

THE SHAPE OF *POTENTIAL*



HxGN | LOCAL



EDISON, NJ
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HEXAGON

90 CADWorx Tips in 90 Minutes

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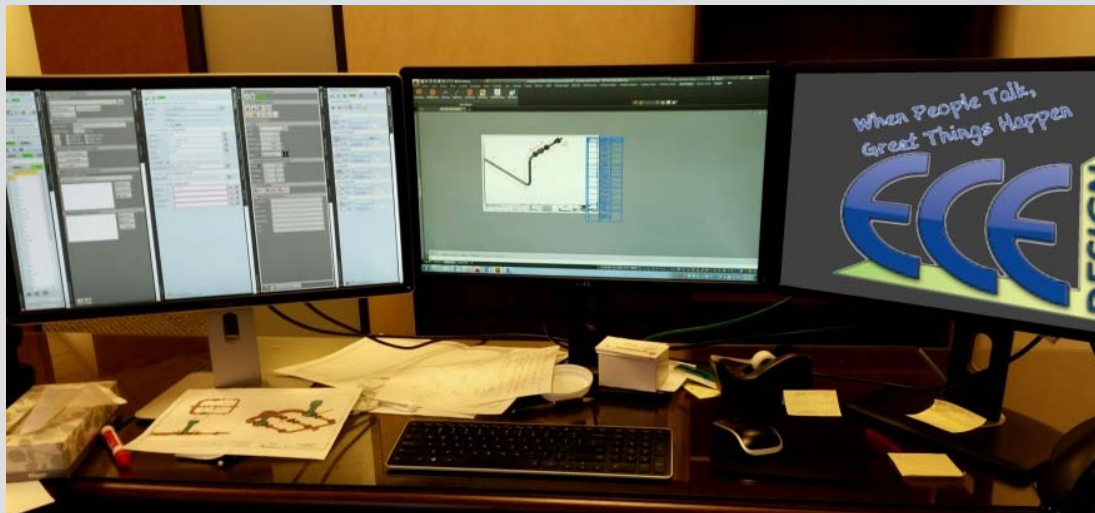


Objectives:

Share 90 of my favorite tips and techniques that have increased my productivity and efficiencies during my years of design using CADWorx

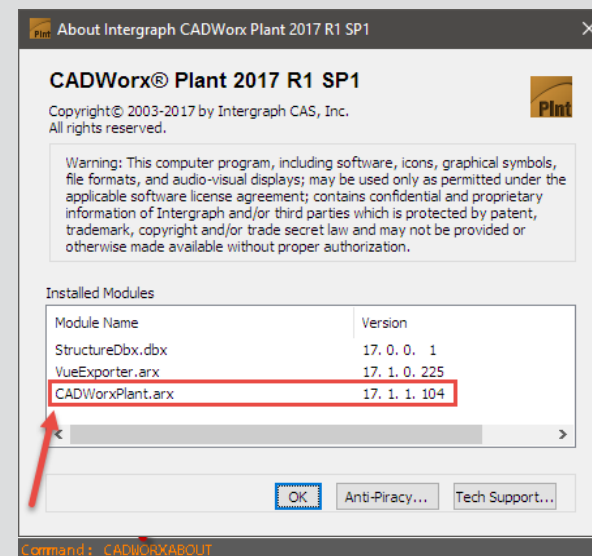
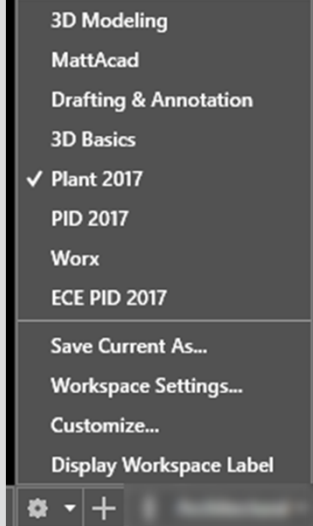
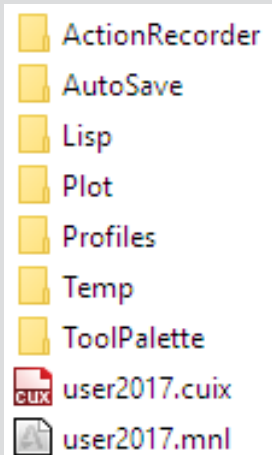
Hardware

- 1) SSD Hard drives
- 2) Max your RAM to your budget/computer
- 3) Dual MONITORS or more
- 4) Autodesk Certified Graphics Card & computer manufactures latest driver
 - www.autodesk.com/graphics-hardware



Project Setup – Computer Tips

- 5) Create your own workspace
- 6) Create and use a custom CUIX file
- 7) Export your CADWorx Profiles regularly
- 8) Run the latest version when starting a new project



