Draw Geometry for the Content

Step 6: Let's create the geometry shown below, using 0,0 as the origin.

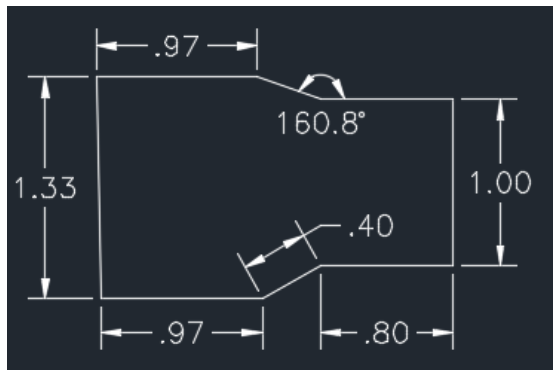


Figure 8

Command: LINE

Specify first point: 0,0

Specify next point or [Undo]: @0.97<0

Specify next point or [Undo]: @0.4<29.2

Specify next point or [Close/Undo]: @0.8<0



Specify next point or [Close/Undo]: @1<90

Specify next point or [Close/Undo]: @0.8<180

Specify next point or [Close/Undo]: @0.4<160.8

Specify next point or [Close/Undo]: @0.97<180

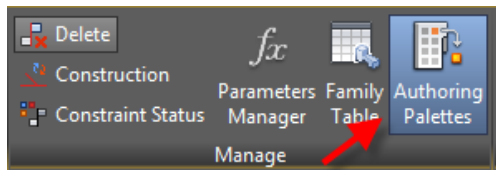
Specify next point or [Close/Undo]: close

OR

Copy and paste the following script at the command line.

(Command "_line" "0,0" "@0.97<0" "@0.4<29.2" "@0.8<0" "@1<90" "@0.8<180" "@0.4<160.8" "@0.97<180" "_c")

Creating Constraints on the Geometry

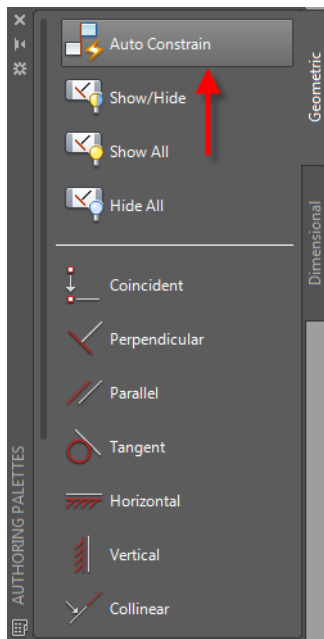


Step 7: Select 'Authoring Palettes' from Content Editor>Manage Panel, if it's not visible in the drawing area.

(Using Authoring palette, we can assign geometric and dimensional constraints for the geometry)

Figure 9

Creating Geometric Constraints on the Geometry



Step 8: In the Authoring Palettes, select the 'Geometry' Tab.

Step 9: Select the 'Auto Constrain' option and select the whole geometry in the drawing area.

Step 10: Select 'Vertical' constraint and pick the vertical line (P2) as shown below.

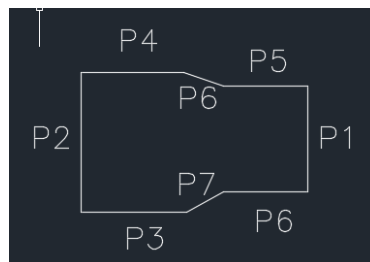


Figure 11

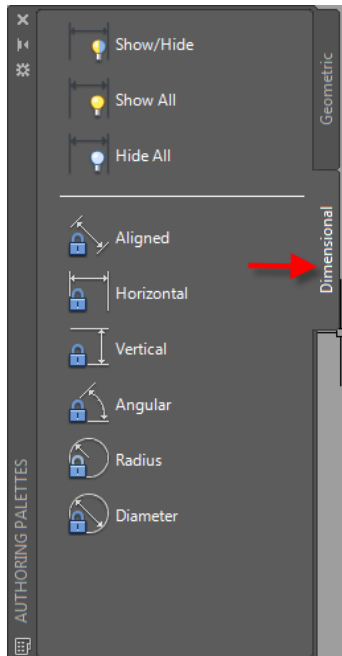
Figure 10

('Auto Constrain' command will automatically apply all possible constraints on the selected geometry. Additional constraints can be applied manually. User can also



delete any of the constraints applied using Auto constrain option. 'Auto Constrain' command will enhance user productivity.)

