Learn How to Optimize Heat Exchanger Designs using Aspen Shell & Tube Mechanical

A self guided demo to get started with Aspen Shell & Tube Mechanical

aspentech

Why Use Aspen Shell & Tube Mechanical?

Aspen Shell & Tube Mechanical optimizes the design of all mechanical components, and performs detailed code calculations, customized cost estimates, detailed drawing packages, and a complete bill of materials.

When used with Aspen Shell & Tube Exchanger, Aspen Shell & Tube Mechanical ensures consistency between thermal and mechanical designs. This enables engineers to both optimize and efficiently validate the thermal and mechanical designs of shell and tube heat exchangers.

When used as a standalone program in design mode, Aspen Shell & Tube Mechanical can optimize the design of a full shell and tube exchanger with minimal input calculating flanges, tube sheets, expansion joints, supports, shell, and nozzle reinforcement.

Why Use Aspen Shell & Tube Mechanical?

Obtain a detailed mechanical design of Aspen Shell & Tube Exchanger and be able to:

- Perform detailed code calculations for all components
- Obtain detailed drawing packages
- Get a complete bill of materials
- Get customize cost estimates - material & labor

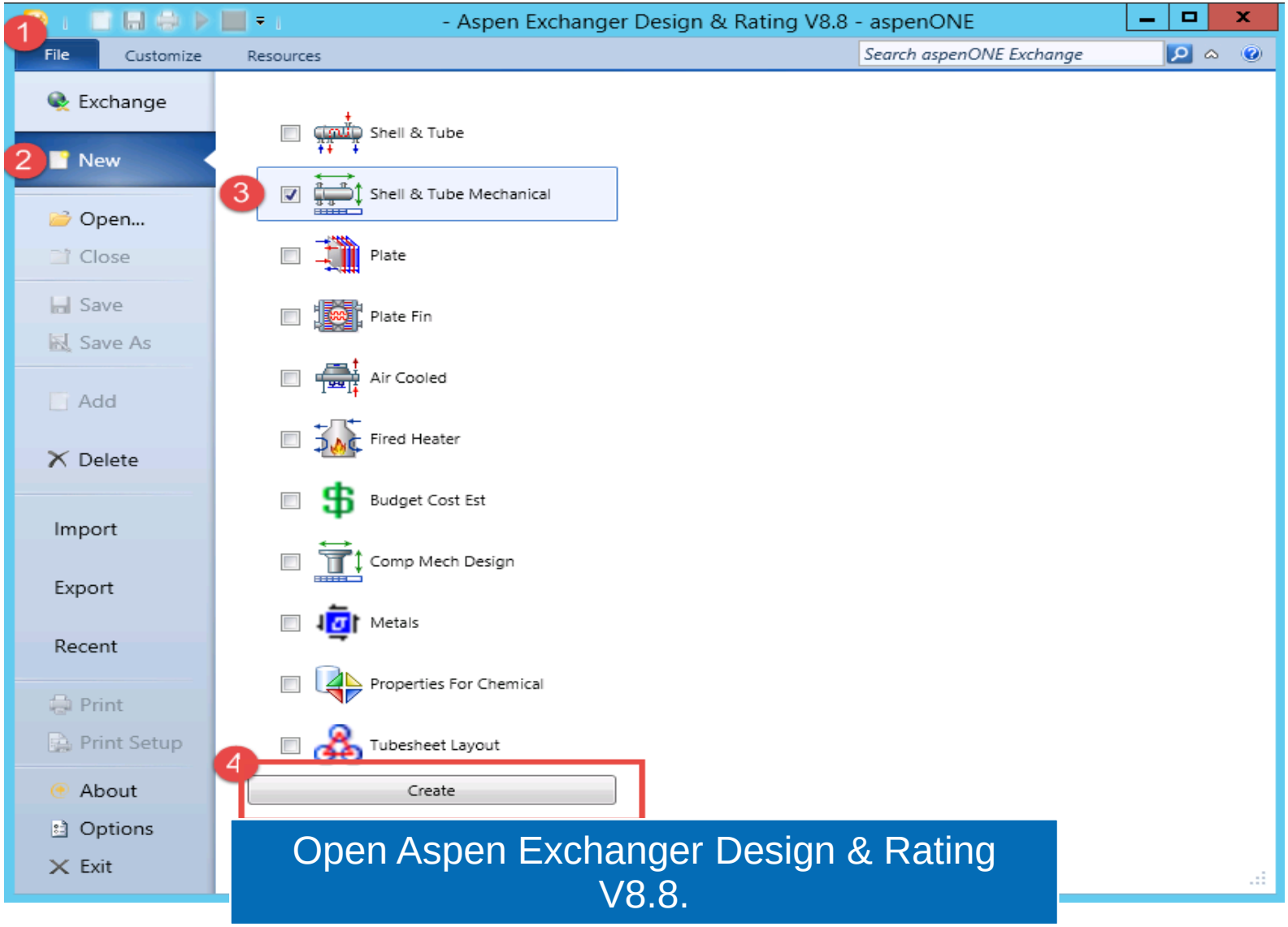
Objective

This document serves as a simple “getting started” guide, showing you the most common progression of how an equipment designer would use Aspen Shell & Tube Mechanical to generate an optimal heat exchanger design.

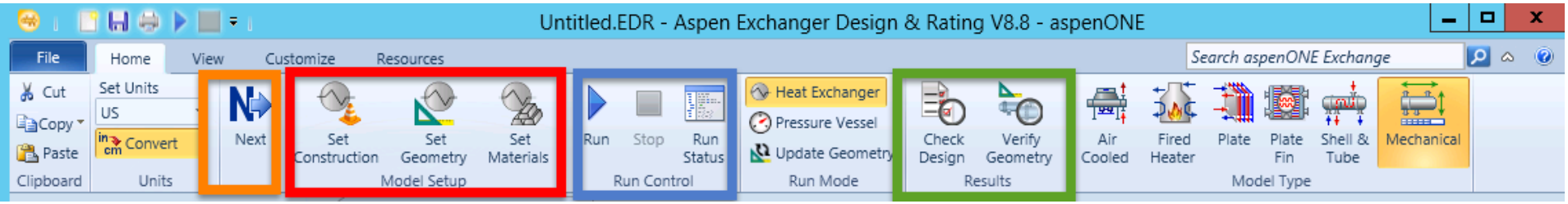
This guide demonstrates how to:

- Specify input data
- Run the program
- View key results
- Transfer results to other formats

Open Aspen Shell & Tube Mechanical



Home Ribbon Work Flow



‘HOME RIBBON” guides sequentially through the various stages of the heat exchanger design.

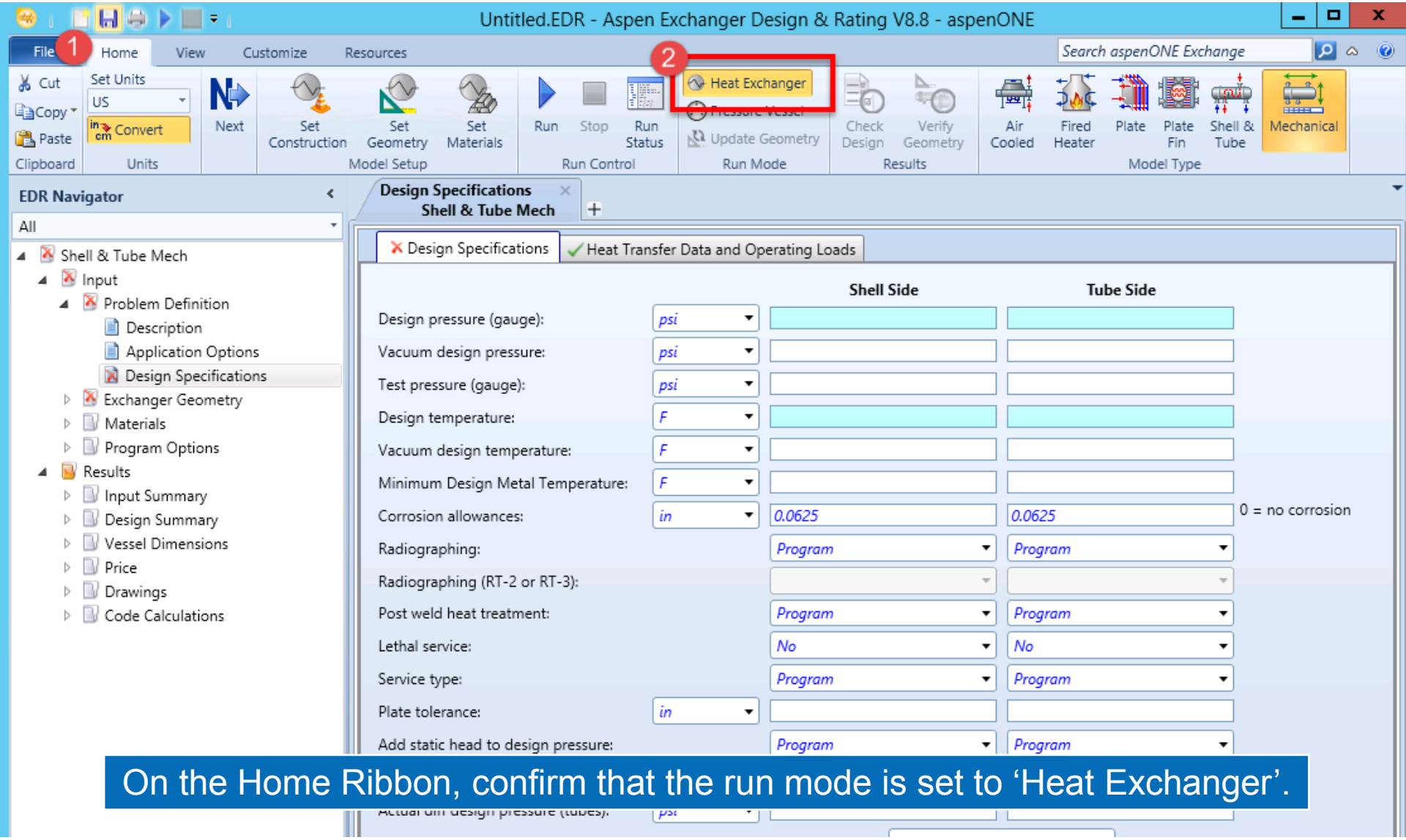
NEXT button takes us sequentially through the required input forms to complete the program inputs.

