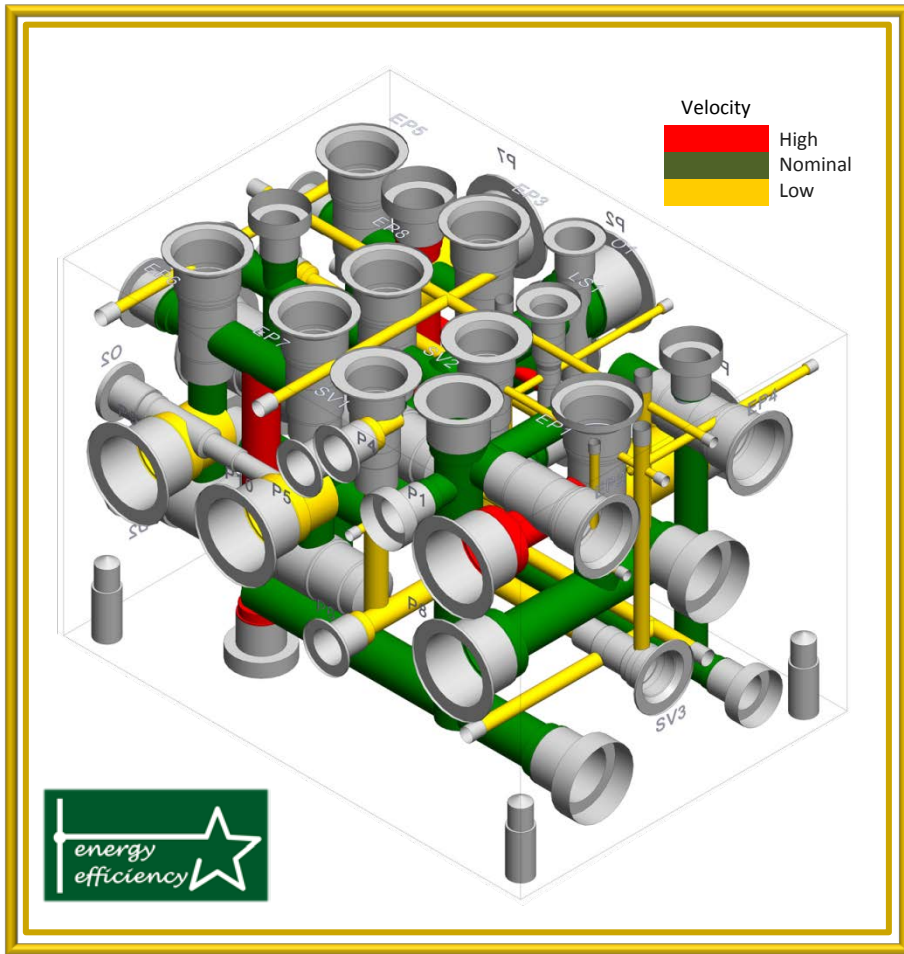


POWER-to-DESIGN MANIFOLDS

MDTools® 750 What's New



MDTools® 750 - What's New

User Interface Improved

- Re-organized Ribbon Menu
- Ribbon Menu Optimized for Large Sized Icons
- Context Flyout

Energy Efficient Design

- Energy Efficient Connections
- Energy Efficient Construction Port
- Check for Velocity Hot Spots in Blocks
- Energy Efficient Smooth Bends

Integrated Browser

- Cavity Library Integrated within the Browser
- Cavity Browser Enhanced
- Connectivity Browser Enhanced

New Interactive Functionality

- Stretch Block
- Stretch and Incline Drill
- Move Cavity or Footprint - Dragging

New Checking Functionality

- Wall thickness Check - Consolidated
- Check Connection for Offset

Misc

- Mounting Holes with Preview
- Set Manufacturing Precision

HyDraw to MDTools Integration

- Port Info Captured thro' Schematic Interface
- Auto Assemble

Recap

Contact Us

User Interface Improved



Easier access to all commands

Part Menu

The Part Menu ribbon is organized into several functional groups:

- Create:** Stretch, Cutout, Convert, Block
- Insert:** Copy, Mounting Holes, Offset Hole, Outline, Replace, Orifice Plug
- Connect:** Connect Cavities, Angular Connection
- Relocate:** Rotate, Move Multiple, Align, Swap Cavities, Move, Change Face
- Modify:** Edit, Match Properties, Delete Cavity, Flush, Add Counterbore, (Un)Constrain, Stretch, Add Drill
- Engravings:** Manage, Align
- Check:** Wall, Thickness, Distance, Connection, Design, Velocity, Bend
- View:** Color, Net, Locate, Outline, Machining ID, Create, License, User Manual

Callouts from the ribbon point to the following sub-menus:

- Block:** Shrink Wrap, Export, Import, Manifold Quote, Block
- Connect:** Assign Net, Connect
- Modify:** Suppress, Minimize Depth, Update Precision, Modify
- Check:** Manufacturing, Connection Offset, Check
- View:** Cavity ID, Net Display, Cavity Center, Remove Color, View

Drawing Menu

The Drawing Menu ribbon includes the following groups:

- Place Views:** Create Views, View
- Annotate:** Show, Hide, Internal Details
- Tools:** Auto Dimension, Dimension
- Manage:** Machining ID, Component ID, Construction Port, Display
- View:** Footprint, Angle Hole, Origin & Axis
- Get Started:** Engraved Text
- Autodesk 360:** Machining Callout, Balloon, Machining Chart, Create
- MDTools 750:** Cavity List, Component and Port List, Engraved Text Chart
- Layers:** Layers
- Settings:** Settings

Assembly Menu

The Assembly Menu ribbon includes the following groups:

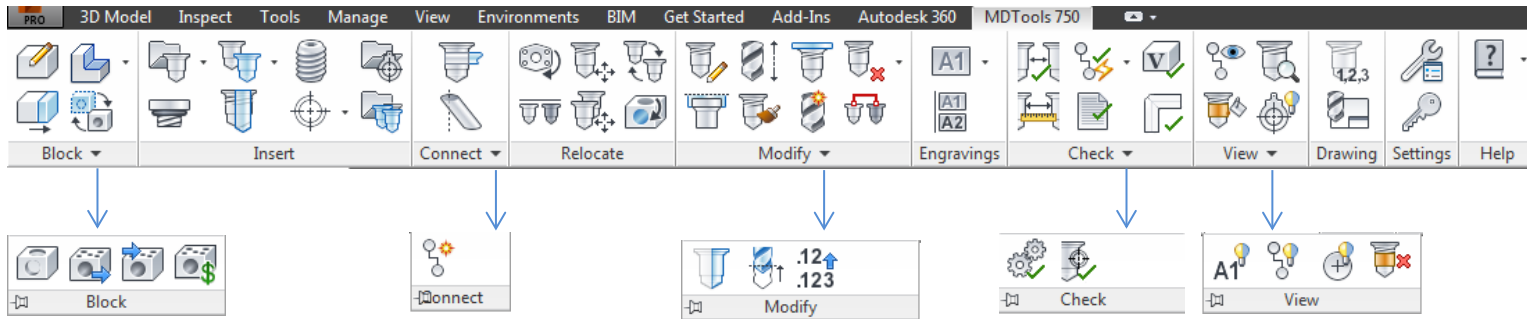
- Assemble:** Auto Assemble, Component, Plug, Assemble
- Simplify:** Simplify