Creating Dimension Constraints on the Geometry



Step 10: Select **dimensional** Tab

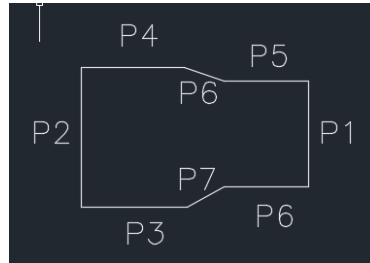


Figure 13

Step 11: Pick '**Vertical**' Dimensional constraint>Press **Enter** Key for **object selection** and select the vertical line (P1) as shown in **figure-13** and place the dimension anywhere on the screen.

Step 12: Repeat **Step 11** and select vertical line (P2)

Step 13: Pick Horizontal Dimensional constraint>Press **Enter** Key for object selection and select the horizontal line (P3) as shown in **figure-13**

Figure 12

Step 14: Repeat **Step 13** and select remaining 3 horizontal lines (P4, P5 and P6)

Step 15: Pick '**Angular**' Dimensional constraint>Select Horizontal line (P5) and inclined line (P6) and enter the angle as 160.8 degrees.

Step 16: Repeat **Step 15** and select Horizontal line (P3) and inclined line (P7) and enter the angle as 160.8 degrees.

Once all the Geometric and Dimensional constraints are applied, the final output will be displayed as shown below.



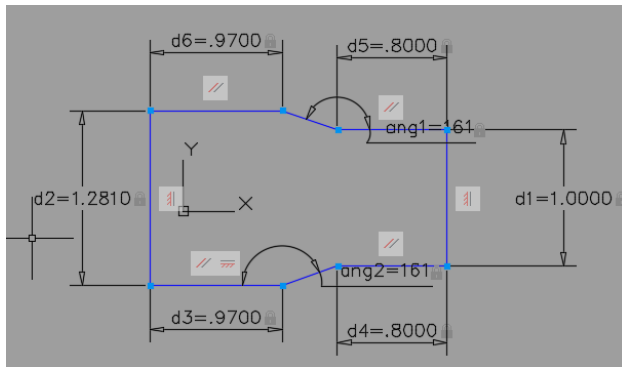
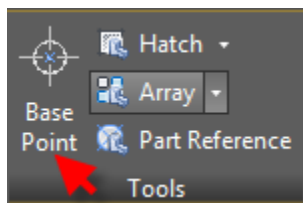


Figure 14

Defining Basepoint and Part Reference

Notice that the geometry is not at the origin (0,0) that we created. When we start assigning the geometric and dimensional constraints the geometry moves from its original location. Furthermore, our content doesn't have an insertion base point.



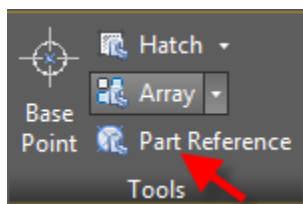
Step 17: Select 'BasePoint' icon from Content Editor> Tools panel and enter 0,0 as select point.

Let's apply a coincident constraint on the base point and the MID point of left vertical line (P2).

Figure 15

Step 18: From the 'Authoring Palettes' select the 'Geometric' tab and select 'Coincident' constraint>Select 'Basepoint' inserted in Step 17 and MID point of left vertical line (P2)

Insert a Part Reference on the content and constraint the Part Reference. By default balloon leaders point to the location of the part reference icon. Let's constrain the Part Reference to MID point of vertical line (P1).



Step 19: Click the 'Part Reference' icon from Content Editor> Tools panel and pick a point close to vertical line (P1).

Step 20: From the 'Authoring Palettes' select 'Geometric' tab and select 'Coincident' constraint>Select 'Part Reference' inserted in Step 19 and MID point of left vertical line (P1)

Figure 16

Defining Parameters and Equations on the Dimensional Constraints of the Geometry

Let's derive all the dimensions created in **Step 11** through **Step 16** based on Parameter **d1**. Equations are created for Parameters **d2**, **d3**, **d4**, **d5** and **d6** based on **d1**.

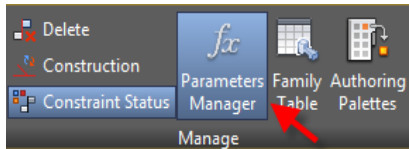


Figure 17

Step 21: Click 'Parameters Manager' from the **Manage** Panel

Parameters Manager Palette includes all dimensional constraint parameters, reference parameters, and user variables in the current drawing