Project Setup – Project Centric Files

- 9) Setup your piping rules
- 10) Project Standard Config files
- 11) Project Standard Client Approved Specification files
- 12) Create Assemblies
- 13) Project Standard Equipment Data files
- 14) Project Standard Insulation Files
- 15) Create ISOGEN styles for different needs

Piping Rules		☐ Include in CFG
Apply Size Rule	Automatic	☒
Apply Specification Rule	Automatic	☒
Apply End Type Rule	Automatic	☐
Apply Pipe Length Rule	No	☒
Apply Weld Insertion Rule	Automatic - Buttweld Only	☐
Apply Gasket Insertion Rule	Automatic	☐
Apply Bolt Insertion Rule	Automatic	☐
Apply Trimmed Elbow Rule	No	☒
Apply Pipe Healing Rule	Automatic	☒
Apply Branch Table Rule	Automatic	☐
Apply Flange Insertion Rule	Automatic - Use Spec Setting	☐
Apply Bolt Hole Orientation Rule	Automatic - 2 Holes	☒
Apply Pipe End Prep Rule	Automatic	☐
Apply Auto Coupling Rule	No	☒
Apply Line Number Rule	Always Inherit	☒
Apply Change Data Rule	Tag, ...	☒
Apply O-Let Minimum Spacing Rule	3	☒
Center Line	On	☒
Apply Skew Pipe Maximum Angle	15.0000	☒
Variable Component Length Assign	Show Options	☒
Incompatible Component Actions	Update Compatible Components	☐

Project Setup – File Tips

16) Always start with a CADWorx template - Don't copy old files

17) Design near 0,0,0

CADWorx Error Number 2012

CADWorx coordinate limits are as follows:

In imperial coordinates (English / Inch Mode), the limit is approximately:

-9000000 inches to 99000000 inches

-750000 feet to 8250000 feet

-140 miles to 1500 miles

In metric coordinates (Metric / Metric Mode), the limit is approximately:

-9000000 millimeters to 99000000 millimeters

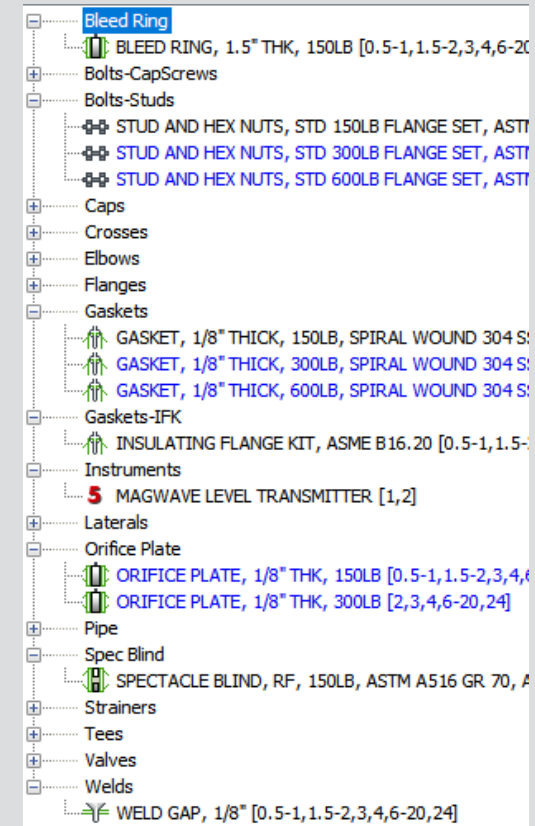
-9000 meters to 99000 meters

-9 kilometers to 99 kilometers

18) Use AutoCAD north as plant/world north

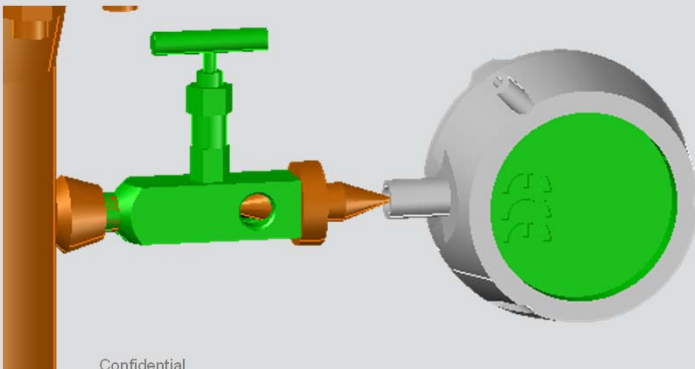
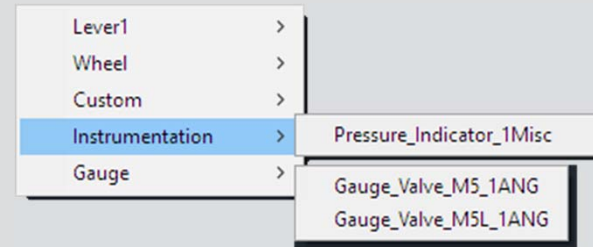
Specifications – Catalog Tips

- 19) Don't modify OOTB files - Create copies of modified files (CATS, PRJs, Blocks, Templates...)
- 20) Create missing components with OOTB component types
Orifice Plates
- 21) Organize your components into Groups
- 22) Create usershapes for everything else - Detailed Filters
- 23) Set default Flanges Bolts and Gaskets in your catalog



Specifications – Catalog Tips

- 24) Use Topworks
- 25) Use Custom Topworks Groups
- 26) Use Enhanced View Clamps - COMPONENTDWGBLOCKEDIT
- 27) Use optimized vendor drawings when possible - Topworks, Usershapes and Equipment



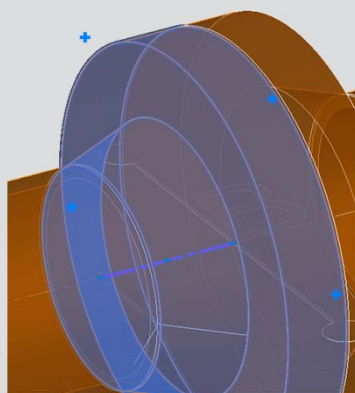
Confidential

CPL_SW_3000*									
MAINSIZE	LEN	HUBOD	WEIGHT	ETS	SUBDIRECTORY	DWGNAME	ROTATION_X_AXIS		
0.1250	1.0000	0.8750	0.0900	3	C:\CADWorx 2017\Plant\Specs\CustomOverlays	CustomClamp_00125.dwg	0		
0.2500	1.0000	0.8750	0.1100	3	C:\CADWorx 2017\Plant\Specs\CustomOverlays	CustomClamp_00250.dwg	0		
0.3750	1.0000	1.0000	0.1600	3	C:\CADWorx 2017\Plant\Specs\CustomOverlays	CustomClamp_00375.dwg	0		
0.5000	1.1250	1.3125	0.2900	3	C:\CADWorx 2017\Plant\Specs\CustomOverlays	CustomClamp_00500.dwg	0		
0.7500	1.3750	1.5000	0.4200	3	C:\CADWorx 2017\Plant\Specs\CustomOverlays	CustomClamp_00750.dwg	0		
1.0000	1.5000	1.8125	0.5900	3	C:\CADWorx 2017\Plant\Specs\CustomOverlays	CustomClamp_01000.dwg	0		

Specifications – Catalog Data Tables

28) Use Orifice taps on the flange data tables

OTD	Orifice Tab Diameter	OTD	OTA	OTN
OTA	Orifice Tab Angle	0.5000	45.00	8
OTN	Orifice Tab Number			



29) Use Excel like formulas in the spec editor

$$=MAINSIZE * 1.5$$

Specifications – PRJ Tips

- 30) Set your defaults in your catalog and PRJ
- 31) Use custom colors for non engineered and specialty items
- 32) Use long description formats
=DESC_CMP_TBL, MAINSCH_SCH_TBL, SPEC_MAT_TBL GRADE_MAT_TBL, STANDARD_CMP_TBL
- 33) Use Schedule Assignment Tables & Use Material Assignment Tables
- 34) Use custom data in your PRJ to track status data in your model
- 35) Export your specs for checking

Long Description Accuracy

36) Use find tab on line view palette to keep an eye on your BOM

Search Options:	
Tag:	
Code:	
Line number:	
Short annotation:	
Long annotation:	pipe
Id Count:	
Components filtered by Long annotation (52)	
PIPE, SCH 40, ASTM A106 GR B	
PIPE, SCH STD, ASTM A106 GR B	
PIPE, SCH STD, ASTM A106 GR B	
PIPE, SCH STD, ASTM A106 GR B	
PIPE, SCH STD, ASTM A106 GR B	

37) Use database to fix Long Descriptions

Line Numbering

- 38) Use line numbers in static mode
- 39) Use line numbers from your PID database.
- 40) Use line view palette
- 41) Create line view filters
 - Issue Stages
 - Stress Stages
 - Services
 - Specs

Line Routing

42) Use Routing Command

Pick end point or [component List/Slope/sKew/Elevation/Plane /Reference/Fitting mode/elBow type/Undo/Connect/Toggle length/Alignment]:

43) Use Connect option in pipe routing

44) Use BOP Alignment option to route pipe on top of pipe supports

Specify start point or [**A**lignment/**R**eference] <last point>:

45) Use the Elevation option when routing pipe to drop an elbow down

46) Swap a support using the Design Grip

Creating Isos

- 47) Place all data into model for no touch ISOs
- 48) ISOGEN Data - Use the ICEDIT command
- 49) Isogen Start and Stop signs
- 50) Use Discontinuity Palette

Isogen Data (1 of 1)

Symbol Information:
Identifier: VALVE-ANGLE ☐ Overwrite
SKEY: ARFL ☐ Overwrite

Spindle/Flat/Support Direction:
Direction: None
Mark:

Flow Arrow:
☒ As drawn ☐ Opposite View

Miter Pipe Export Options:
☐ Pipe with welds
☐ Bend
☐ Bend with length

End Connections and Conditions:

End 1: FL View
☐ Male
☐ Female
☐ Unspecified
☒ None

End 2: FL View
☐ Male
☐ Female
☐ Unspecified
☒ None

End 3: Default View
☐ Male
☐ Female
☐ Unspecified
☐ None

End 4: Default View
☐ Male
☐ Female
☐ Unspecified
☐ None

Reference Dimensions:
☒ On
☒ Primary ☐ Skewed Pick points View
Message: SKID\$CORNER
SKEY: VST

Start point:
X: 60039.7358
Y: 60797.3261
Z: 285.9950

Reference Point 1:
X: 59988.3610
Y: 60830.3262
Z: 252.0000

Reference Point 2:
X: 59988.3610
Y: 60830.3262
Z: 317.4116

Message: PSV\$303
Type: Circle
Text: PSV\$303
Other: Spool: Sketch: Dim Status: Default Sheet #: Mark:

OK Cancel Exit Help

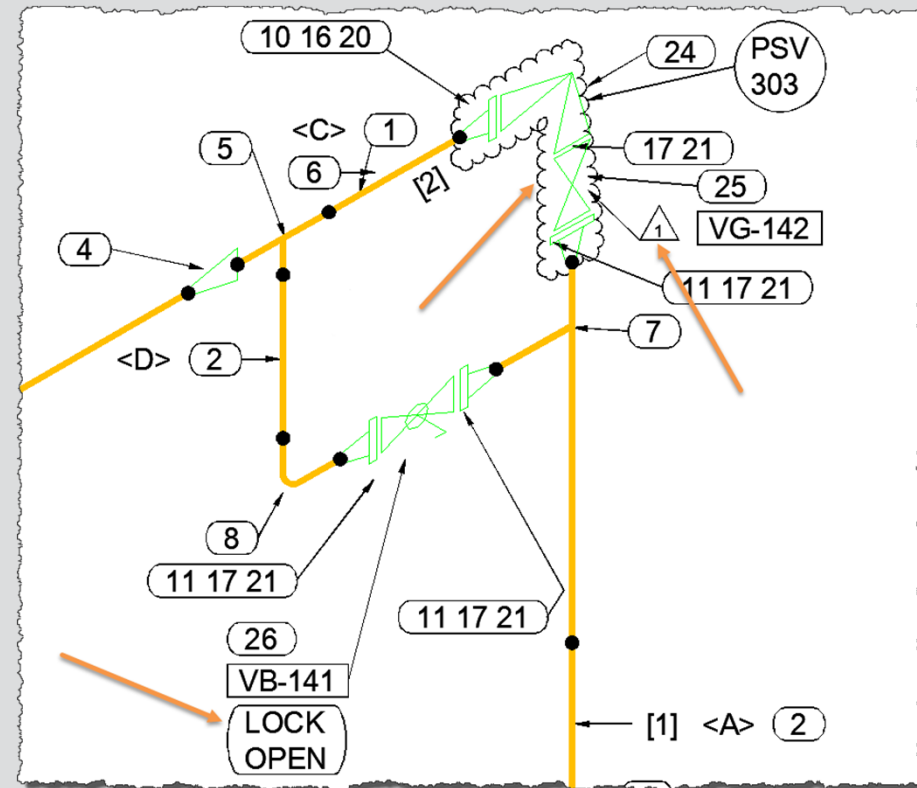
Creating Isos

51) Use custom data to label items in Isos

- MESSAGE-ROUND COMPONENT-ATTRIBUTE30
 - MESSAGE-CIRCLE
 - MESSAGE-POINTED
 - MESSAGE-SQUARE
 - MESSAGE-UNBOXED
 - MESSAGE-DIAMOND
 - MESSAGE-ROUND
 - MESSAGE-TRIANGLE