Note: Switch to large-sized icons, if required

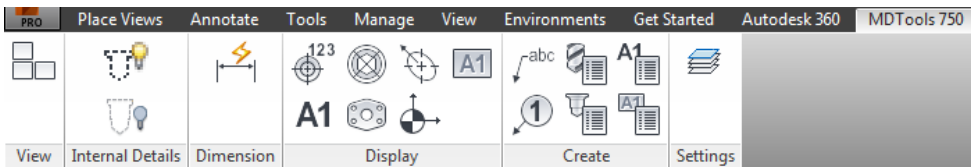


Icons redesigned
Ribbon layout optimized for easy navigation

Part Menu



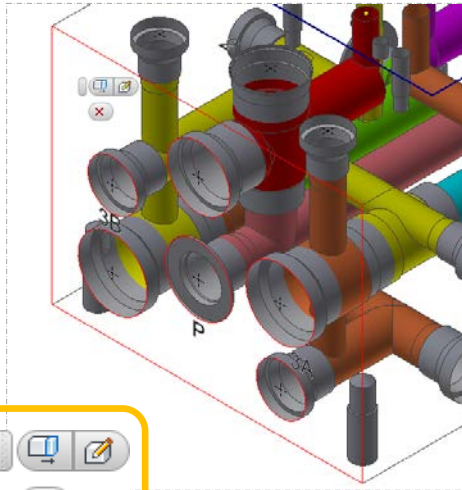
Drawing Menu



Assembly Menu

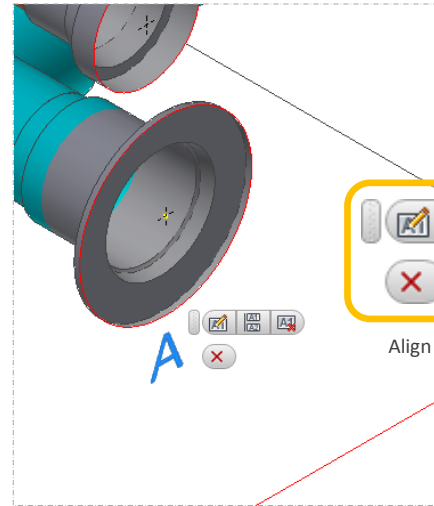


Note: Switch to small-sized icons and text legend, if required

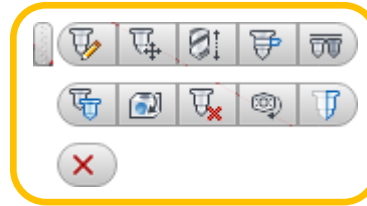
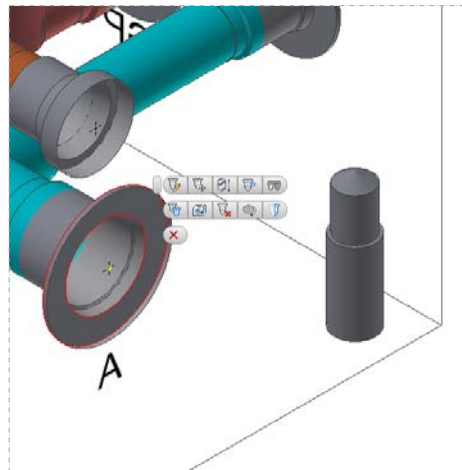


Stretch Block | Modify Block

Context Flyout appears when an object is left clicked

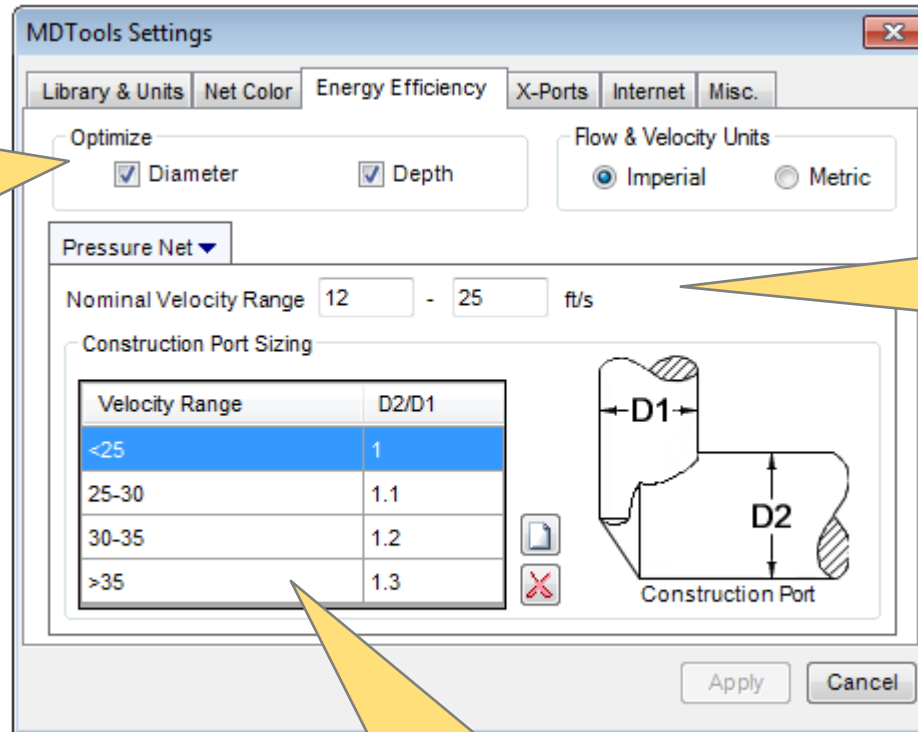


Align | Edit | Delete



Edit | Move | Stretch | Connect | Align
Copy | Change Face | Delete | Rotate | Suppress

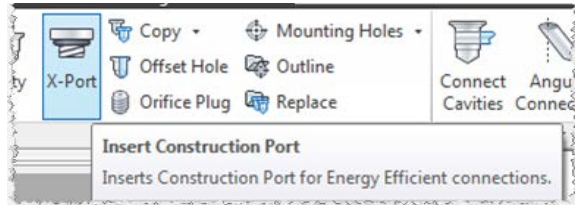
Energy Efficient Design



Setup MDTools to optimize Diameter and Depth, when making connections and inserting construction ports

Define nominal velocity range of oil flow for tank and pressure connections

Define construction hole upsizing ratio, for different velocity ranges



Insert Construction Port

Connect to

	Port	Flow (gpm)	Type
<input type="checkbox"/> Cavity1	1	12	Pressure
<input type="checkbox"/> Cavity2	1	12	Pressure

Energy Efficiency

Optimize Diameter

Construction Port

Cavity: SP-06

Drill Diameter: 0.443

Cavity ID: PLUG12

Continue Cancel

Smart Construction Port selection, based on flow values, is used when connecting ports

