Customizing AutoCAD® Plant 3D Isometrics

In this paper, you will learn how to customize the isometrics produced by AutoCAD Plant 3D so that they will meet your CAD and engineering standards as well as the standards of your client. This paper will walk you through the steps necessary to perform this task and give guidance based on practical experience for best practices for piping isometrics.

Learning Objectives

At the end of this paper, you will be able to:

• Understand the Different Customization Options in AutoCAD Plant 3D
• Create and Customize a New Isometric Style
• Add a Custom Title Block
• Modify Isometric Symbols
Isometric DWG Settings

(Ribbon Tab: Home → Project → Project Manager Flyout → Project Setup)

Command: PROJECTSETUP

The command above opens the dialog where current project settings can be viewed and modified. Almost all of this class will be spent in the Isometric DWG Settings section of this dialog, which contains 5 sub-sections of customization.

As with all of the five isometric customization screens, it is important to first make sure that you are set to the iso style that you want to modify. This flyout is located in the top right corner of the dialogs.

An “iso style” is a named container for all of the various settings which determine the content of the isometric drawing. Everything from the title block to the dimensioning and annotation styles are contained within the iso style.

For each isometric style that you create in a project there are separate folders which contain the PCF files, the Quick Isos and the Production Isos. The latter of these documents being the ones published to the project.
Customizing AutoCAD® Plant 3D Isometrics

Let’s look at the 7 different customization screens:

**Iso Style Setup**

![Iso Style Setup](image)

The *Iso Style Setup* customization screen contains commands for:

- Iso Style Setup – Create or Set Iso Styles
  - New styles are based upon existing ones
- Iso Style Information – General Settings for the Current Style
  - Isometric or Spool drawing
  - File Naming – Alphabetic or Numeric
  - Maximum Welded Pipe Lengths
  - Field Fit Weld Settings
  - Table Overflow Settings
- Spools – Determines Spool Sizing
  - By Size, By Weight or from Model Settings
- Iso Style Paths – Configures Drawing Output Paths
Advanced Defaults

The Advanced Defaults customization screen contains controls for:

- Creating DWFs
- Overwriting Existing Styles
- Setting the Revision
- Congestion Settings
- Creating a PCF
- Exporting Data Tables
- Controlling Iso splitting
- Ignoring Break Points or Annotations
- Overriding the Model location and Orientation
Customizing AutoCAD® Plant 3D Isometrics

The Annotations customization screen contains controls for:

- BOM Annotations
- Weld Numbering
- Cut Piece Labeling
- Spool Labeling
  (All of the above have controls for numbering, enclosures and leaders)

- Valve Tag Numbers (Both Control and Manual)
- Continuation and End Connection text
  - Can use model properties (ex: <Equipment.Tag>)
- Coordinate and Elevation Prefixes
The Dimensions screen controls:

- Which of the three dimension types are active in the drawing:
  - Overall/End-to-end Dimensions
  - String Dimensions
  - Locating Dimensions

- Individual Component Dimensioning Behavior
- Valve Dimensioning Behavior
- General Dimension Options
  - Over constraining dimension chains
  - Gasket Dimension “ticks”
  - Dimension offset and stacking distances
Customizing AutoCAD® Plant 3D Isometrics

Sloped and Offset Piping

The Sloped and Offset Piping customization screen is dedicated to defining:

- The Breakpoint for Sloped vs. Angled Piping
- Sloped Pipe Annotation
- Offset Piping Hatching and Angle Annotation
- Dimensioning and Annotation for the Three Types of Offsets
  - Simple 2D Offsets (Vertical or Horizontal)
  - Sloped 2D Offsets
  - Rolling 3D Offsets

Tip: Use the dynamic image panes along the right margin to get a preview of the offset style selected.
Customizing AutoCAD® Plant 3D Isometrics

**Title Block and Display**

The title block and display customization screen is for:

- Editing the Title Block via a context-sensitive ribbon menu
- Setting the Drawing Template Location
- Editing Isometric Symbols
- Managing display of
  - Elbows
  - Bends
  - Supports
  - Existing Piping
- Establishing the Breakpoint for Small Bore Piping as it applies to the Iso Themes

On this screen there are two areas worthy of special focus: Setup Title Block and Edit Isometric Symbols. Each of these will launch a special “guided” AutoCAD editing session to perform specific customization tasks. As always, use care and the proper commands when editing these two areas.
Customizing AutoCAD® Plant 3D Isometrics

Setup Title Block

When selecting this command, the ISO.DWT drawing template is opened and a ribbon named Title Block Setup is activated.

This ribbon contains the following panels and commands:

- **Isometric Drawing Area**
  - Draw Area (where the iso will be drawn)
  - No-Draw Area (reserved areas)
  - Area Visibility (Toggle)
- **Table Placement & Setup**
  - Bill of Materials
  - Cut Piece
  - Weld List
  - Spool List
  - Table Setup
- **North Arrow – Place North Arrow** (block name must be North Arrow)
- **Attributes – Title Block Attributes** (opens the block editor modifying Title Block)
- **Themes – Iso Themes**
  - Layers
  - Dimension and Annotation Styles

Edit Isometric Symbols

This command modifies the block symbol library in IsoSymbolStyles.dwg.
The Live Preview screen is for:

- Viewing isometric style output
- Defining a test pcf that demonstrates company customizations
- You should use this to alter your company styles and view the changes without having to recreate isometrics based on a pipe line.
Isometric Customization Sequence

As with any customization, it is a good idea to have a clear objective as far as what the end result is supposed to look like. It is also wise to have a clear “punch list” of steps to complete a customization. Consider the steps below when endeavoring to setup a custom isometric style in AutoCAD Plant 3D.

AutoCAD Plant 3D Isometric Customization Sequence

- Customization Screens
  - Iso Style Setup
  - Annotations
  - Dimensions
  - Sloped and Offset Piping
  - Title Block and Display
    - Template Drawing: ISO.DWT
    - Title Block: Title Block (required name)
    - Customize Symbol Library: IsoSymbolStyles.dwg

- Modify Support Tags
  - <project>\isometric\<style name>\IsoConfig.xml

Note: always use the Project Setup menu Title Block and Display customization screen to modify the ISO.DWT template drawing and the IsoSymbolStyles.dwg

- Modify SKEY Settings
  - <project>\isometric\IsokeyAcadBlockMap.xml

- Modify Bolt Size and Valve Operator Direction Mappings
  - <project>\isometric\BoltSizeMappings.xml

Note: The last two files are style-independent and apply to all iso styles in the project.
Editing xml files

Warning – before you make any changes to xml files, make a backup! It is the xml files that control the look of the iso’s, the UI’s we have shown you above simply perform graphical edits to the XML’s

In this example we will place a support tag on the isometric. There is currently no UI to support this and so you will need to edit the IsoConfig.xml in the appropriate style. You can use Notepad to perform these edits (or Notepad++ if you want a specific xml editor).

Add a new Component scheme entry for SupportTag:

![Image of IsoConfig.xml file in Notepad+]

Take the <ComponentScheme Name="Tag" as a template and copy it – rename the “Tag” to “SupportTag”, set Enabled="true", set Filter="Support” and make other changes to support your style, then save.

Here’s the actual entry:

```xml
<ComponentScheme Name="SupportTag" AnnotationStyle="WipeCircle" Enabled="true" Grouping="true" Tag="XX" Alignment="FlatHorizontal" LeaderStyle="Always" Filter="Support" Fields="TAG" />
```
Customizing AutoCAD® Plant 3D Isometrics

Result - Before:

After: