SolidWorks Routing

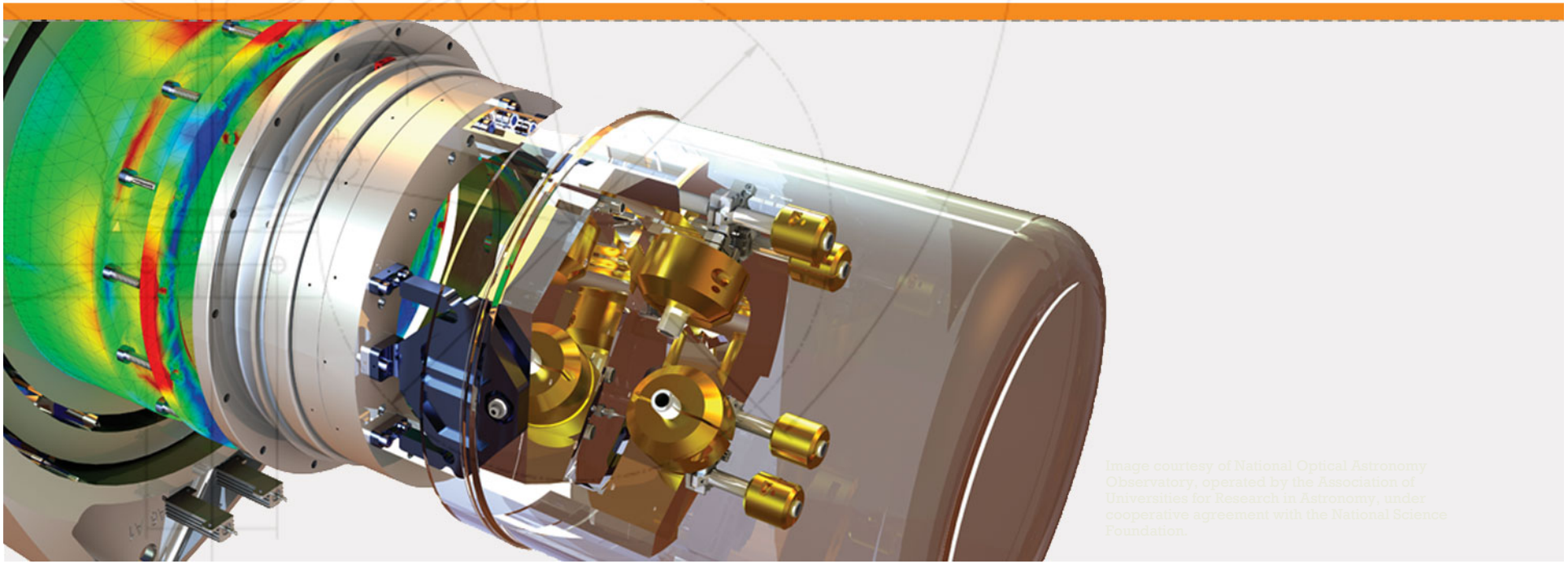
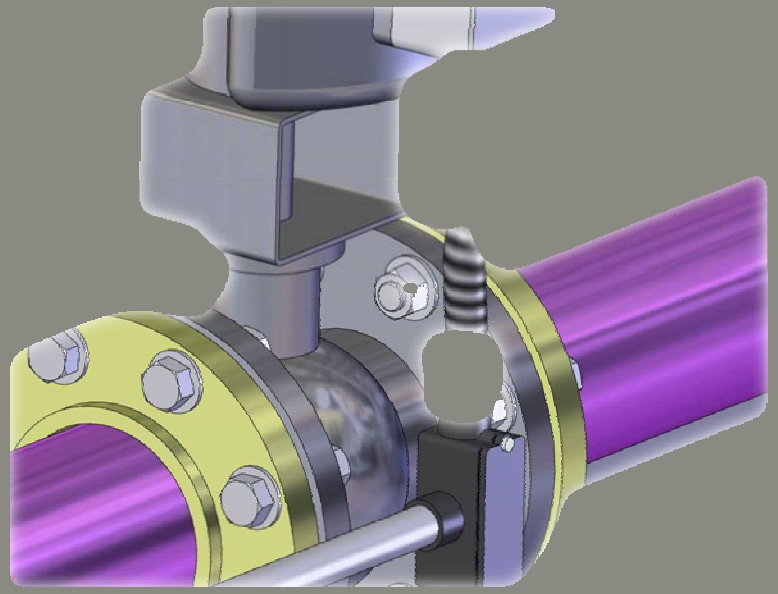


Image courtesy of National Optical Astronomy Observatory, operated by the Association of Universities for Research in Astronomy, under cooperative agreement with the National Science Foundation.