If Energy Efficient connection is active, then MDTools suggests Drill Diameter and Construction Port to reduce bend losses

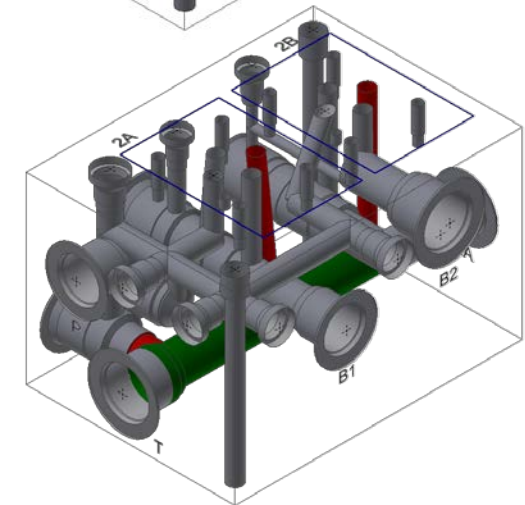
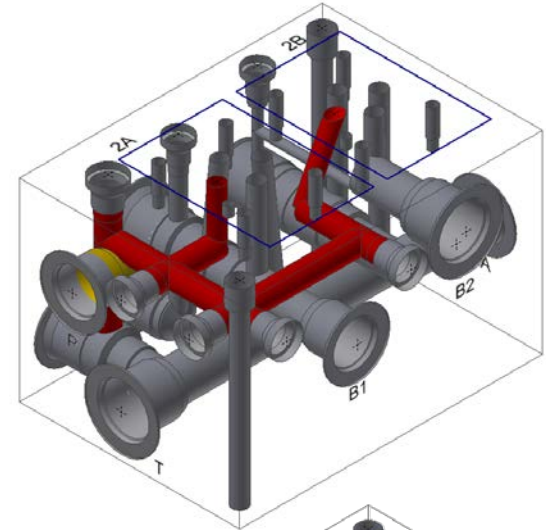
Check for Velocity Hot Spots in Blocks



Check velocity for each pressure/tank net or the complete manifold

Pressure and Tank Nets	Cavity/Port	Drill/Port Dia	Flow (gpm)	Velocity (ft/s)
All Nets				
NET-1	2A-P (D03)	0.276	13	69.7
NET-2	2B-P (D03)	0.276	13	69.7
NET-3	PLUG3 (SP-04)	0.375	13	37.8
NET-4	PLUG5 (SP-04)	0.375	13	37.8
NET-5	PLUG2 (SP-04)	0.375	13	37.8
NET-6	PLUG1 (SP-04)	0.375	13	37.8
NET-7	PLUG6 (SP-04)	0.375	13	37.8
NET-8	P (#8 SAE)	0.656	13	12.3
	3-2 (VC10-2)	0.406	13	-

Pressure Net Velocity: ■ High ■ Nominal [15-25 ft/s] ■ Low



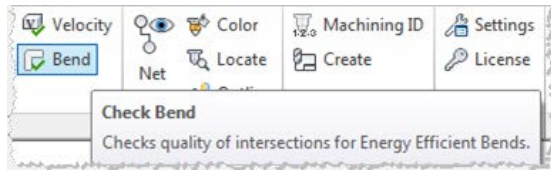
Each tank and pressure connection is color coded for oil velocities

Red – High
Green – Nominal [9-15 ft/s]
Yellow – Low

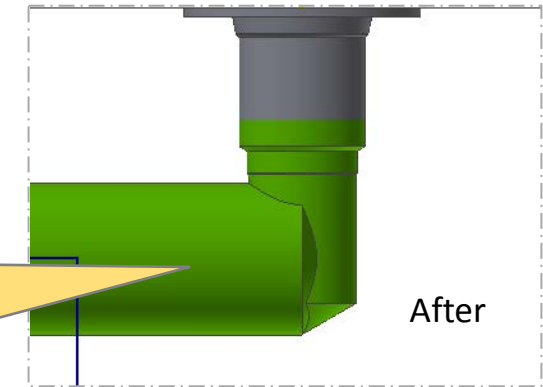
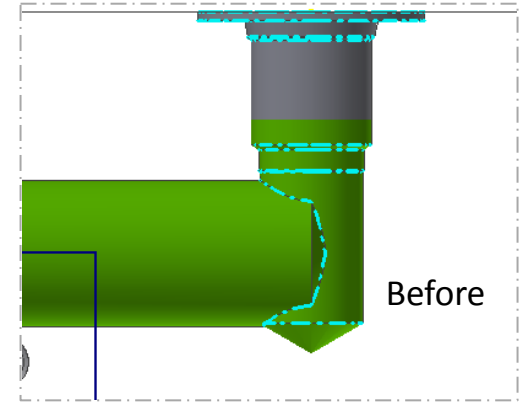
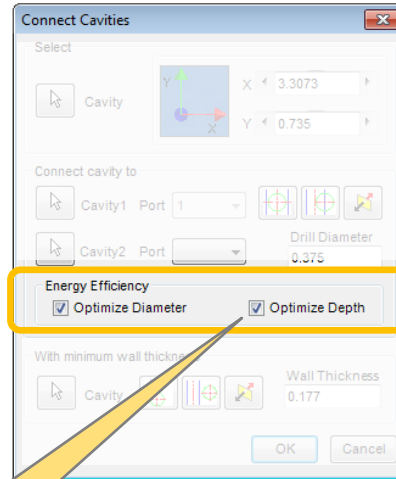
Pressure and Tank Nets	Cavity/Port	Drill/Port Dia	Flow (gpm)	Velocity (ft/s)
All Nets				
NET-1	2A-T (D03)	0.276	16	85.8
NET-2	2B-T (D03)	0.276	16	85.8
NET-3	3-1 (VC10-2)	0.563	16	20.6
NET-4	T (#10 SAE)	0.672	16	14.5
NET-5				
NET-6				
NET-7				
NET-8				

Pressure Net Velocity: ■ High ■ Nominal [9-15 ft/s] ■ Low

Energy Efficient Smooth Bends



Cavity	Connecting Cavity	Current Depth	Recommended Depth
<input type="checkbox"/> 5-T	T	1.083	0.926
<input type="checkbox"/> A	GA	1.587	1.578
<input checked="" type="checkbox"/> GB	3B-1	1.239	1.139
<input type="checkbox"/> GP	P	1.16	0.689
<input type="checkbox"/> PLUG11	PLUG2	1.681	1.716
<input type="checkbox"/> PLUG2	PLUG11	3.774	3.81
<input type="checkbox"/> PLUG3	PLUG9	2.819	2.854
<input type="checkbox"/> PLUG5	PLUG4	3.18	3.084
<input type="checkbox"/> PLUG7	PLUG8	3.001	3.036
<input type="checkbox"/> T	5-T	2.405	2.404



In Energy Efficient mode, MDTools automatically creates a smooth bend by optimizing drill depth

MDTools checks and smoothens bends in manifold at the end of the design process

Integrated Browser

Cavity Library Integrated within the Browser

NEW

Search for a cavity/footprint by Name

Cavity Library integrated within the Browser

For Energy Efficient Design, enter Flow and Port Type before inserting the cavity

MDTools 750

Model Cavity Library HyDraw Schematic

Library

All Libraries

Cavity/Footprint

Enter Name to Search...