MODEL SETUP contains shortcuts to the main input forms.

RUN CONTROL contains key to run the design calculations.

RESULTS provides easy access to key results.

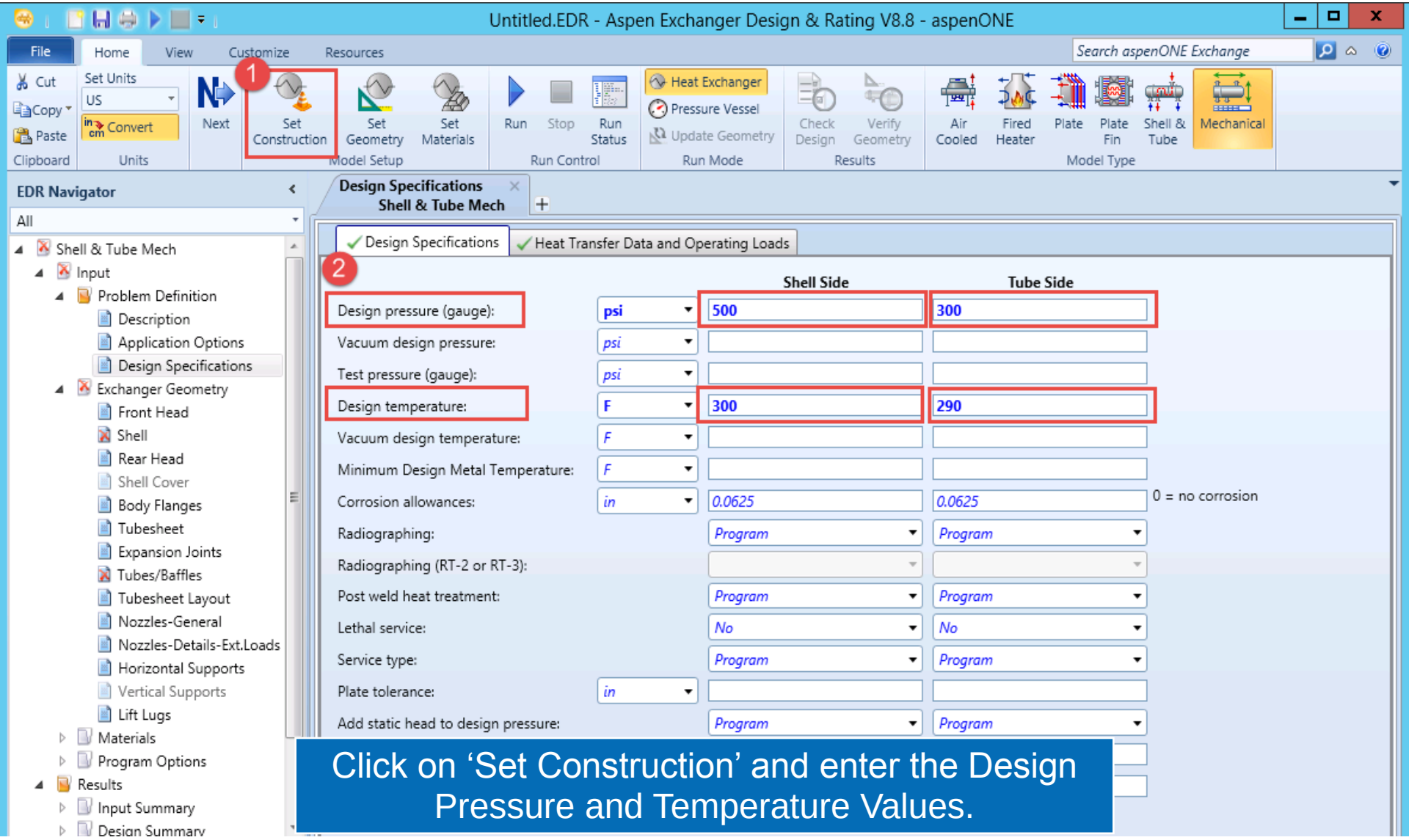
Set the Program for Heat Exchanger Design



On the Home Ribbon, confirm that the run mode is set to ‘Heat Exchanger’.