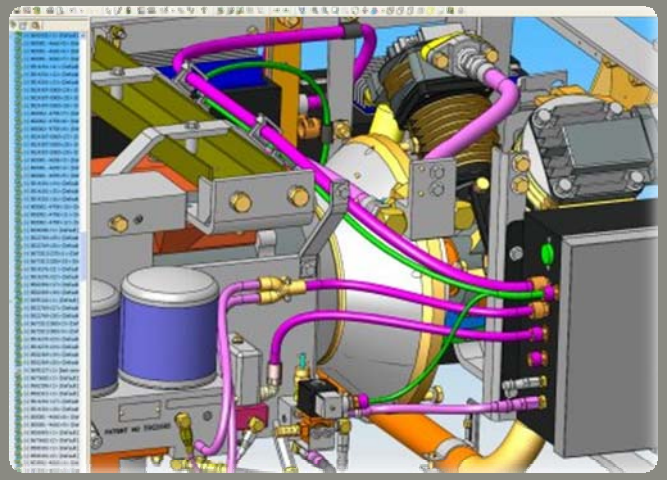
Overview

- What is SolidWorks Routing?
- How does it work?
- How is it useful in the design process?
- Practical Examples?

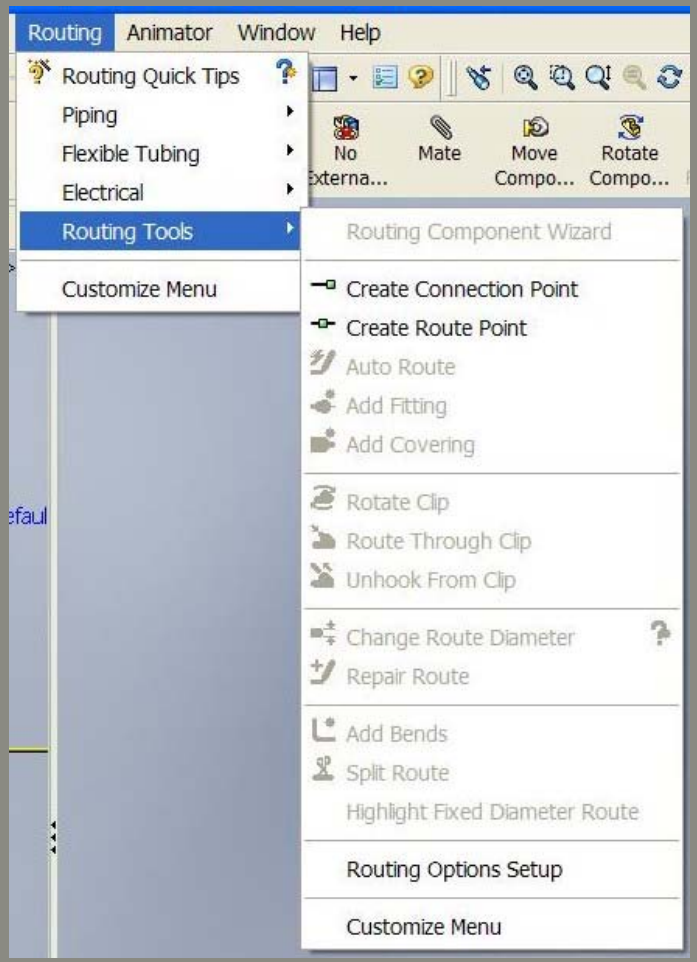


What is SolidWorks Routing

- Part of a set of innovative design tools used to simplify the design of piping tubing and electrical cable systems