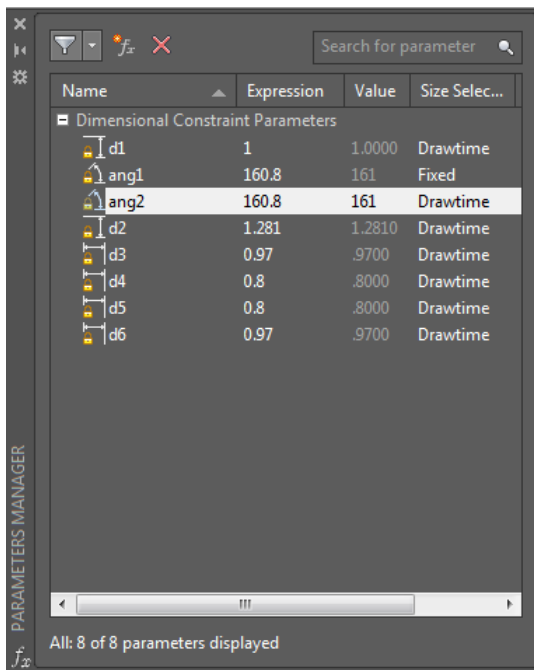


Figure 18

Since the name **d1** doesn't convey any meaning to one who would like to modify the content in the future, let's rename the parameter **d1** to **Coupling_Diameter**

Step 28: Double click the **d1** parameter under 'Dimensional Constraint' column and enter **Coupling_Diameter**.

The final Parameters in the 'Parameter Manager' is shown below. Also notice the change in the parameter names and equations in the drawing area.

Step 22: Double click the **d2** parameter '**1.281**' under parameter column and enter **d1*1.281**

Step 23: Double click the **d3** parameter '**0.97**' and enter **d1*0.97**

Step 24: Double click the **d4** parameter '**0.80** under parameter column' and enter **d1*0.80**

Step 25: Double click the **d5** parameter '**0.8**' under parameter column and enter **d4**

Step 26: Double click the **d6** parameter '**0.97**' under parameter column and enter **d3**

Step 27: Double click the **ang2** parameter '**160.8**' under parameter column and enter **ang1**

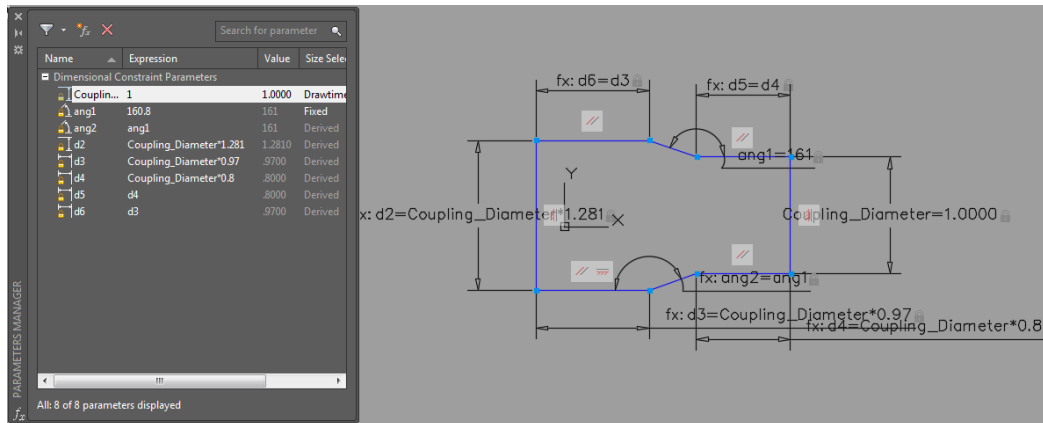
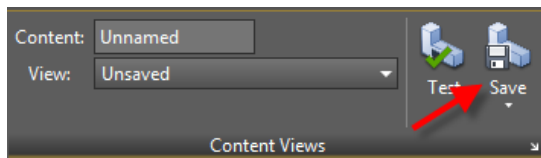


Figure 19

Save the Component as a Content View

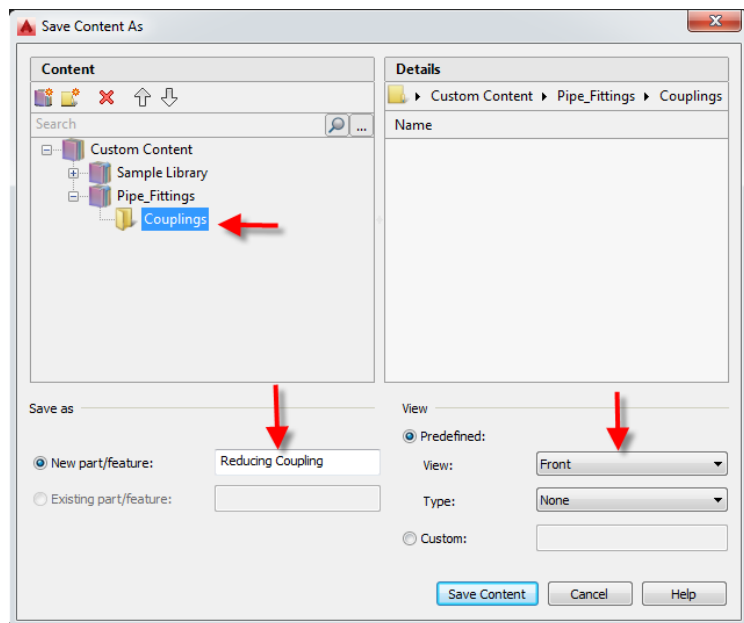
It's time to save the component as a content view. Saving a component can be done at any stage of the content creation. User can save the content at every step or at the beginning of content creation or at the end of content creation.