aspentech

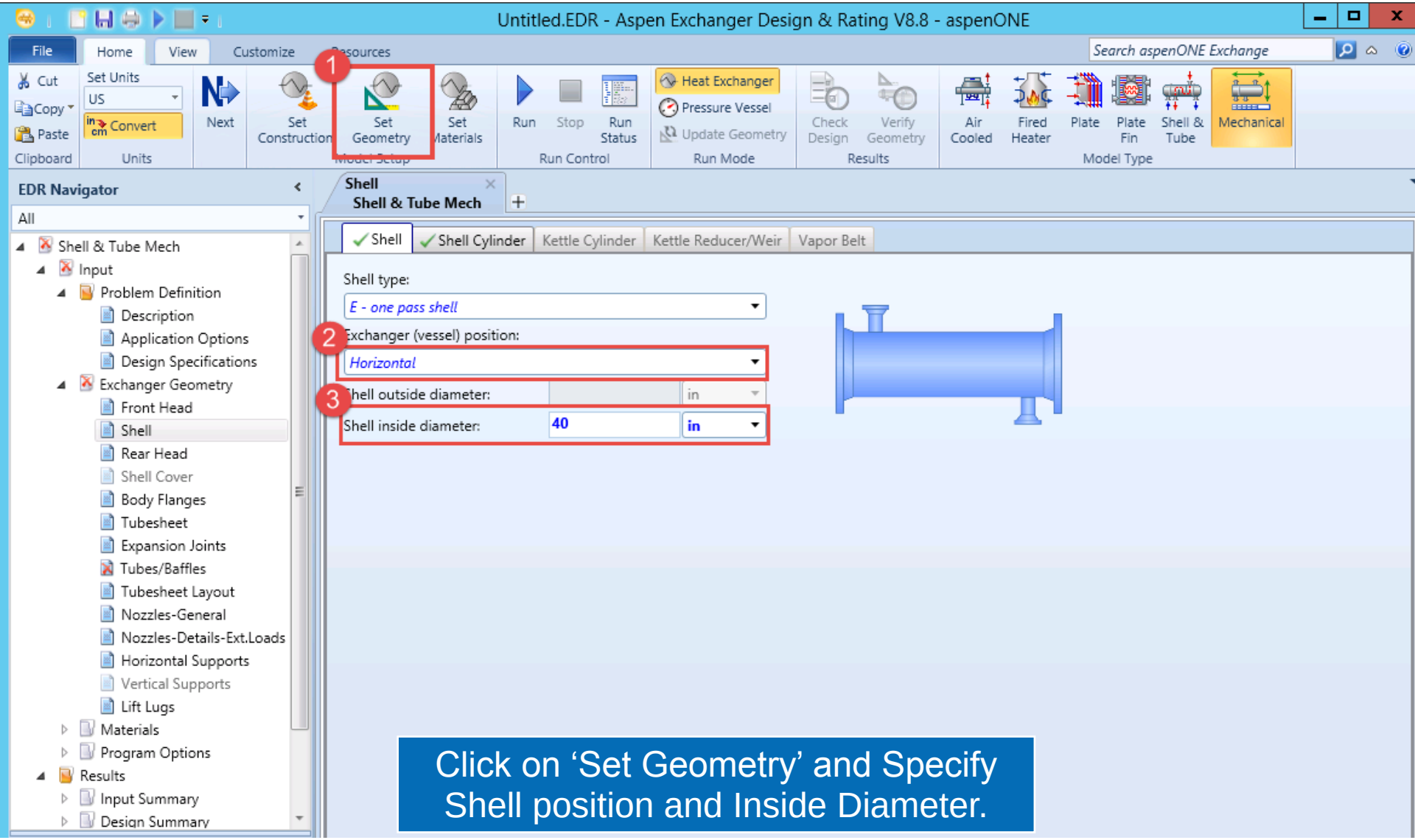
Specify the Design Temperature and Pressure



Click on ‘Set Construction’ and enter the Design Pressure and Temperature Values.

