

Reference: WP-CAD-00140 July 2014 Guide by Andy Davis

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# **Creating System Isometrics in AutoCAD Plant 3D**

# AutoCAD Plant 3D 2014

#### Production Iso vs. Quick Iso

AutoCAD Plant 3D supports two types of Isometric drawing: a Production Iso and a Quick Iso.

Production Iso's are the final fabrication drawings that are issued for production. They are generated by line number and are recorded in the project database.

Quick Iso's may be generated from multiple line numbers or ad-hoc runs of pipe that have been selected manually from the plant model, but they are not intended to be project deliverables and so are not recorded in the project database.

#### System Iso

A System Iso is a drawing of a process system, a collection of related pipe runs that could include multiple line numbers. The standard configuration of AutoCAD Plant 3D does not provide a mechanism for defining a process system or for producing a System Iso.

This White Paper proposes a mechanism by which System Iso's may be defined and generated in AutoCAD Plant 3D. To do this, changes must be made to Project Setup and a new Isometric Style must be defined.

System Iso's will not, however, be recorded in the project database if they are generated as Quick Iso's.

### **Project Setup**

To identify a process or piping system a new property needs to be added to the P3DLineGroup and PipeRunComponent Classes in Project Setup.

In this example, the property IsoSystem is added to P3DLineGroup class as a String property

Plant 3D Class Definitions	Property Name	Description	Display Name	Default Value	Property Type	Acquisition	Read Unly	View	View		(
<ul> <li>→ Porg and Equipment</li> <li>→ Porg and Equipment</li> <li>↔ Equipment</li> <li>↔ Fastemens</li> <li>↔ Poe Run Component</li> <li>⊕ Seel Structure</li> <li>⊕ Isometric DWG Settings</li> </ul>	Number		Number		String	None		<b>V</b>	<b>V</b>		Edit
	NominalSpec		Nominal Spec		String	None		<b>V</b>			Remove
	NominalSize		Nominal Size		String	None		<b>V</b>			
	Description		Description		String	None		<b>V</b>	<b>V</b>	1	
	Comment		Comment		String	None		<b>V</b>		1	
	Service		Service		List	None				1	
	Insulation Thic		Insulation Thic		List	None		<b>V</b>			
	Insulation Type		Insulation Type		List	None		<b>V</b>		Ξ	
	TracingType		TracingType		List	None					
	Locked		Locked Line S		String	None		<b>V</b>			
	LockedBy		Lock Change By		String	None		<b>V</b>	<b>V</b>		
	LockedTimest		Lock Change At		String	None		<b>V</b>			
	Iso System		lso System		String	None		<b>V</b>			
	TagEomatNamo			Line Mumber	Teo Count					1	

and also added to PipeRunComponent class as an Acquisition property set to acquire its value from P3DLineGroup.IsoSystem.









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	Property Name	Description	Uisplay Name	Default Value	•	Property Type	Acquisition	Read Unly	View	View		
P3d Line Group	TracingType		Tracing Type	Acquisition	-	List	P3dLineGro			<b>V</b>		Edit
Equipment	Insulation Type		Insulation Type	Acquisition	-	List	P3dLineGro			<b>V</b>		Remove
In Fasteners	Service		Service	Acquisition	-	List	P3dLineGro			<b>V</b>		
Pipe Run Component	TracingSpec		Tracing Spec	Acquisition	-	String	P3dLineGro					
Isometric DWG Settings	Insulation Spec		Insulation Spec	Acquisition	-	String	P3dLineGro			<b>V</b>		
Tag		Tag			String	None			<b>V</b>			
	TielnNumber		Tie In Number			String	None			V		
SpoolNumber Spool Number String	None			V								
	Unit		Unit			String	None			<b>V</b>		
Line NumberTag Line Number	Line Number T	Acquisition	-	String	P3dLineGro			V				
	Shop_Field		Shop/Field	SHOP	-	List	None			<b>V</b>		
	IsoSystem		Iso System	Acquisition	-	String	P3dLineGro			V		
				r	1						=	

The IsoSystem property may now be used to define a process system during the modelling process. To do this, the IsoSystem property of related pipe run components may be set in the Process Line section of the AutoCAD property window.

1	100juciii	oyaccin 1
Pr	ocess Line	▲
	Insulation Thickness	
	Insulation Type	
	InsulationSpec	
	TracingSpec	
	TracingType	
	Locked Line Status	Unlocked
	Lock Change By	
	Lock Change At	
	Iso System	System 1

or alternatively it may be set through the Data Manager Window.