Step 29: Select 'Save' icon from 'Content Views' Panel in the Content Editor.

Figure 20

This brings up content save dialog box where user can save the content under the specific Library and Folder. User can enter a name for the content and choose a standard content view and content view type. E.g. Front view, Top View, Top Section view, Etc.

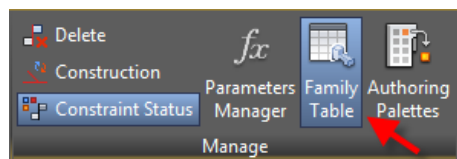


Step 30: Select '**Couplings**' folder under **Pipe_Fittings** Library>Enter a name for the part as '**Reducing Coupling**' and pick a view from **view** dropdown as '**Front**' and click '**Save Content**'.

(User is free to name the part/component with any company standard name and also enter a custom view name. The name entered for the part is the one seen in the Bill of Materials dialog box. The view name will be seen in the Content Manager and Content Library dialog box.)

Figure 21

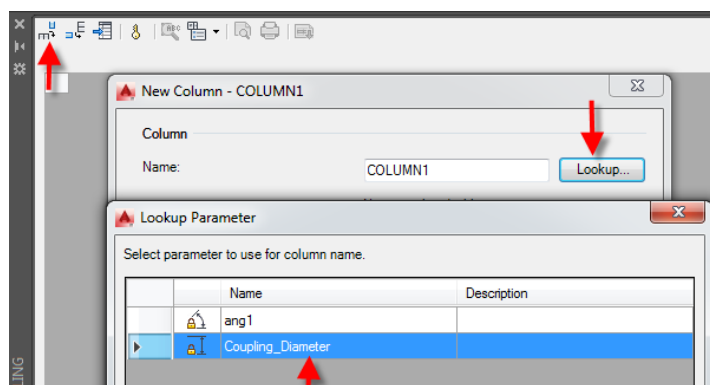
Defining Standard Sizes for the Content in the 'Family Table'



Step 31: Click '**Family Table**' from the '**Manage**' panel in the content editor.

(The Family Table is a database that contains valid values for parameters that define each member of the family. Each row

describes a unique member of the part/feature family. One of the main uses of the Family Table is to define the valid sizes for the part/feature you are editing.)



Step 32: Click the '**Add Column**' icon from the '**Family Table**' Palette. (This is the leftmost button in the Family Table Palette).

Step 33: Click '**Lookup**' from the New Column Dialog box.

Step 34: Select '**Coupling_Diameter**' parameter from the '**Lookup Parameter**' Dialog box and click **OK**.

Figure 23

Let's add a "Global" column for 'Material' and a "Calculated" column for Standard. These parameters represent the Material and Standard2 in the Bill of Materials dialog box.



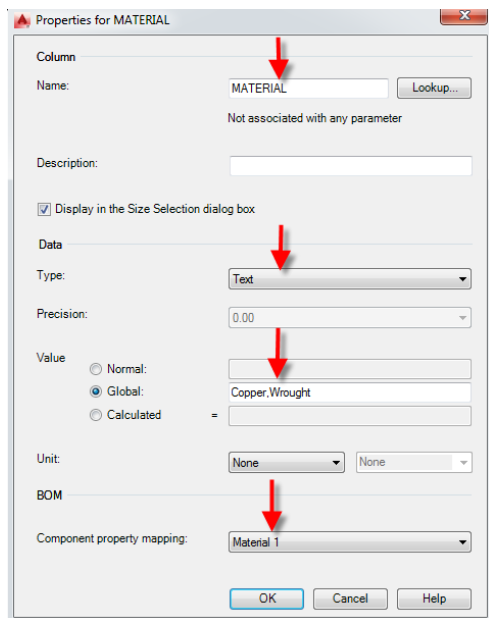


Figure 24

Step 35: Click the 'Add Column' icon from the 'Family Table' Palette.