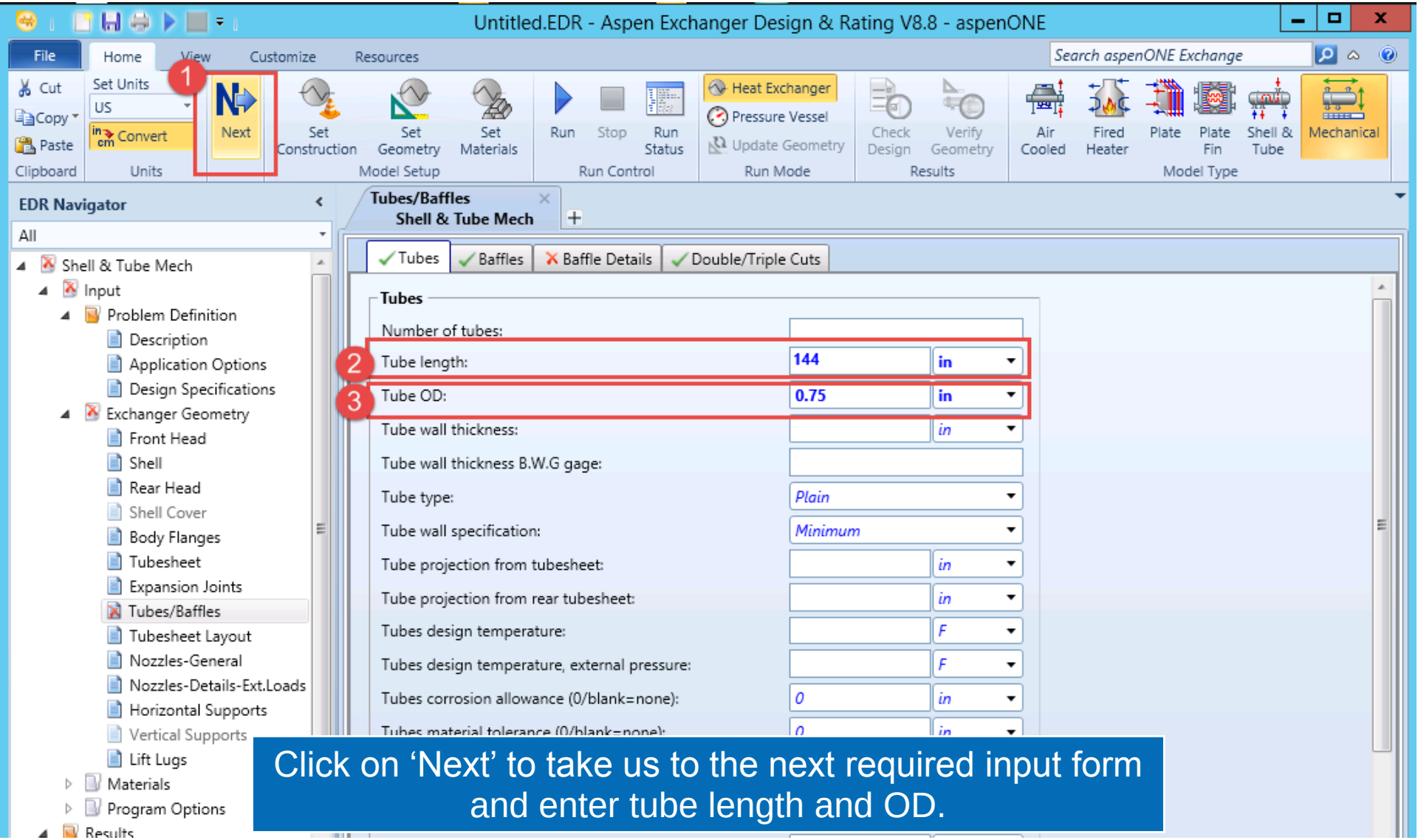
aspentech

Specify Shell Geometry



aspentech

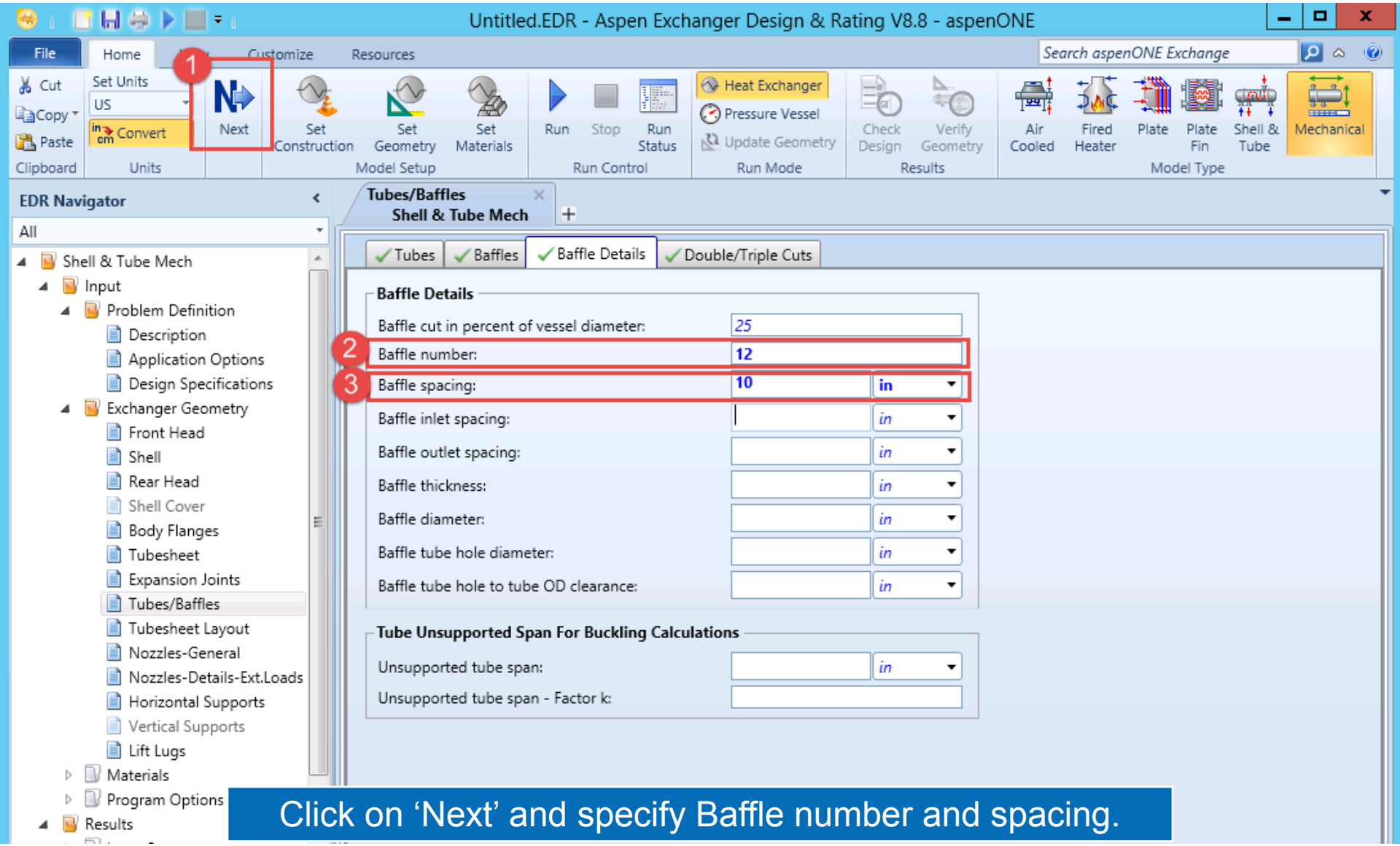
Specify Tube Geometry



Click on ‘Next’ to take us to the next required input form and enter tube length and OD.