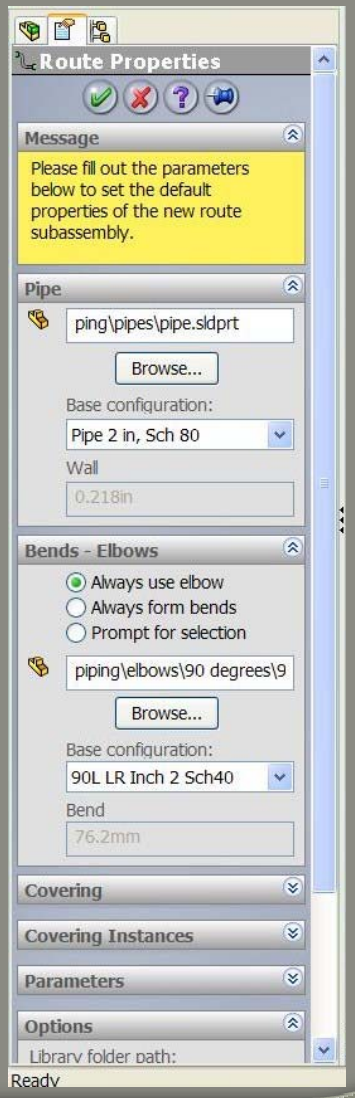


Menus and Toolbars



Rigid Piping

- After creating an assembly drag and drop fixtures such as flange from parts library
- Specify the nominal diameter and schedule of the pipe to be used through the routing properties tool
- Routes are created in the context of an assembly using sketch tools in the 3-D environment



Rigid Piping

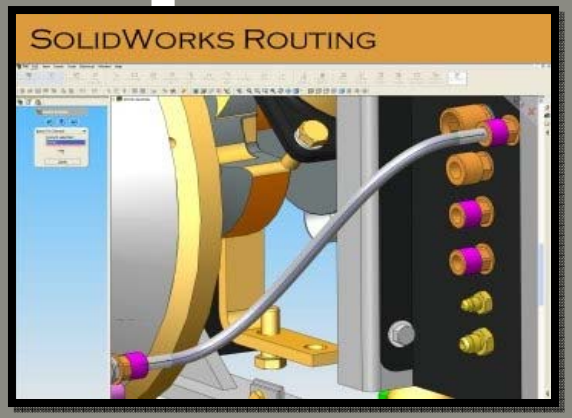
- As the assembly is created, pipe bends are automatically added
- If bend radiuses are not standard, custom bends will be generated
- Associations between routed components may be added in order to minimize human errors
- Routes may be modified using the drag and drop feature