Click **'Lookup'** from the New Column Dialog box
Key in **Material** for column name>Data Type as **'Text'** >Select **'Global'** radio button for **Value**>Key in "Copper, Wrought" as the value>Select **'Material1'** from **'Component property mapping'**
Click **OK**

Step 36: Click the 'Add Column' icon from the 'Family Table' Palette.

Click **'Lookup'** from the New Column Dialog box.
Key in **Standard** for column name>Data Type as **'Text'** >Select **'Calculated'** radio button for **Value**>Key in "ASME 2467 Coupling - Schedule 80"&" X "&COUPLING_DIAMETER as the value>Select **'Standard/Supplier2'** from **'Component property mapping'**.
Click **OK**.

What we now have is 1 size for the component. Let's add few more sizes for the component by adding 'Rows' in the 'Family Table' Palette. Each Row represent unique size for the component.

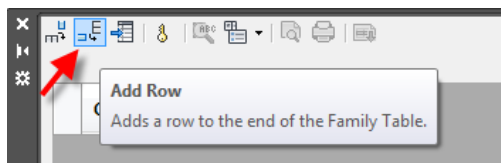


Figure 25

Step 37: Click the 'Add Row' icon from the 'Family Table' Palette. This will add a row. Similarly, add 5 more rows.

In total we will have **6 rows** of same value for **Coupling_Diameter**.

	COUPLING_DIAMETER	MATERIAL	STANDARD
1	0.25	Copper, Wrought	ASME 2467 Coupling - Schedule 80 X 0.25
2	0.38	Copper, Wrought	ASME 2467 Coupling - Schedule 80 X 0.375
3	0.50	Copper, Wrought	ASME 2467 Coupling - Schedule 80 X 0.5
4	0.75	Copper, Wrought	ASME 2467 Coupling - Schedule 80 X 0.75
5	1.00	Copper, Wrought	ASME 2467 Coupling - Schedule 80 X 1
6	2.00	Copper, Wrought	ASME 2467 Coupling - Schedule 80 X 2

Figure 26

Step 38: Double click the value in **Row-1** and modify the value from **1** to **0.25**

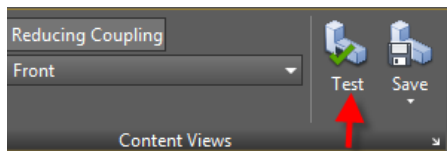
Repeat the step and add **values** as shown in **Figure 26**

Step 39: Click the **'Save'** icon from **'Content Views'** Palette in the Content Editor.

Testing the Content

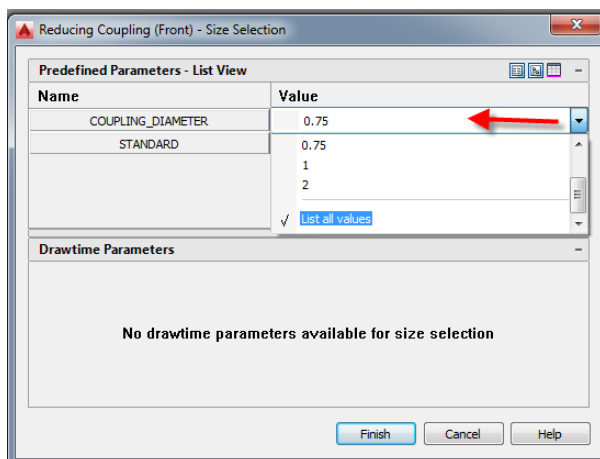
User can test the view of the component or feature being authored, in its current state at any time in the process of content creation.





Step 40: Click the 'Test' icon from 'Content Views' Panel in the Content Editor.

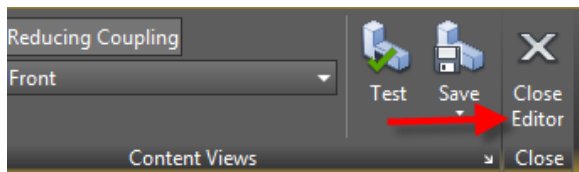
Figure 27



Step 41: Select any value (0.75) from 'Coupling_Diameter' dropdown and click 'Finish'

Step 42: Click 'Close Test Content' from the Content Editor.

Figure 28



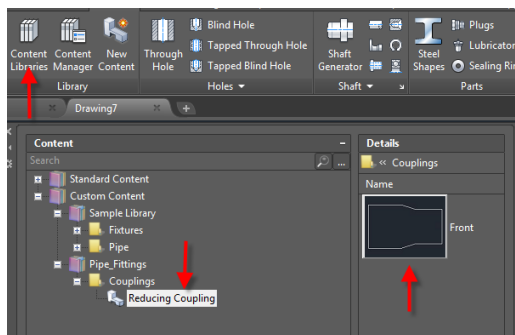
Step 43: Click the 'Save' icon to save the content and click 'Close Editor' to close the Content Editor.