aspentech

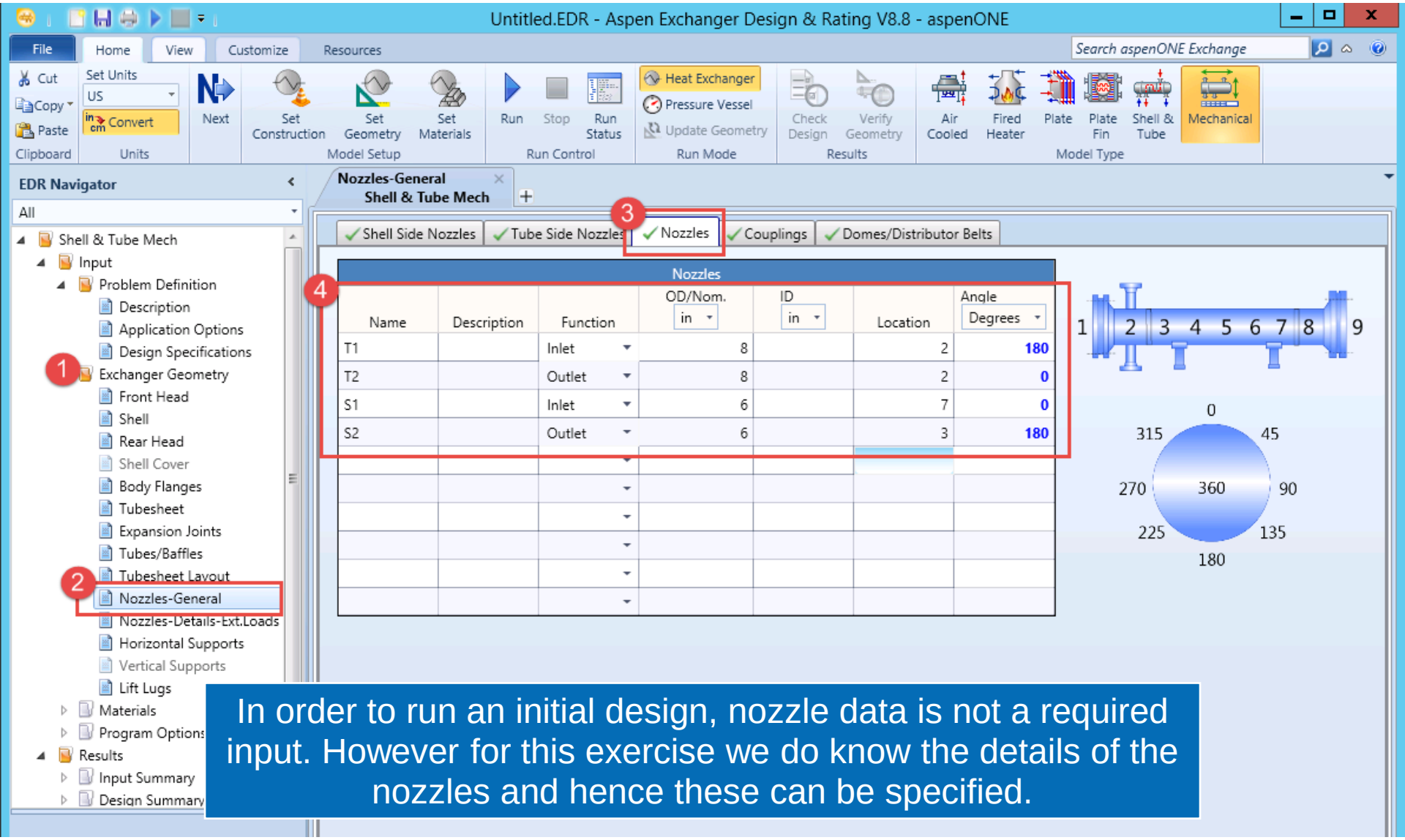
Specify Baffle Details



Click on ‘Next’ and specify Baffle number and spacing.