Electrical Routing

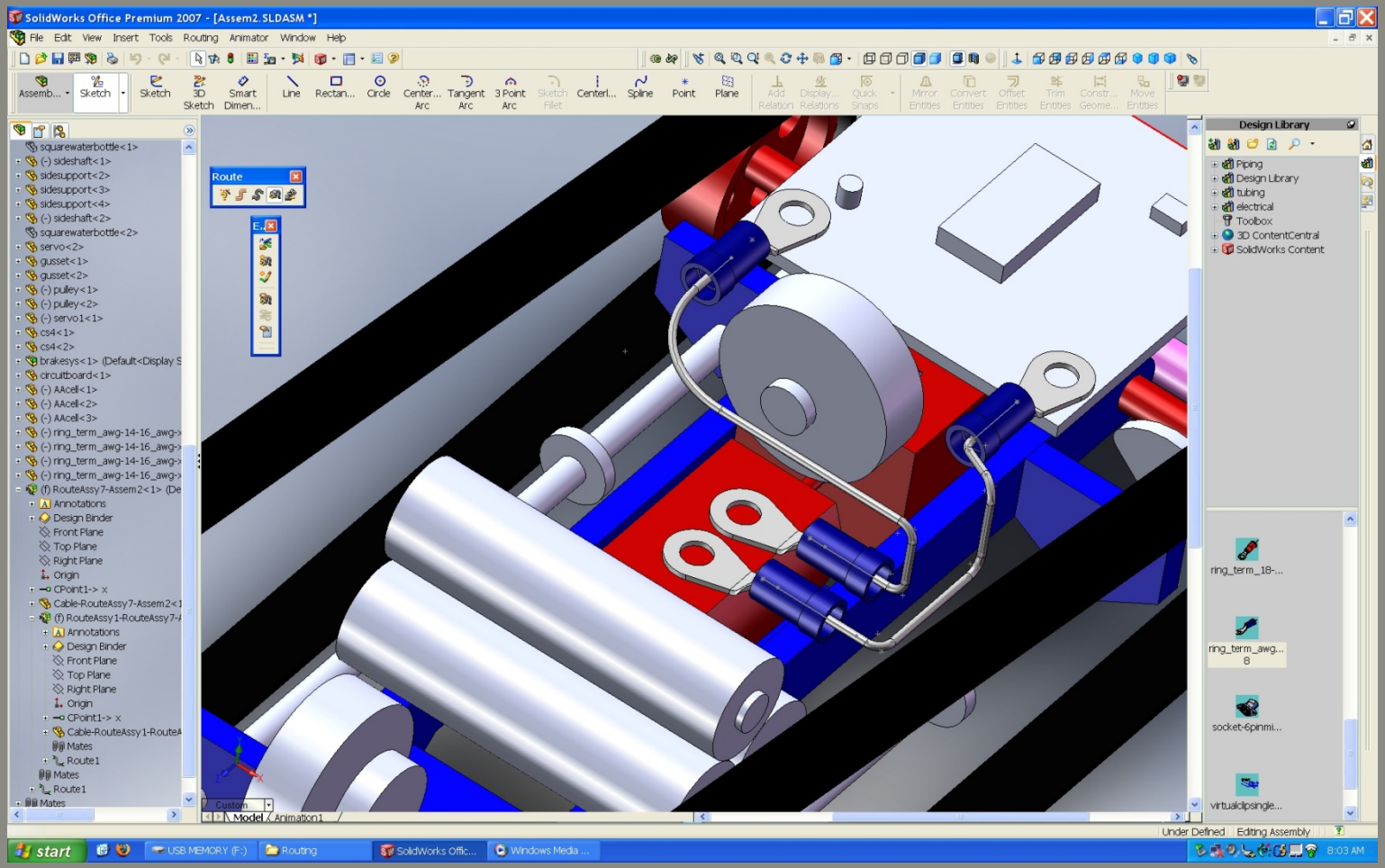
- Similar to piping
- Allows quick and easy connections between electrical components and harnesses
- Allows for routing of cables directly between components or through cable clips
- Previously routed cables can be easily modified using drag and drop feature