#### **Isometric Style**

The simple Plant 3D piping example below, consists of 5 lines, numbered L1 – L5. They have been grouped into 2 systems, System 1 and System 2, using the IsoSystem property. To generate the 2 System Iso's from this model, a new Isometric Style needs to be created, called System\_Iso in this example.









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The quickest way to create the System\_Iso Isometric Style is simply to copy and rename an existing style. For example, to create the new style from the Check\_A2 style, copy and rename the Check\_A2 folder to System\_Iso inside the Isometric project folder.

Organize 🔻 📸 Open 🛛 Include in library 👻 Share with	<ul> <li>Burn New folder</li> </ul>		: :==	• 🔟 🕐
🌗 Equipment Templates	^ Name	Date modified	Туре	Size
ImportExportSettings		18/06/2013 16:48	File folder	
Sometric Check_A2	Check_A3	17/06/2013 10:37	File folder	
🚺 Check_A3	Final_A2	18/06/2013 11:13 17/06/2013 10:37	File folder File folder	
Final_A2	Live Preview	17/06/2013 10:32	File folder	
Elive Preview	Spool_A3	17/06/2013 10:37	File folder	
🌗 Spool_A3	Svstem Iso	17/06/2013 10:37	File folder	
Stress_A2	BoltSizeMappings.xml	21/01/2011 18:12	XML File	2 KB
Orthos	IsoSkeyAcadBlockMap.xml	04/11/2012 23:20	XML File	10 KB
II DWG	IsoSymbolStyles.dwg	18/06/2013 11:48 23/12/2011 01:00	AutoCAD Drawing	220 KB 51 KB
Plant 3D Models	PropertyTranslationMapping.xml	24/08/2011 05:09	XML File	1 KB

#### Iso.atr File

The new IsoSystem model property must be included in the BOM Attribute List of the new style to make it available to the Isometric software during the generation procedure. To do this, a new entry must be added to the end of the BOM-ATTRIBUTES list that is found in the file iso.atr in the System\_Iso folder. The file is a simple text file and can be edited with any standard text editor. For example:

```
BOM-ATTRIBUTES
EngineeringItems.Schedule
EngineeringItems.PressureClass
EngineeringItems.Material
EngineeringItems.IsoSystem
```

#### Isoconfig.xml File

To use the IsoSystem property to split the Iso, the isometric configuration file that is used to generate the Iso must be modified. The file isoconfig.xml is a simple text file that is found in the System\_Iso folder and can be edited with any standard text editor. The section <Model split...> must be modified to force the Iso to split when the IsoSystem property changes. For example:

- <Model Split="true" ModelSplitMethod="PropertyChange">
- <!-- Properties defines the option to split isos on changes of properties -->
- <!-- Both 'PropertyChange' and 'Filter' can be empty. -->
- <!-- 'PropertyChange': Specifies which property change will trigger the split. -->
- <!-- 'Filter': Specifies the designated item (which can be thought of as multiple properties)

where the split should take place. For example, Filter="Type='Gasket' AND Category='ERECTION-ITEM'". -->

</Model>









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#### **Isometric Generation**

When a System Iso is generated from a signal line number, the Iso may be generated as either a Quick Iso or a Production Iso. However, when the System Iso inludes multiple line numbers, it can only be generated as a Quick Iso.

Once the lines have been selected, in the Advanced options window, the option "Split Iso when property changes" and all options below it must be cleared.

Export settings Create PCF on Iso creation	Drawing congestion splitting Level of congestion to split Iso at:
Export tables on Iso creation:	Less More
BOM Weld	
Cut Piece Spool	Force Iso onto one sheet
Export format: Excel (xlsx)	Split Iso when property changes:
Advanced settings & overrides	Line number
🗆 Janese Presk Prints from model	Service Spec
Ignore break Forns from moder	Nominal diameter
Ignore Iso annotations from model	L Material
Reverse Iso start and end points	Override location
Override default North Arrow direction	Offset location: X: 0 Y: 0
🖳 Upper Left	<ul> <li>Offset rotation: 0 DEG.</li> </ul>









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## Example

In the example, the Quick Iso command has been used and the entire model selected using a right to left crossing window.





The resulting Iso's are shown below:



lso 1

lso 2



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