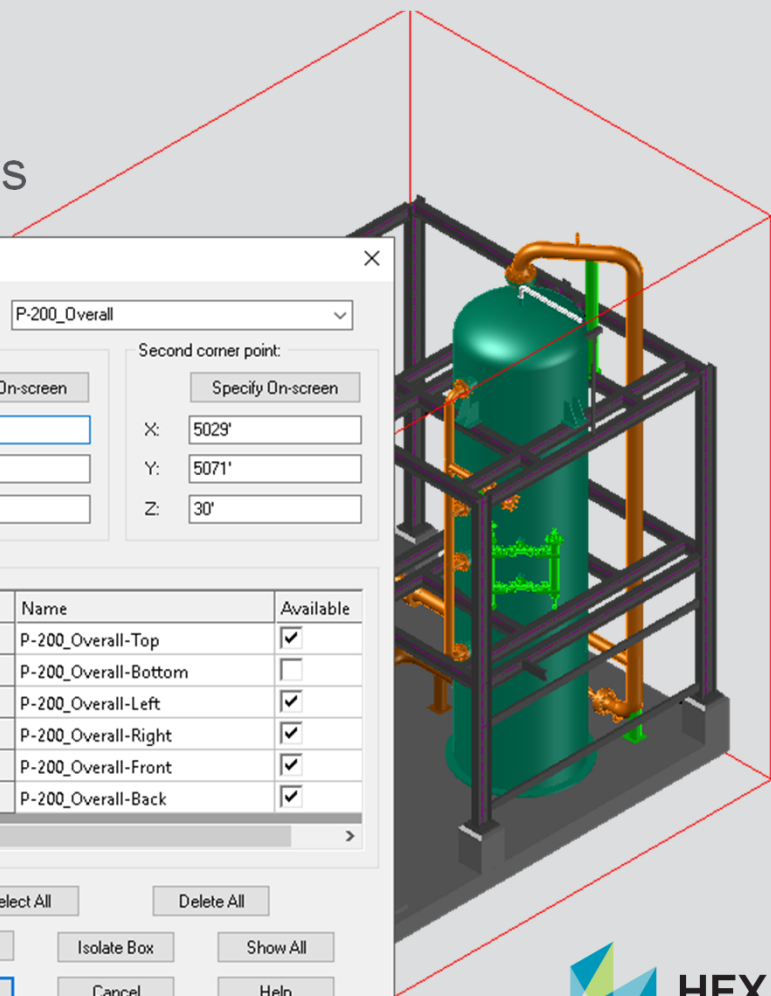
52) Use Pipeline Attributes to automate DWG Attributes

53) Automatically add Revision Clouds in IConfigure



Viewbox

54) Use Viewbox to quickly create saved views



View Editing

View set name: P-200_Overall

First corner point:

Specify On-screen

X: 4996 Y: 5048 Z: -1'

Second corner point:

Specify On-screen

X: 5029 Y: 5071 Z: 30'

Views:

View Type	Name	Available
Top	P-200_Overall-Top	☒
Bottom	P-200_Overall-Bottom	☐
Left	P-200_Overall-Left	☒
Right	P-200_Overall-Right	☒
Front	P-200_Overall-Front	☒
Back	P-200_Overall-Back	☒

< >

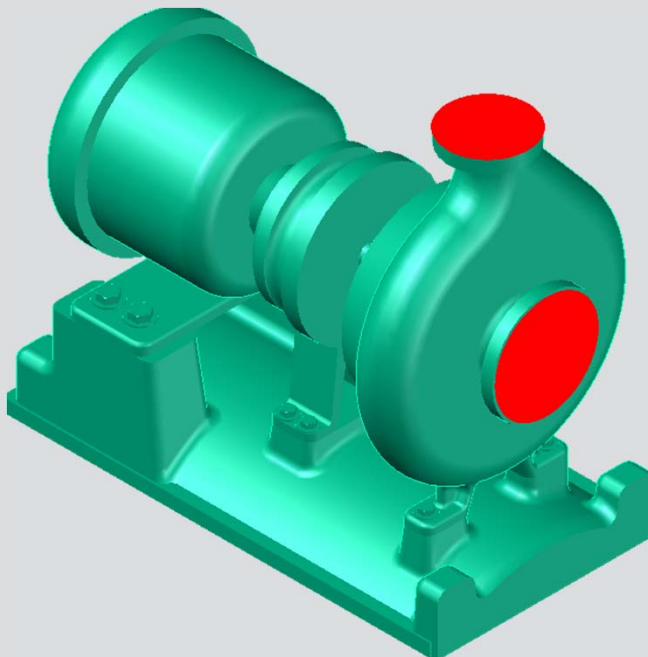
Select All Delete All

Set Current Isolate Box Show All

OK Cancel Help

Equipment

- 55) Use the equipment palette
- 56) Don't use AutoCAD commands on equipment
- 57) Use generic nozzle attach