Electrical Routing

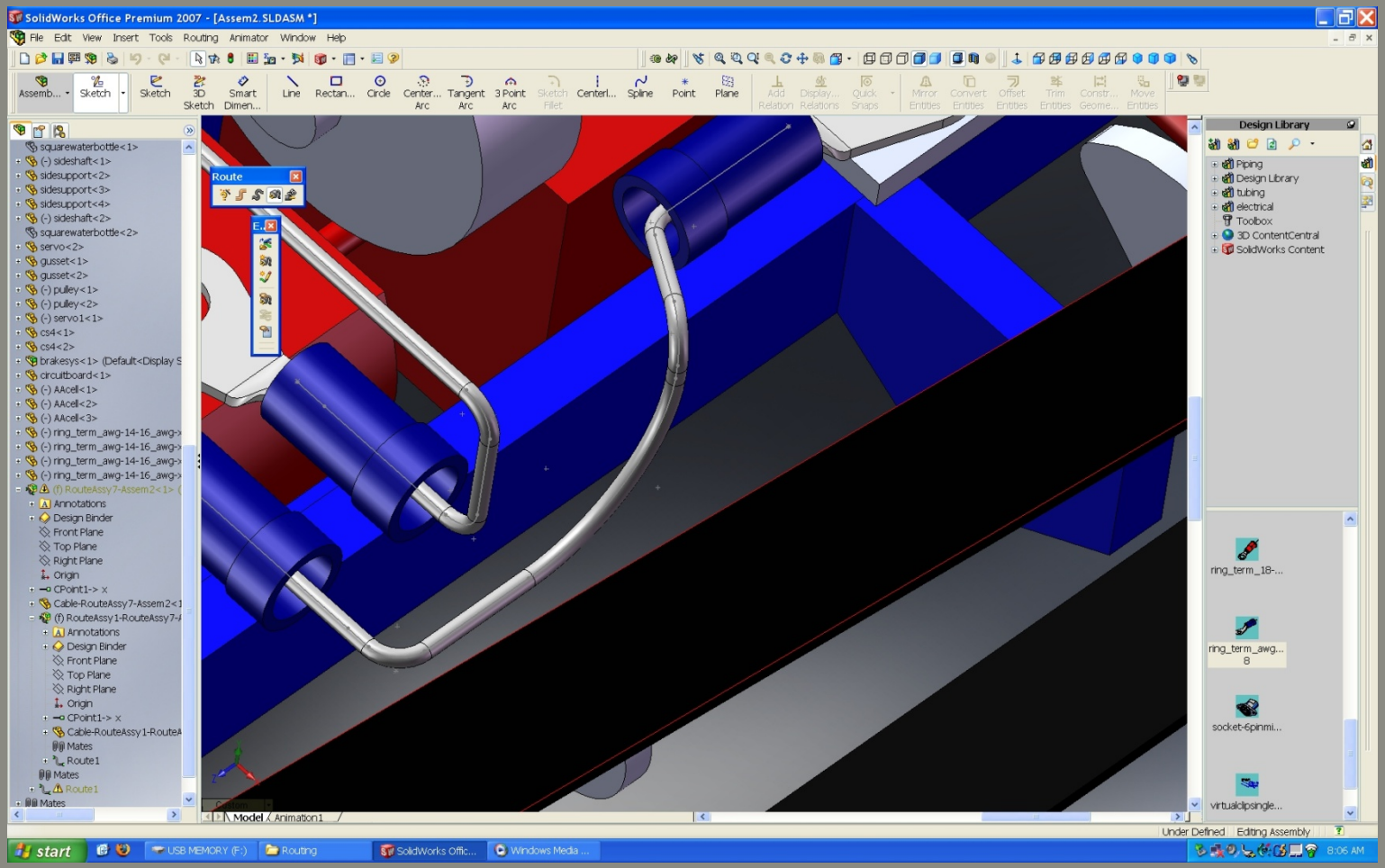
- Routes can be sketched using standard sketching tools such as lines and splines
- Segment length will be calculated according to bend radii in cable
- SolidWorks will highlight areas where bend radii are too sharp for specified cable diameter



Electrical Routing



Electrical Routing

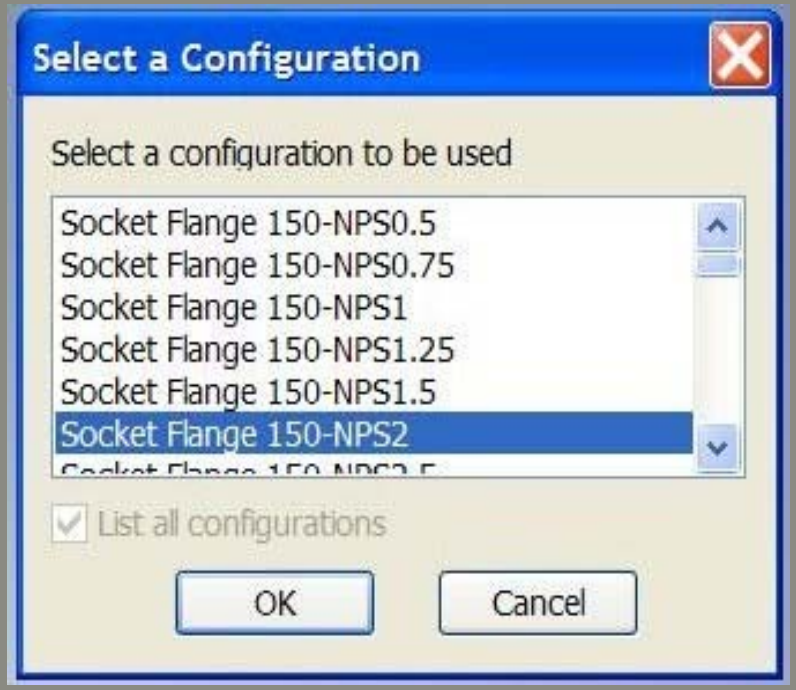


Auto Routing

- Auto routing between two points allows for quick review of several routing options
- Allows for optimization of space and material being used
- Also quickly screens for possible interference issues