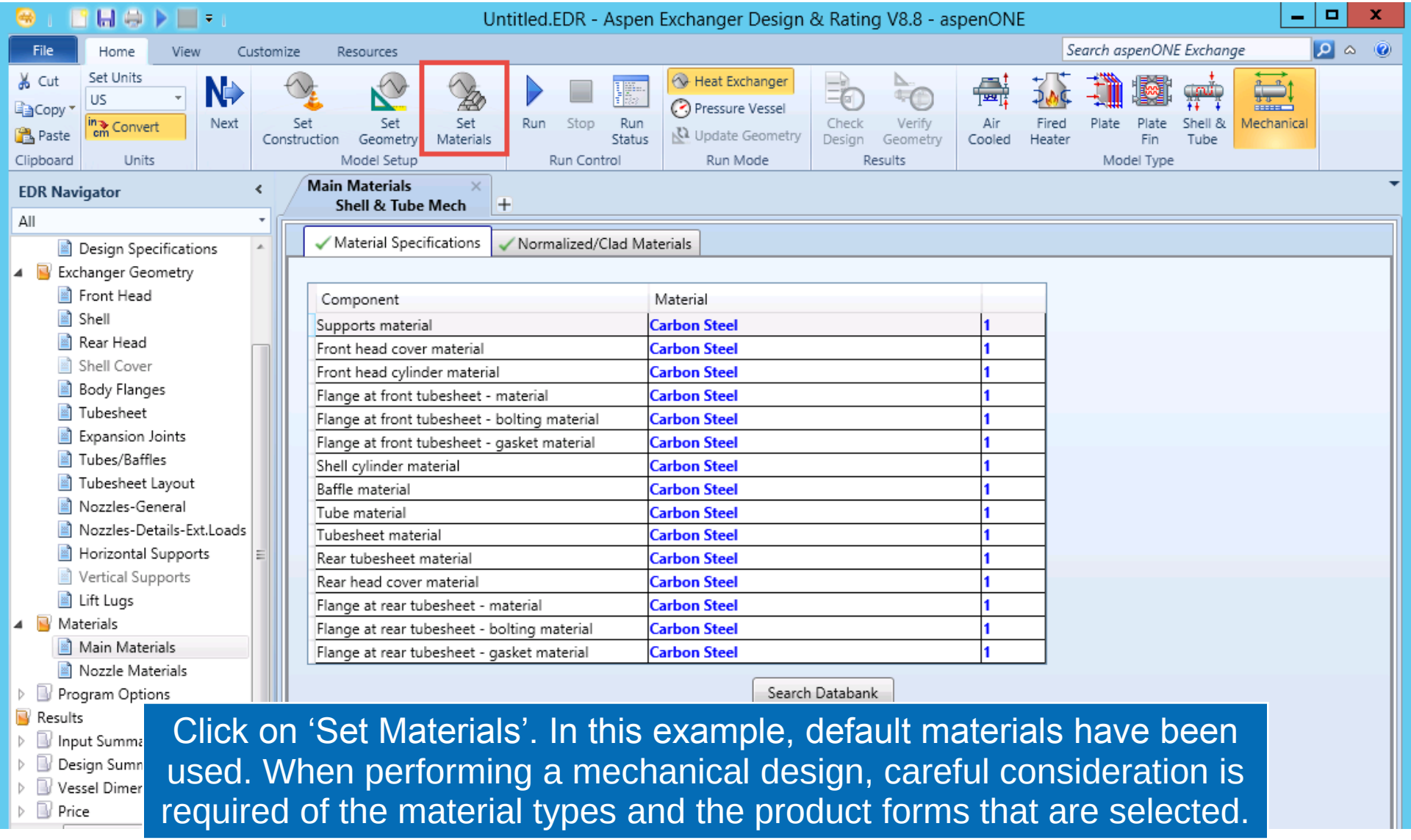
aspentech

Specify Nozzle Details



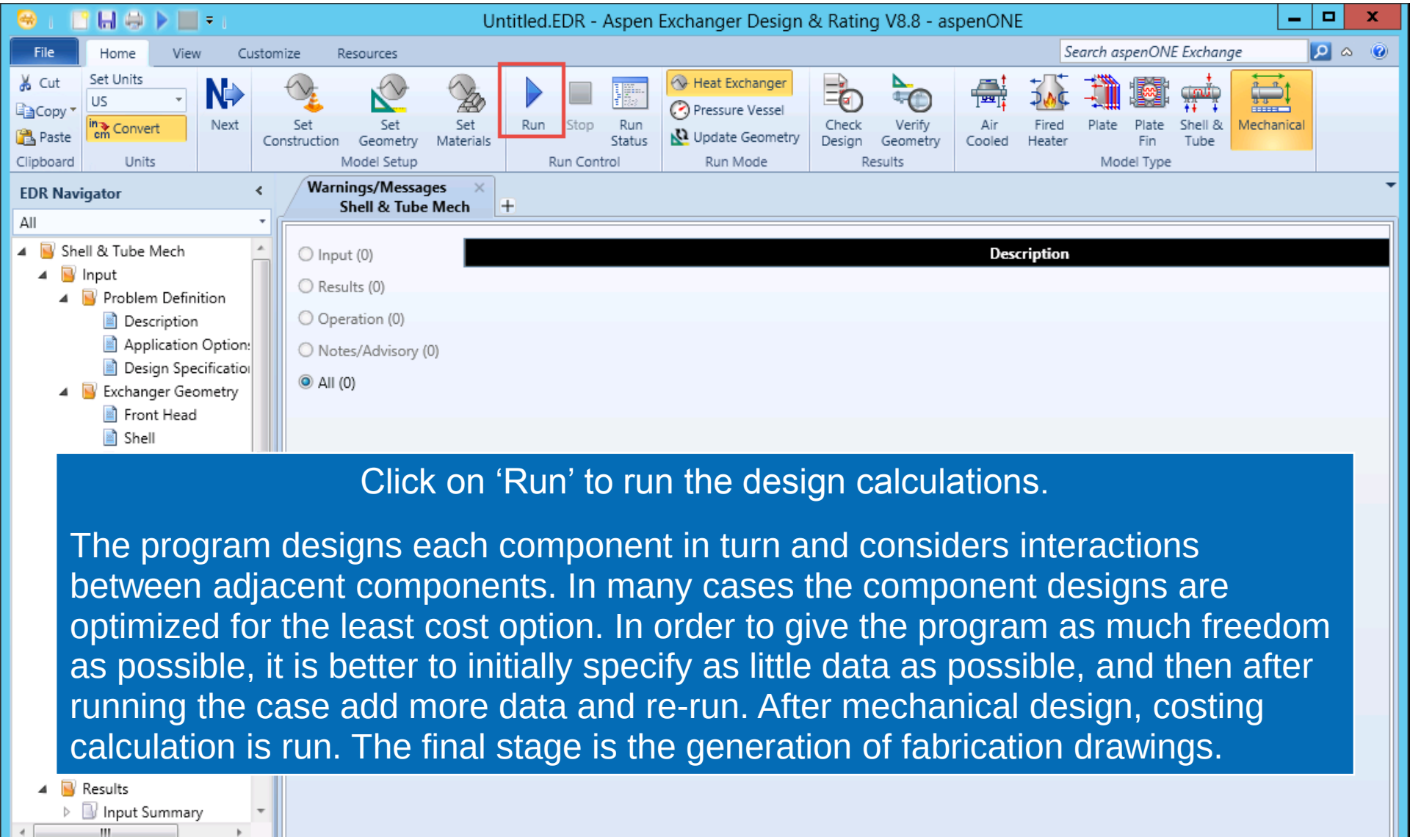
In order to run an initial design, nozzle data is not a required input. However for this exercise we do know the details of the nozzles and hence these can be specified.