Equipment Name:
P-101A

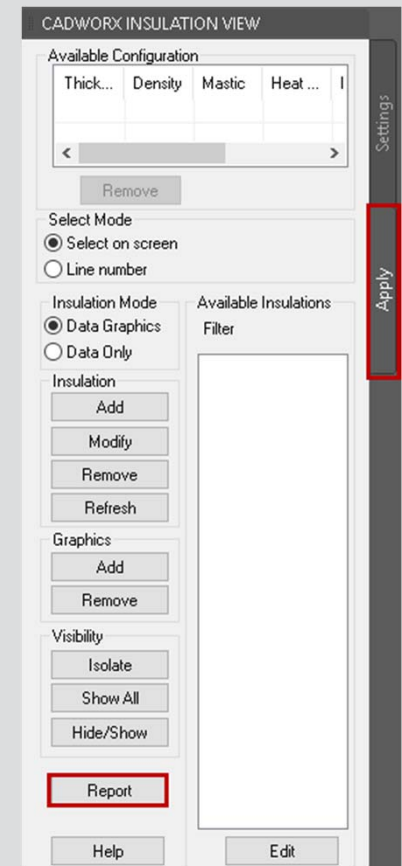
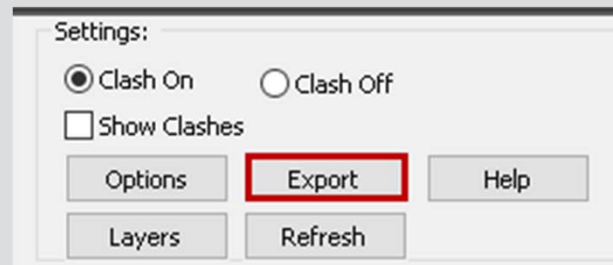
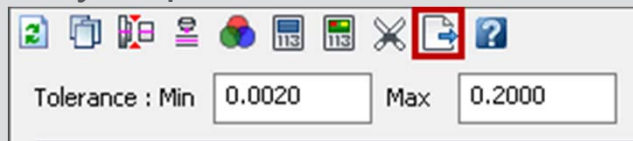
Placement Components

☒ Impeller	
Description	
Width	6.000000
Diameter	29.000000
Extension diameter	6.000000
Extension length	6.000000
Flip orientation	No
☒ Pump base	
☒ Pump nozzle [SUCTION]	
Description	SUCTION
Distance	0.000000
Nozzle details	6" - 300 - LWN
Layout angle	0.00
Length	3.750000
Suction side	Yes
☒ Pump nozzle [DISCHARGE]	
☒ Shaft	
☒ Coupling	
☒ Motor	

Reports

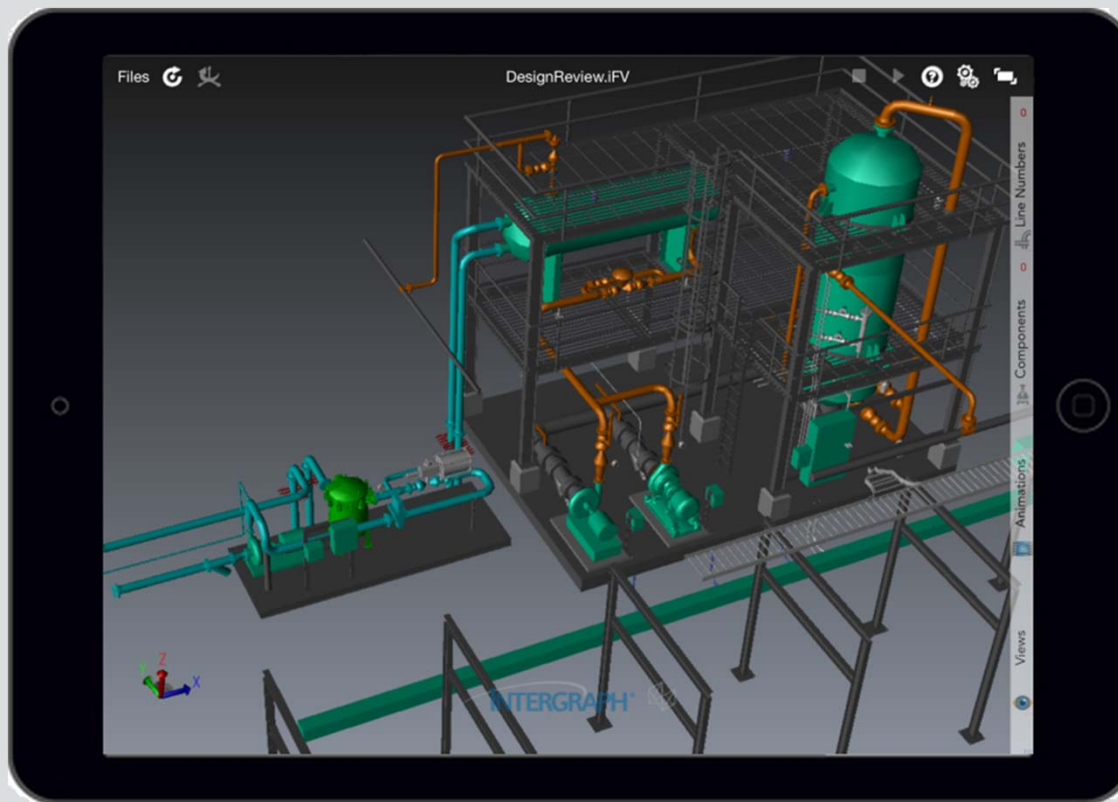
58) Gather your data in reports

- Pipe BOM
- Pipe Supports BOM
- Steel BOM
- HVAC BOM
- Insulation Reports
- Center of Gravity Reports
- Weld Total Reports
- Clash Detection Report
- Discontinuity Report