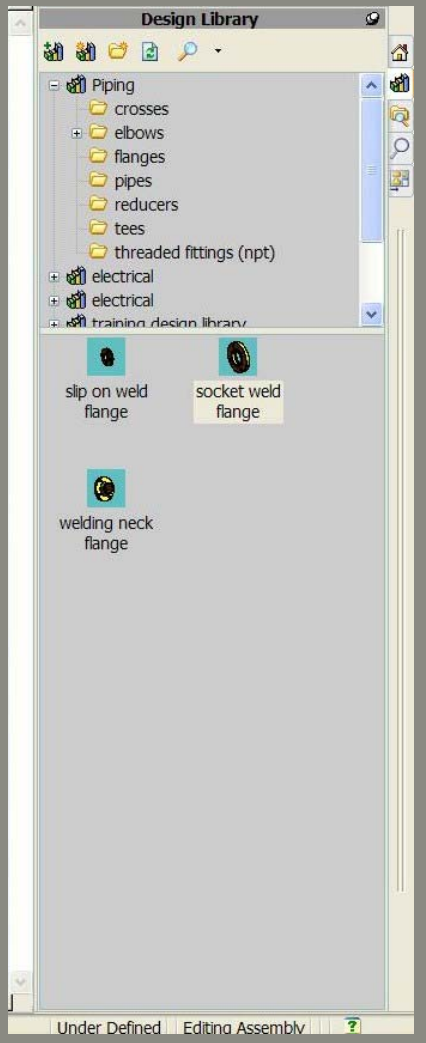
Design Library

- SolidWorks design library has various pre-made components such as valves, electrical harnesses etc.
- Use of design tables provides an extensive selection of available parts and fittings
- Fittings will automatically associate the proper dimensions when dropped into a pre-existing route



Design Library

- To save time, entire assemblies such as ball valves and pin connectors are available
- Additional components can be easily added to a route using drag and drop function
- Cable routes can be modified to run through added components such as clips
- For piping, appropriate length and diameter of pipe will be added to route

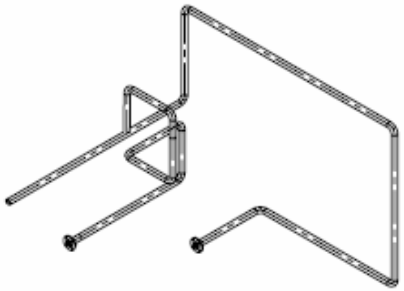


Engineered Piping Drawings

- After route has be completed an SolidWorks can create and engineered drawing showing an isometric view of the piping
- A bill of materials showing the fittings as well as appropriate lengths of pipe and cuts can also be generated and placed in drawing

Engineered Piping Drawing

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	Socket Flange 150-NPS2		2
2	90L LR Inch 2 Sch40		10
3	2 in, Schedule 80, 1		2
4	Pipe 2 in, Sch 80		1
5	Pipe 2 in, Sch 80		1
6	Pipe 2 in, Sch 80		1
7	Pipe 2 in, Sch 80		1
8	2 in, Schedule 80, 6		7
9	Pipe 2 in, Sch 80		1



		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±	DRAWN		
			CHECKED		
			ENG APPR.		
			MFG APPR.		
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.		
		MATERIAL	COMMENTS:		
NEXT ASSY	USED ON	FINISH			
APPLICATION		DO NOT SCALE DRAWING			

PROPRIETARY AND CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF <INSERT COMPANY NAME HERE>. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF <INSERT COMPANY NAME HERE> IS PROHIBITED.

TITLE:

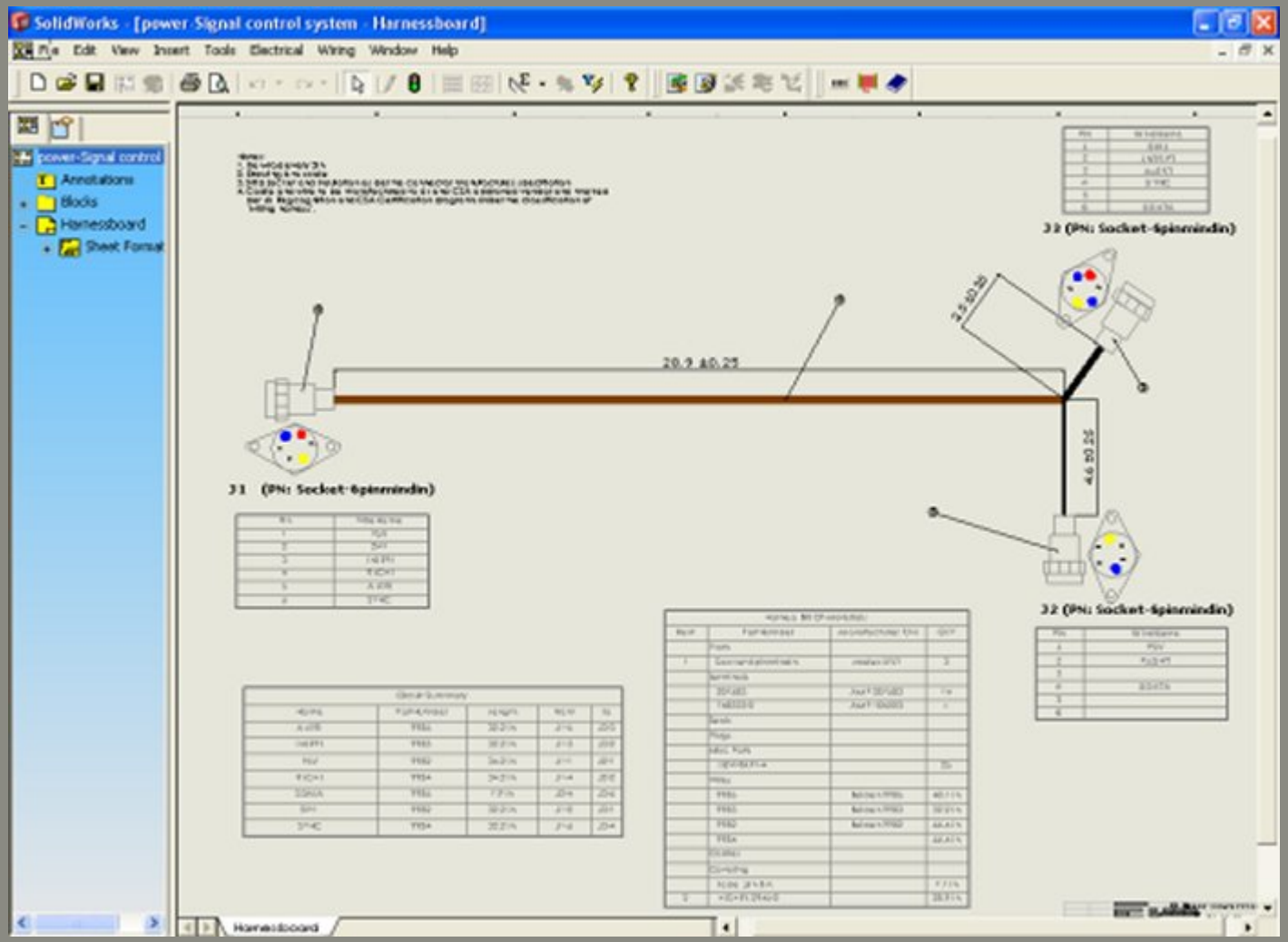
SIZE	DWG. NO.	REV
A	Piping	
SCALE: 1:50	WEIGHT:	SHEET 1 OF 1

5 4 3 2 1

Engineered Electrical Drawings

- After cable routing has been created, a 2-D cable diagram of the 3-D configuration can be created
- A bill of materials can be automatically inserted to document cable lengths as well as harness connections
- Information on connectors including pin and cable color can also be added to match the color coded drawing