- #10-24 UNC
- #10 SAE
- #12 SAE
- #14 SAE
- #16 SAE
- #2 SAE
- #20 SAE
- #24 SAE
- #3 SAE
- #32 SAE
- #4 SAE
- #4 SAE-1/4"-28 UNF
- #4 SAE-5/16"-24 UNF
- #5 SAE
- #6-32 UNC
- #6 SAE
- #6 SAE-7/16"-20 UNF
- #6 SAE-CV
- #8-32 UNC
- #8 SAE
- #8 SAE-5/8"-18 UNF
- #8 SAE-9/16"-18 UNF
- 0.0625
- 0.125
- 0.146 NSD
- 0.15625
- 0.1875
- 0.21875
- 0.25
- 0.28125
- 0.3125
- 0.34375

Port Information

Port	Flow	Type	Net Name
1	12	Pressure	Net-1
2	12	Pressure	Net-2

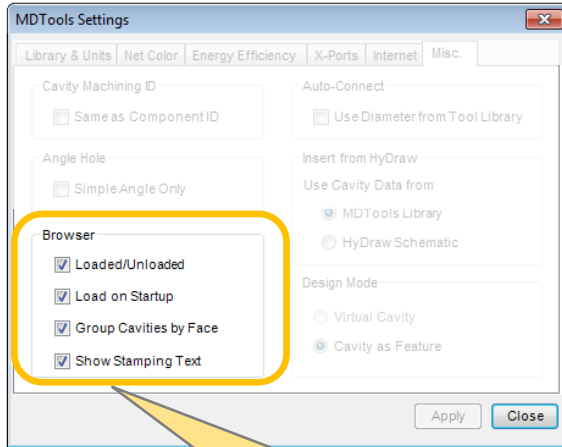
Clear values on Insertion

Component ID

Construction Port

Cavity Browser Enhanced

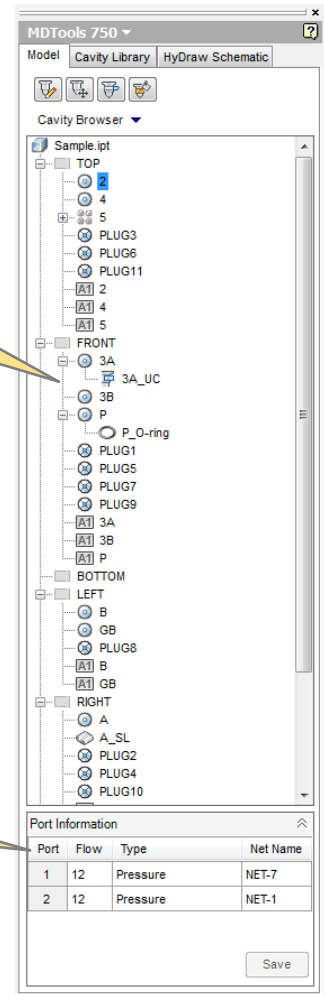
NEW



Cavity Browser, now also shows stamping text

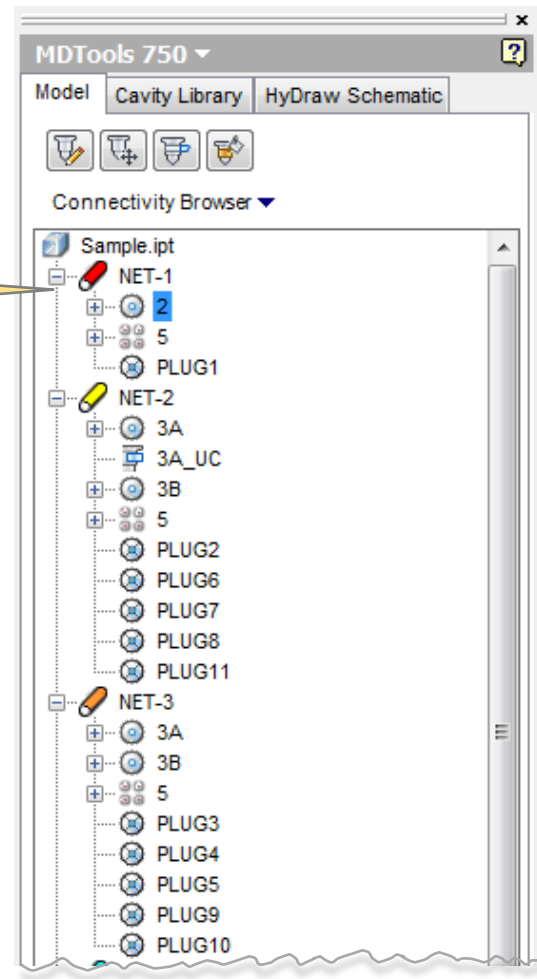
Separate icons used for each feature to easily distinguish between various features