Figure 29

Insert the Content View and Generate Bill of Materials.

Let's insert a new content view in an ANSI drawing template.

Step-44: Click 'New' icon from the QAT>Select an AM_ANSI template from 'Select Template' dialog box.



Step 45: Click 'Content Browser' from Content Tab>Library Panel or use command **AMCONTENTBROWSER**

Step 46: Select the component 'Reducing Coupling' from Pipe_fittings Library and Couplings Folder>Click on Front view.

Figure 30



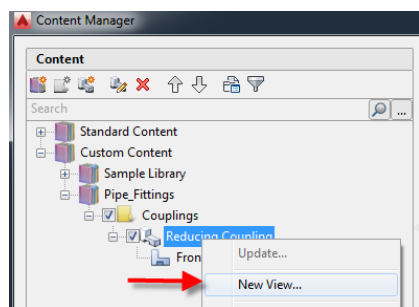
Step 47: Pick an insertion point in the drawing>Press Enter key to accept rotation angle as 0 degrees and select a size from Size selection dialog box.

Step 48: Command AMBOM>user can view the newly inserted component, its name and material that was defined in the 'Family Table'.

Creating a New view (Right Side View) for the Component

New View Creation

Let's create a new view based on Front view. We will re-use the main parameter **Coupling_Diameter** to maintain a link between the views and reuse all the sizes and parameters.

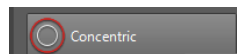


Step 1: Click **Content Manager** from **Content** Tab and **Library** Panel. Or use the command **AMCONTENTMANAGER**

Step 2: Select '**Reducing_Coupling**' from **Couplings** Folder **Pipe_Fittings** Library

Step 3: Right-click '**Reducing_Coupling**' and select '**New View**'.

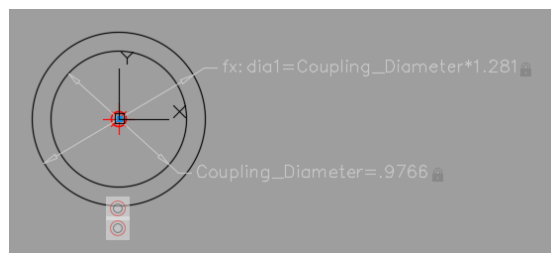
Figure 31



Step 4: Draw 2 **concentric** circles of any diameter

Figure 32

Step 5: Command AutoConstrain and select both Circles or apply a **Concentric** Constrain from '**Geometry**' Tab> '**Authoring**' Palette



Step 6: Insert a **Part Reference** from **Tools** panel and pick the center of a circle. Apply a **Coincident** Constrain by selecting the **Part Reference** and any one of the circles.

Step 7: Insert a **Base Point** at origin (0,0)

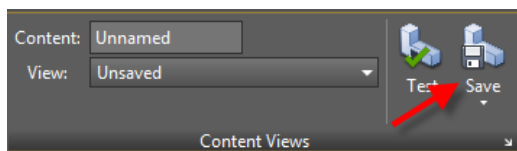
Figure 33

Step 8: Select **Coincident** Constrain from **Geometry** Tab>**Authoring** Palette>Select the **base point** and any one of the circles.

Step 9: Create **dimensional** constraints as shown in **Figure 33** using '**Diameter**' Constrain from **Dimension** Tab in the **Authoring** Palette.

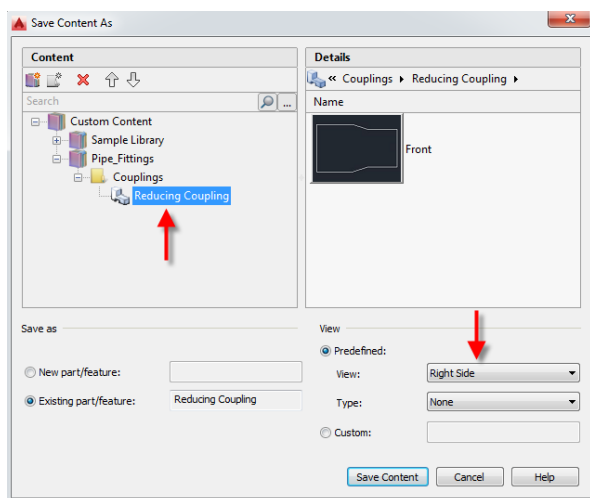


We should ensure that the inner circle diameter parameter is renamed to **Coupling_diamater** either by editing the constraint or from the 'Parameters Manager' Palette or by double clicking the constraint and renaming it.