CADWorx Design Review

59) Use Design Review to create iFV files to view in the field



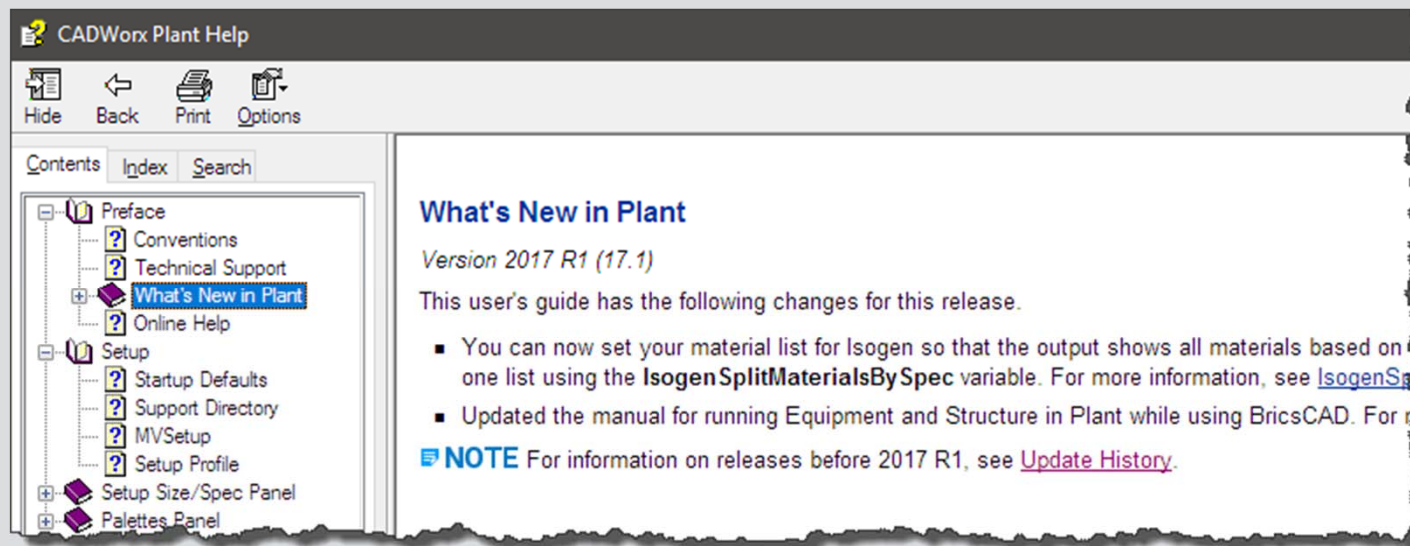
Xrefs

- 60) Never rename Xrefs
- 61) Never modify CADWorx models using REFEDIT, Use XOPEN
- 62) Xref Working Models as Overlays
- 63) Xref Overall Models as Attachments
- 64) Use Xrefs to lock your issued lines



Learning – In CADWorx

- 65) MANUAL - Learn what you already have and the new features of every release
- 66) LSP command - Learn hidden commands and variables
- 67) Forget the A-Team... Join the Beta team



Learning – Staying in the know

68) Receive notification from SmartSupport when software updates are available

- <https://smartsupport1.intergraph.com>

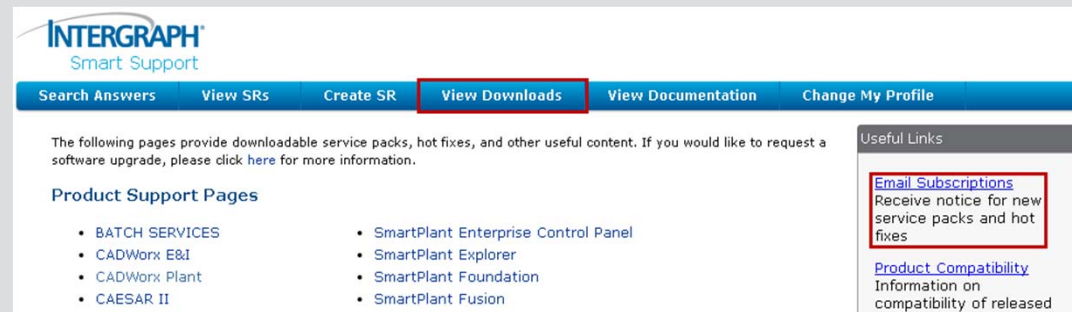
69) Follow Blogs for latest information

70) Participate on LinkedIn and forums

- CADWorx User Group
- CADWorx and Analysis University
- Intergraph CADWorx and Analysis Group