Edit Port Information directly in the browser

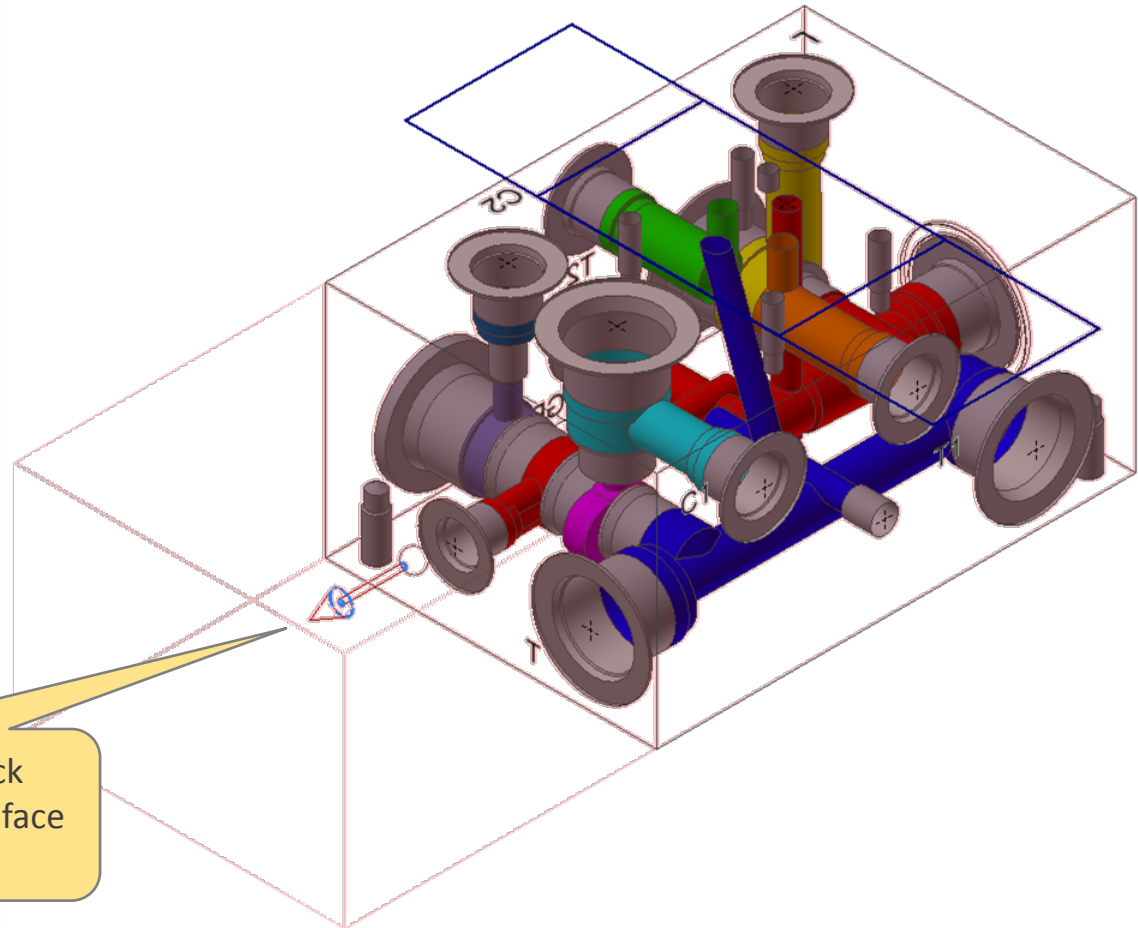
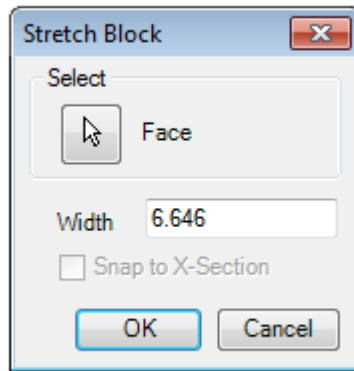
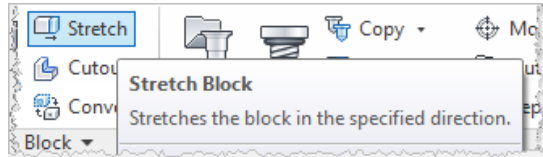




Colored Net icons enhance the visual recognition of nets in Connectivity Browser

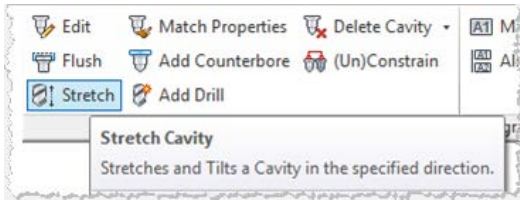


New Interactive Functionality

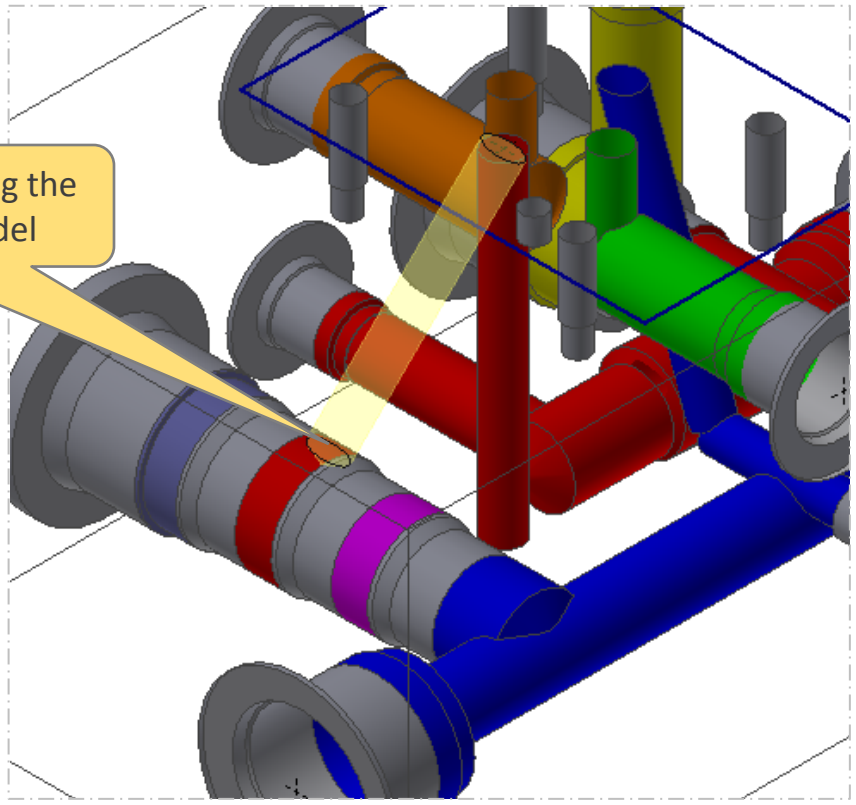


Stretch and change the block size by dragging a manifold face in the model

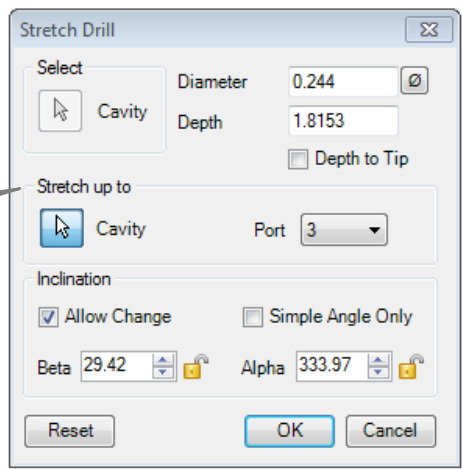
Stretch and Incline Drill



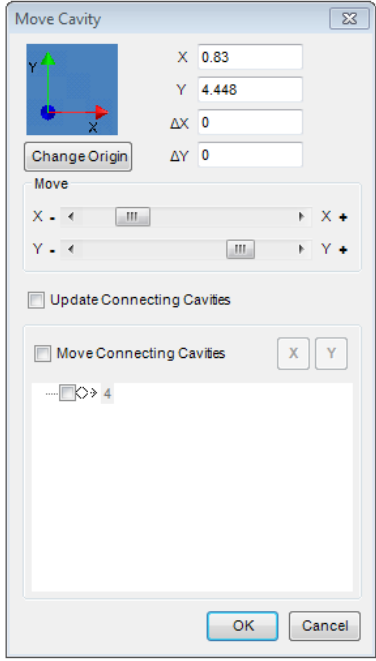
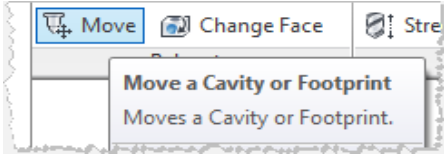
Incline a drill by dragging the drill tip point in the model



Stretch a drill up to a cavity (port)
Allow inclination and view the angular change in the model