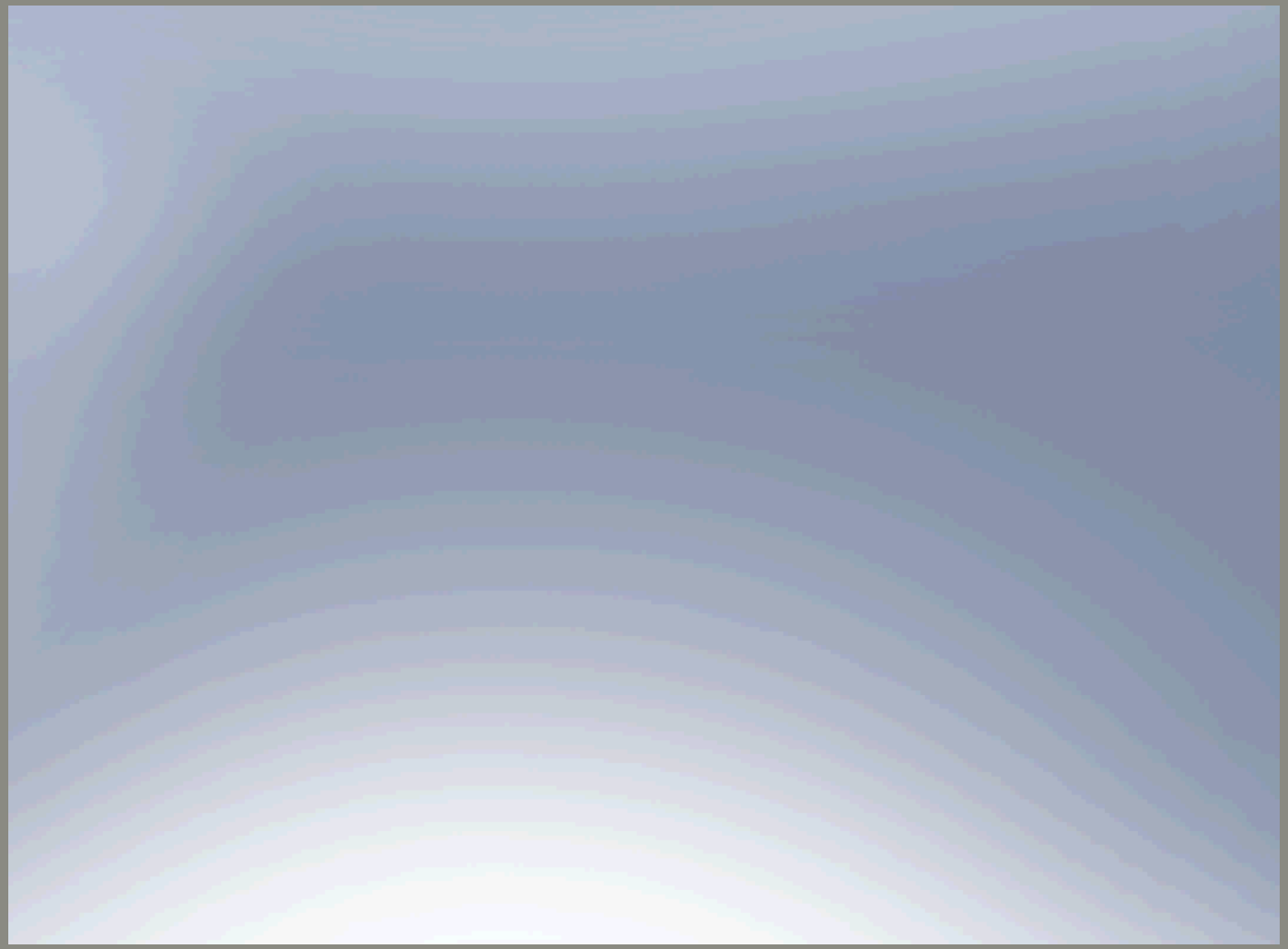
Electrical Engineered Drawings



Intuitive Designing

- Routing allows for designers to more easily capture true design intent
- Routing tools simplify process of adding and modifying complex cable and piping systems
- Allows designer to quickly explore many cable/pipe layouts

Piping Example



Questions

- What types of components can be designed using SolidWorks Routing Tools?
- Ans:

  Routing can be used to design and modify piping and electrical systems within simple and complex assemblies.

Question

- What features in routing make it useful to the design process?
- Ans:
  Several convenient features include:
  - extensive library of drag and drop components
  - auto-routing between points
  - drag and drop modification of route
  - quick interference checking and route optimization

- Questions or Comments?
- Additional routing videos available at:

  http://www.solidworks.com/pages/onlinetour/popup.cfm