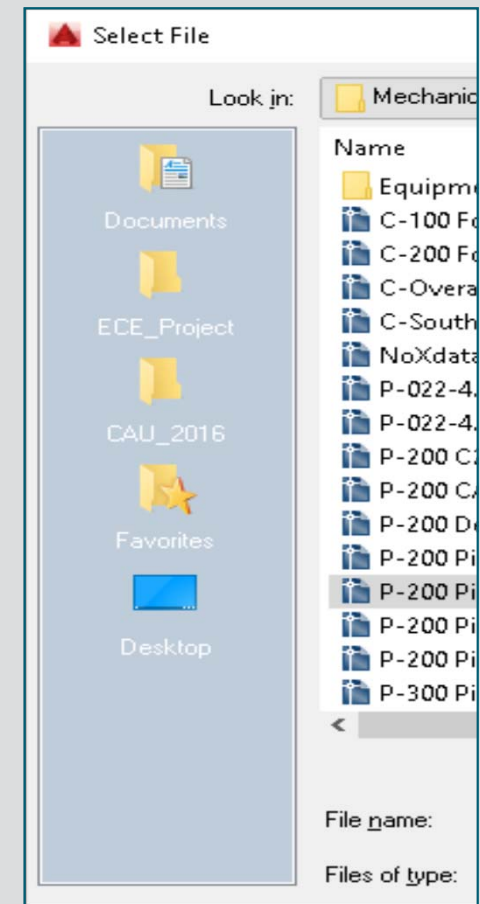
71) Get involved internally; Lunch and Learns, blogs, newsletters...

72) Network with as many experts that are here as you can



Customization

- 73) Customize open file dialog shortcut folders
- 74) Type your commands
- 75) Learn the Command Line options
- 76) Change command line settings to search layers and sysvars
- 77) Use the command lines learning capabilities
- 78) Create you own quick key commands
- 79) Learn to read XData

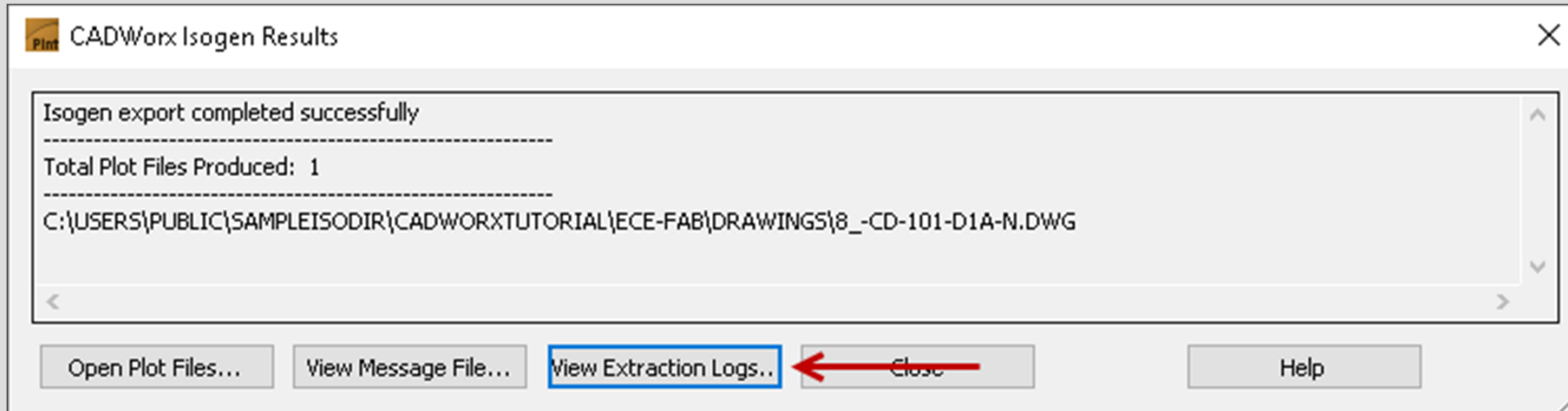


Time Savers

- 80) Use heads up display dynmode = 3
- 81) Use copy array - Pipe Racks
- 82) Rotate with Copy option
- 83) Use different view styles at different times - Don't always stay in Rendered mode
- 84) Shift Middle Mouse Orbit (ORBITAUTOTARGET)
- 85) Use in canvas tools to switch between saved views
- 86) View Cube use WCS - Turn off View Cube

Troubleshooting

- 87) Use vanilla AutoCAD to recover the files.
- 88) Recover models using the database
- 89) Vars2scr to compare variables to another drawing
- 90) Use Isogen Export Files from IGO command for troubleshooting



THANK YOU



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