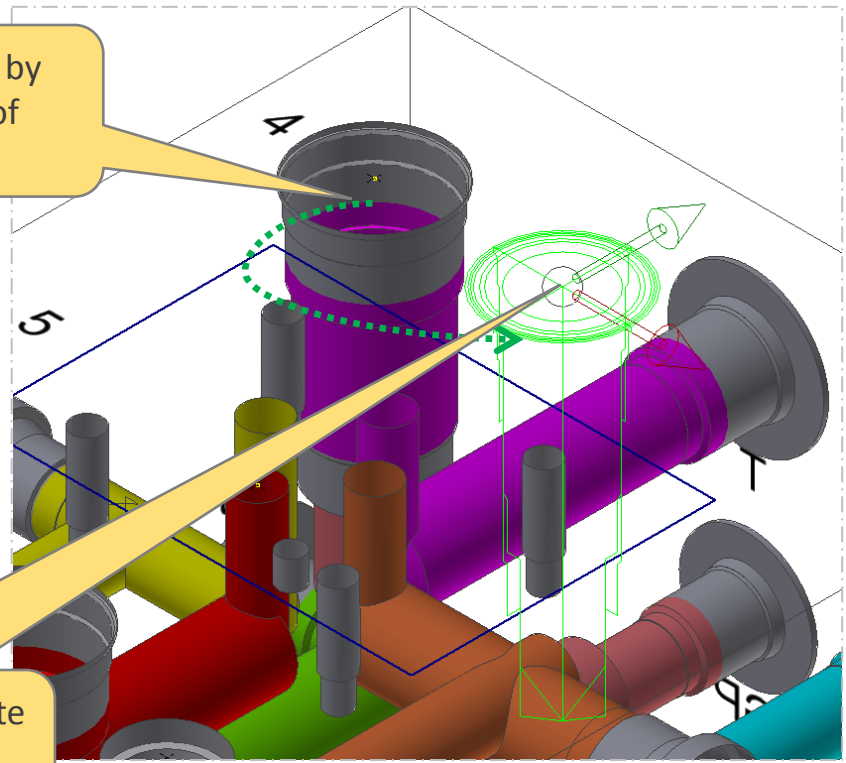


Move Cavity or Footprint - Dragging



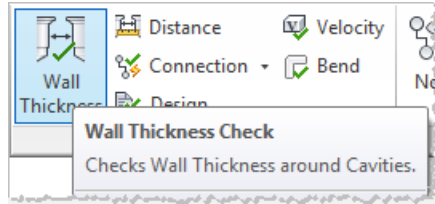
Move a cavity in the model by dragging the center point of the selected cavity

Move a cavity along an ordinate by grabbing one of the directional arrows



New Checking Functionality

Wall thickness Check - Consolidated



Various options to check wall thickness are consolidated in a single window

Check

Around all cavities
 Around selected cavities
 Between selected cavities

Clear Selection

Check for

Min. Wall Thickness: 0.177
 Include Manifold Faces

Status: Completed 100 %

Report

Clearance List

Cavity	Cavities with Wall Thickness < 0.177
2-D	PLUG2[NET-2] (0.138)
3B-D	MBolt1(0.044)
5-BH3	5-LP(0.12)
PLUG1[NET-1]	PLUG4[NET-3] (0.17)
PLUG2[NET-2]	PLUG7[NET-2] (0.037)
P[NET-7]	PLUG10[NET-3] (0.102)
P[NET-7]	PLUG2[NET-2] (0.163)

Clearance with Spot Face

Cavity	Cavities with Wall Thickness < 0.177
3A-D	PLUG9-D(0.053)

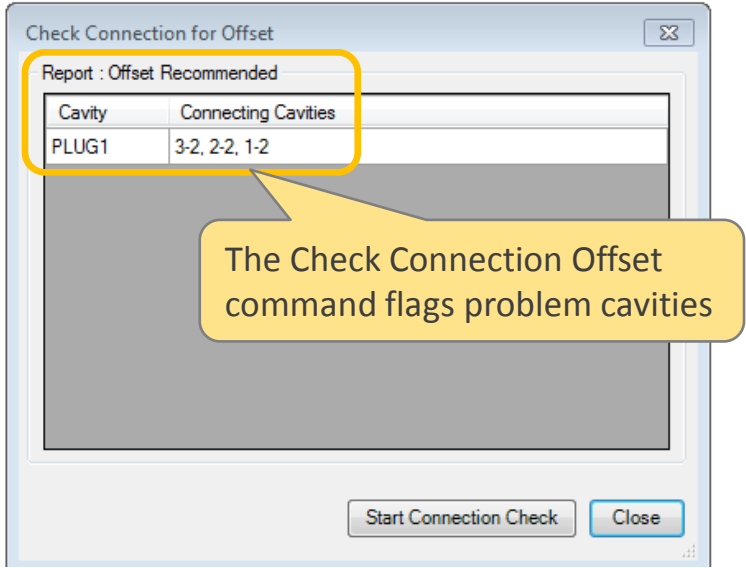
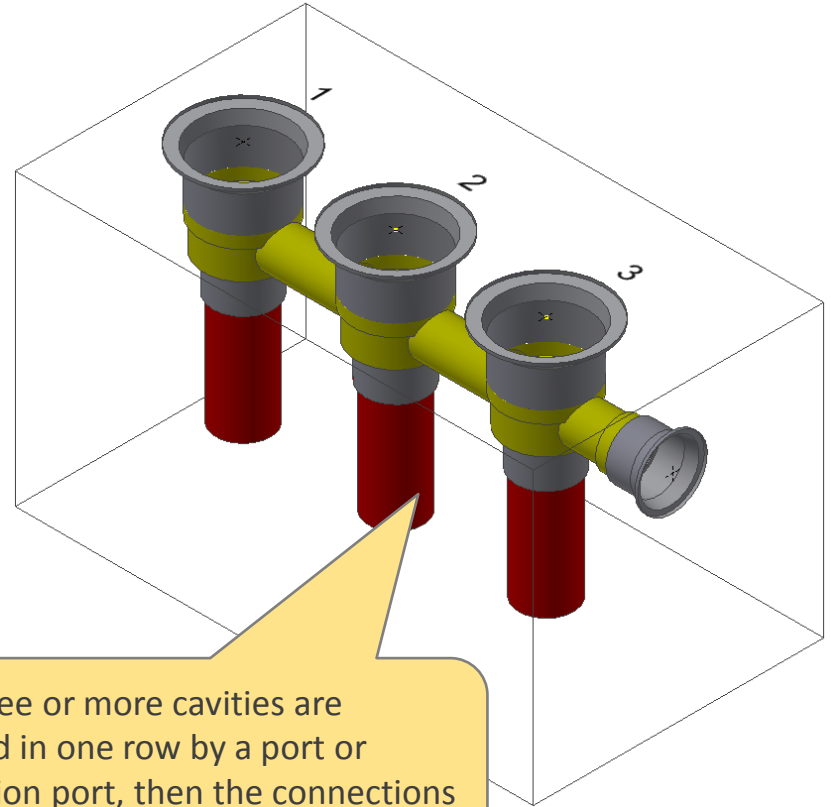
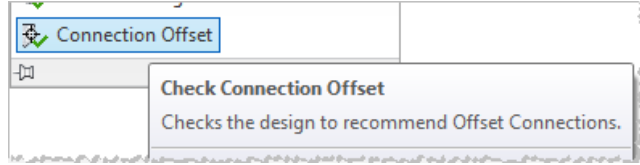
Clearance with Manifold Face