Step 10: Click the 'Save' Icon and select the 'Reducing Coupling' content under 'Couplings' folder in the Pipe_Fittings Library

Figure 34



Pick a view from **view** dropdown as 'Right Side' and click 'Save Content'.

Figure 35

Insert Side View and Parts List

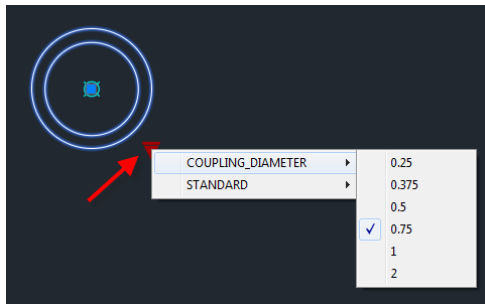
Let's insert the content views, insert a Parts List, Balloon. Update the size of the content to see the how the size changes in drawing area and Parts List.

Step 11: Launch **Content Browser** from **Content** Tab>**Library** Panel OR use command **AMCONTENTLIBRARY**. Insert **Right Side** view of the Reducing Coupling in the drawing area.

Step 12: Click **Parts List** from **Annotate** Tab> **BOM** Panel or use command **AMPARTLIST** to insert a parts list in the drawing area.

Let's change the size of inserted content from **Size Dropdown** of Content.



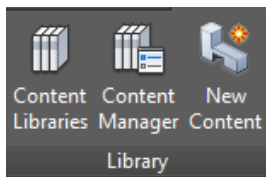


Step 13: Grip select the content view>from the size dropdown>Select '**Coupling_Diameter**'>change the size to 0.75 inch.

Observe how the component size changes and Parts List is updated with the new component size.

Figure 36

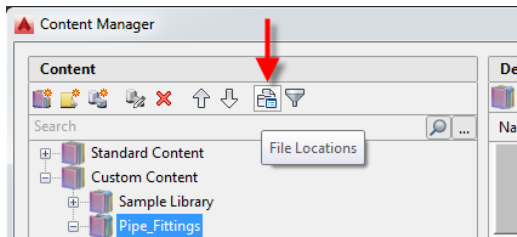
Share Custom Content within the Company



Step-1: Start a New drawing

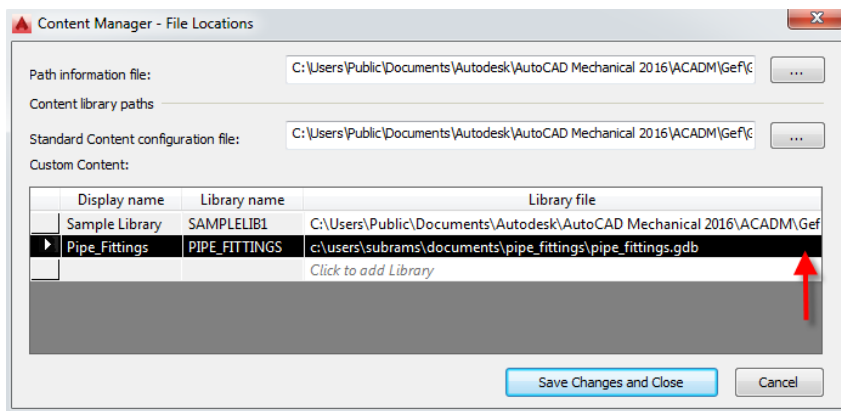
Click "**Content Manager**" from the "**Content**" tab>"**Library**" Panel. It is also available as a command by typing **AMCONTENTMANAGER**.

Figure 37



Step 2: Click the '**File Locations**' button in the **Content Manager** Dialog to launch the 'File Locations dialog box'

Figure 38



Step 3: In the '**File Locations**' dialog box>under the '**Custom Content**' list, locate the library you want to copy and click on the **3 dots** button.

Step 4: In the Library File column, note down the path to the folder containing the .GDB file that is listed in that row. (**Pipe_Fittings**) and copy the folder to the clipboard

Figure 39



Step 5: Launch Windows Explorer and paste the folder (**Pipe_Fittings**) to a shared location that can be accessed by all computers on the network.

Step 6: Go to another computer on the network and launch Content Manager using **AMCONTENTMANAGER** command

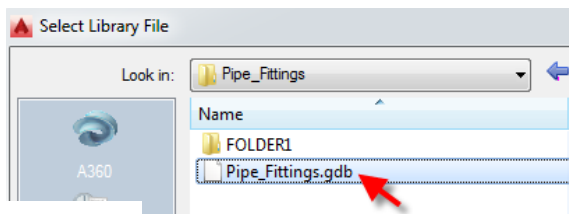


Figure 40

Step 7: Click the **'File Locations'** button in Content Manager>Select **'Click to add Library'** (Figure 39)>Click on the **3 dots** button>Navigate to **'Pipe_Fittings'** folder and select **'Pipe_Fittings.gdb'** gdb file and click Open.

Step 8: Select **'Save Changes and Close'** option from **'File Locations'** dialog box and Select **'Close'** from Content Manager dialog box.

Now users will be able to insert the content from Content Library dialog box.

Modify Standard Content

There is always a requirement to update a standard content that is shipped with AutoCAD Mechanical. In order to modify a standard content, the content should first be copied to Custom content.

In this example, let's copy **ISO 657/1 – 1989 L Shape** to Custom Content.

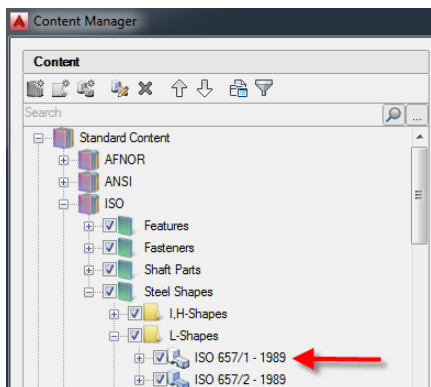


Figure 41

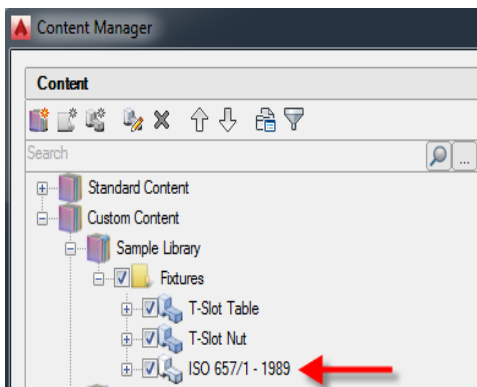


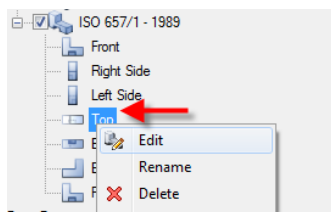
Figure 42

Step 1: Invoke **Content Manager** from **Content** Tab>**Library** Folder or use the command **AMCONTENTMANAGER**

Step 2: Select **ISO 657/1 – 1989 L Shape** from **'Standard Content'**>**ISO Standard**>**L-shapes**>Right Mouse click on the content and Copy.

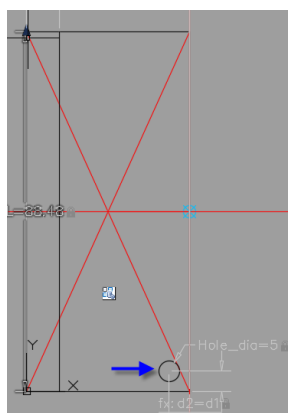
Step 3: Paste the copied content under **Custom Content**>**Sample Library** >**Fixtures** folder (Refer **Figure 42**)





Step 4: Right-click **Top view** of **ISO 657/1 – 1989 L shape content** and select **'Edit'** from the shortcut menu.

Figure 43



Step 5: Draw a **circle** as shown in **figure 44** and constrain the circle with 3 constraints. Use a dimensional constraint with a value of 5 to constrain the circle **Horizontally, Vertically and Diameter constrain**.

Similarly we can create multiple holes on the profile. Also we can use Array within the Content Editor to create an array of holes.

Step 6: Select **'Save'** icon from **'Content Views'** Panel in the Content Editor.

Figure 44

Step 7: Open a new **AM_ISO** template. Launch **Content Browser** from **Content Tab Library** Panel or use command **AMCONTENTLIBRARY**

Step 8: Insert **ISO 657/1 – 1989 – Top view** from Custom Content>**Pick a point** in the drawing area>Press **Enter** for Rotation angle as **0 degree**>Select a **size** from Size Selection dialog box.

Note: User can enter the required **Hole diameter** and distance between the edges for the hole.

List of command used in this exercise:

1. AMCONTENTMANAGER
2. AMCONTENTLIBRARY
3. AMCONTENTADD
4. AUTOCONSTRAIN
5. BAUTHORPALETTE
6. PARAMETERS
7. AMCTABLE
8. AMCPARTREF
9. AMCBASE
10. AMCSAVE
11. AMCTESTCONTENT
12. AMCCLOSE