Cavity	Faces with Wall Thickness < 0.177
MBolt1-D	Left Face (0.044)
MBolt1-D	Front Face (0.044)
MBolt2-D	Left Face (0.044)
MBolt2-D	Rear Face (0.044)
MBolt3-D	Right Face (0.044)
MBolt3-D	Front Face (0.044)
MBolt4-D	Right Face (0.044)
MBolt4-D	Rear Face (0.044)

Start Wall Thickness Check Close

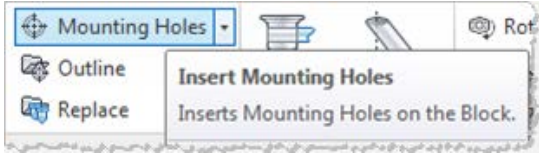
Report includes Clearance with Manifold Face

View the report in a text file or print it

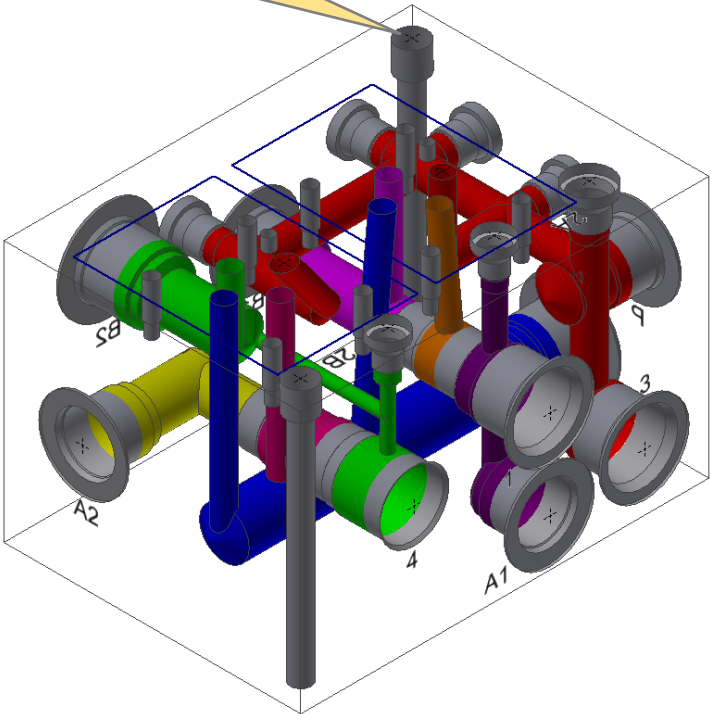


When three or more cavities are connected in one row by a port or construction port, then the connections may need to be offset

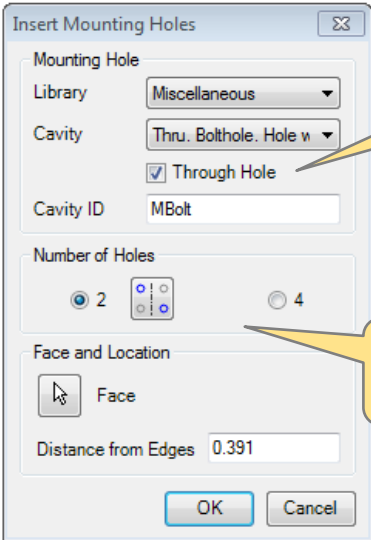
Misc



Easily place mounting holes with the help of a preview



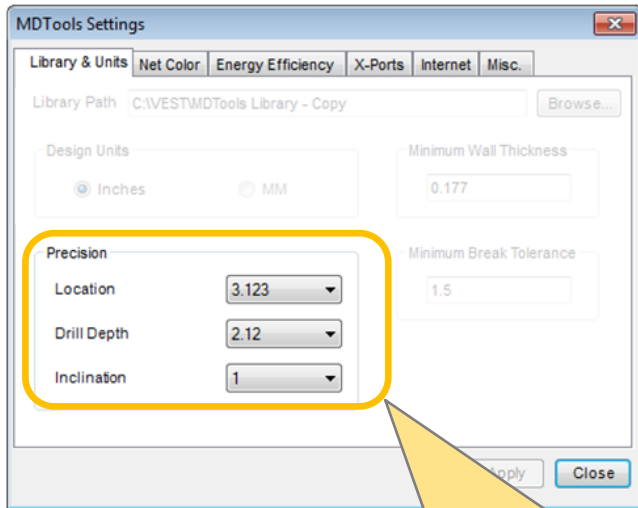
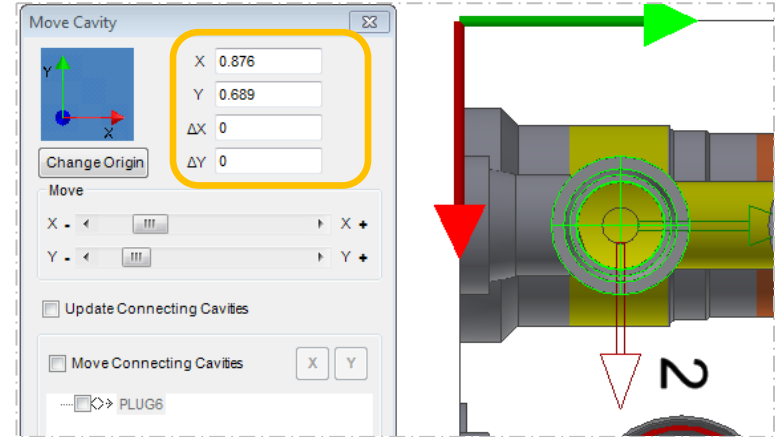
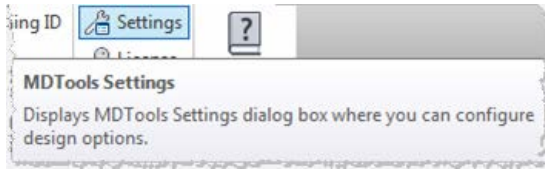
Through Hole option to insert through holes



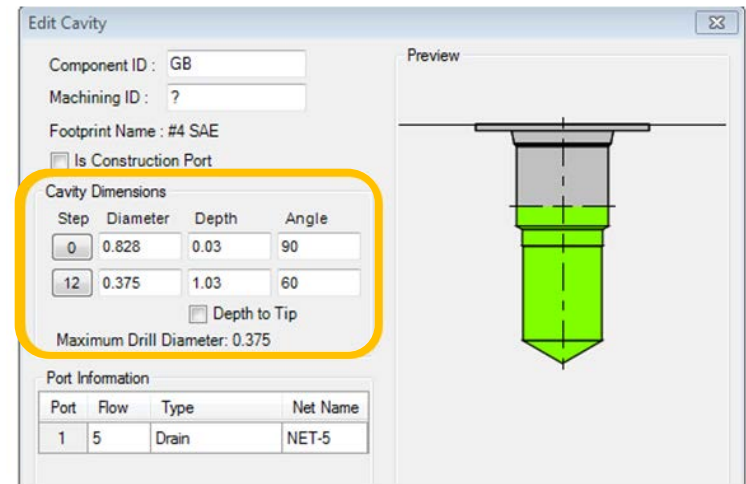
Specify the number of holes (either 2 or 4)

Set Manufacturing Precision

NEW



Manufacturing precision values defined at the start of the manifold design process are used by MDTools through out the design process



HyDraw to MDTools Integration

Port Info Captured thro' Schematic Interface



MDTools 750

Model | Cavity Library | HyDraw Schematic

Schematic File
C:\Users\Chanakya Bhogara\Dropbox\Office\WIPM

Manifold Properties

Design Unit: INCH
Material: Aluminum
Mounting Face: Bottom

Components and External Ports

Cavity Browser

- Components
 - 2A
 - 2B
 - 3
 - 4
- Ports
 - A
 - B
 - GA
 - GB
 - GP
 - P

Cavity Information | Port Information

Cavity Name	T-10A
Stamping	1
Component Outline	<input checked="" type="checkbox"/>
Preferred Faces	Top, Front, Left, Right, Back

Insert

Construction Ports

Cavity Name: SP-04

Flush

Insert

Mounting Hole

Cavity Name: 5/16"-18 UNC

Number of Holes: 4

Through Hole

Insert

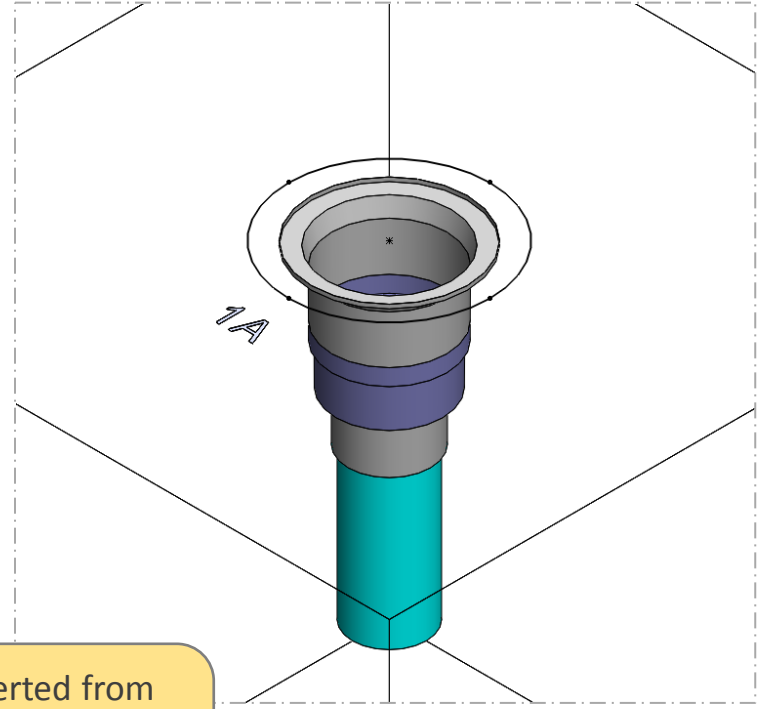
MDTools insertion of Component Outline, Stamping Text, Construction Port, and Mounting Hole defined in the HyDraw Schematic tab page

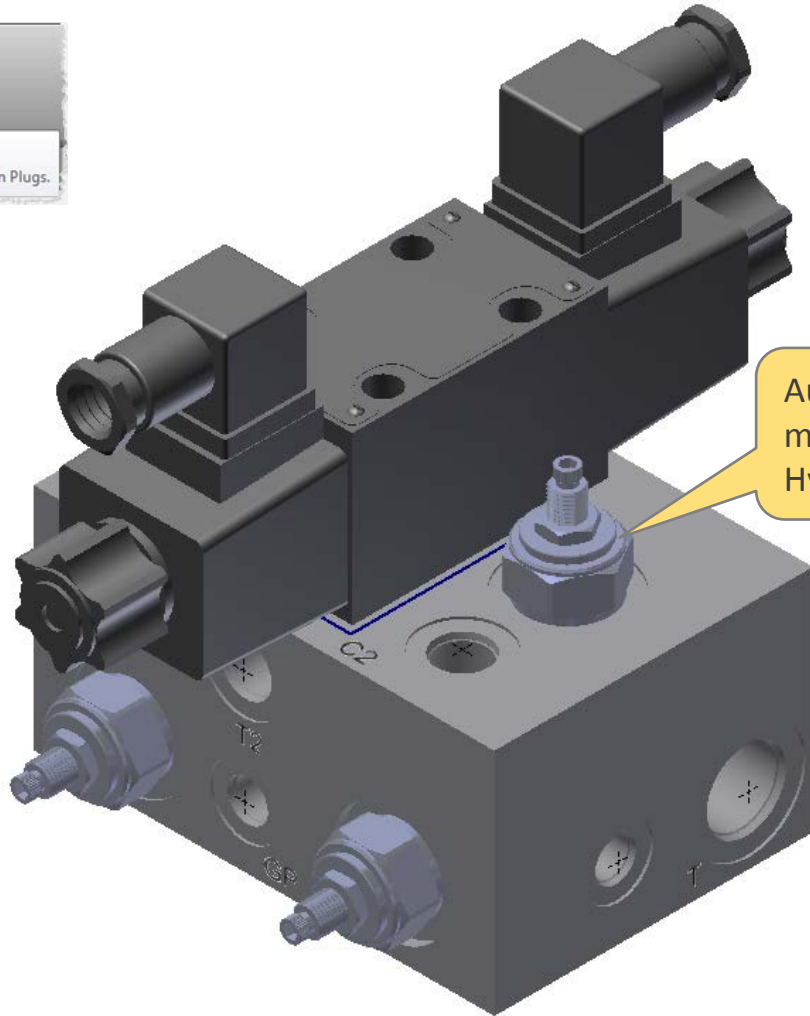
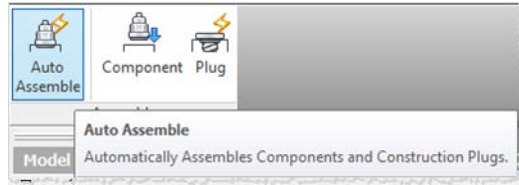
Cavity Information | Port Information

Port	Flow	Type	Net Name
1	8	Pressure	NET-3
2	8	Pressure	NET-7

Insert

When cavities are inserted from HyDraw Schematic, each cavity pulls in flow and port type information automatically





Auto Assemble all valve models from links in HyDraw Schematic

Recap

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HyDraw to MDTools Integration

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- Auto Assemble

Do more...

MDTools® manifold design software



MDTools 750 Evaluation Software

Call: +1 (248) 649-9550

Email: sales@VESTusa.com

Visit: www.VESTusa.com