Set Materials



Click on ‘Set Materials’. In this example, default materials have been used. When performing a mechanical design, careful consideration is required of the material types and the product forms that are selected.

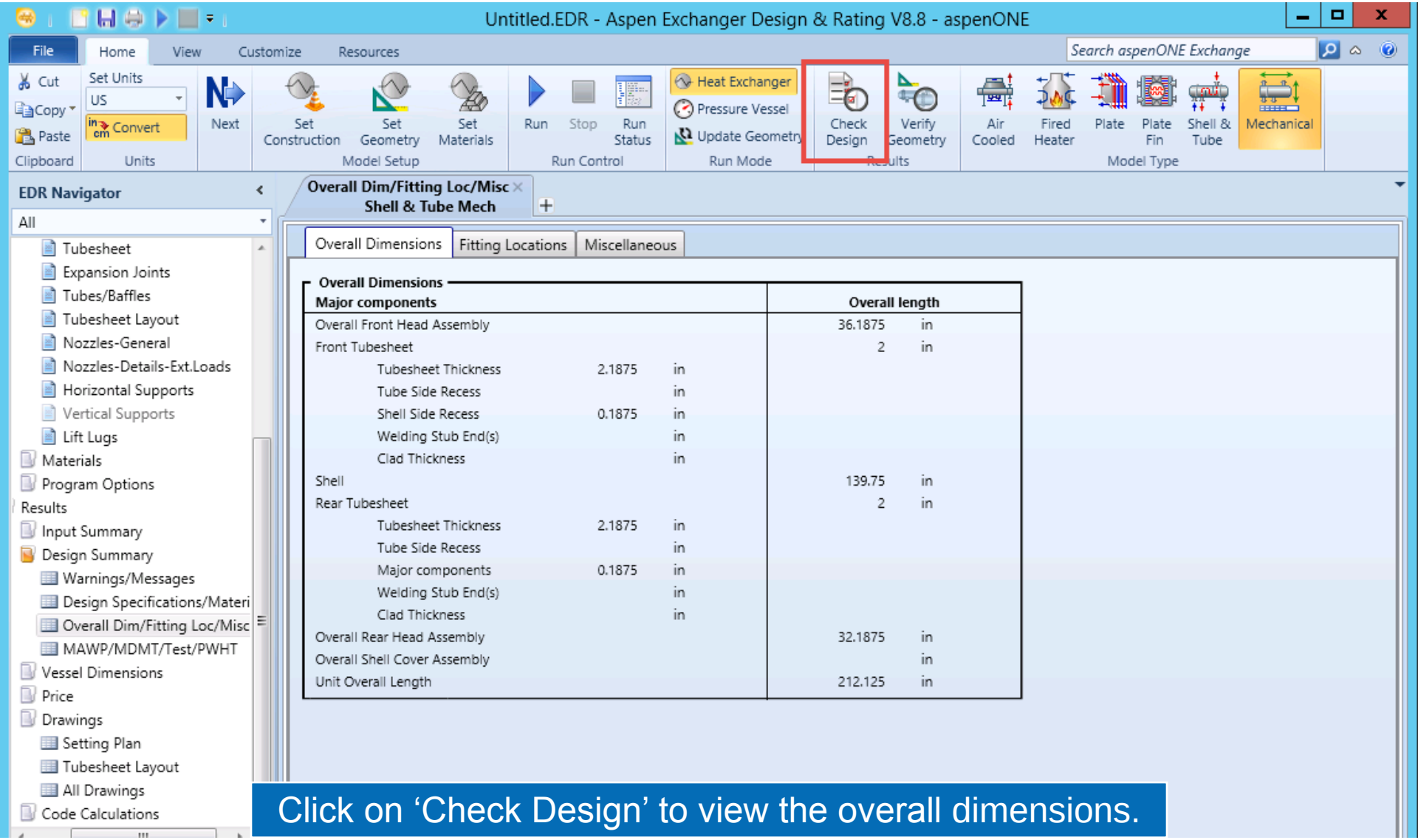
Run Design



Click on ‘Run’ to run the design calculations.

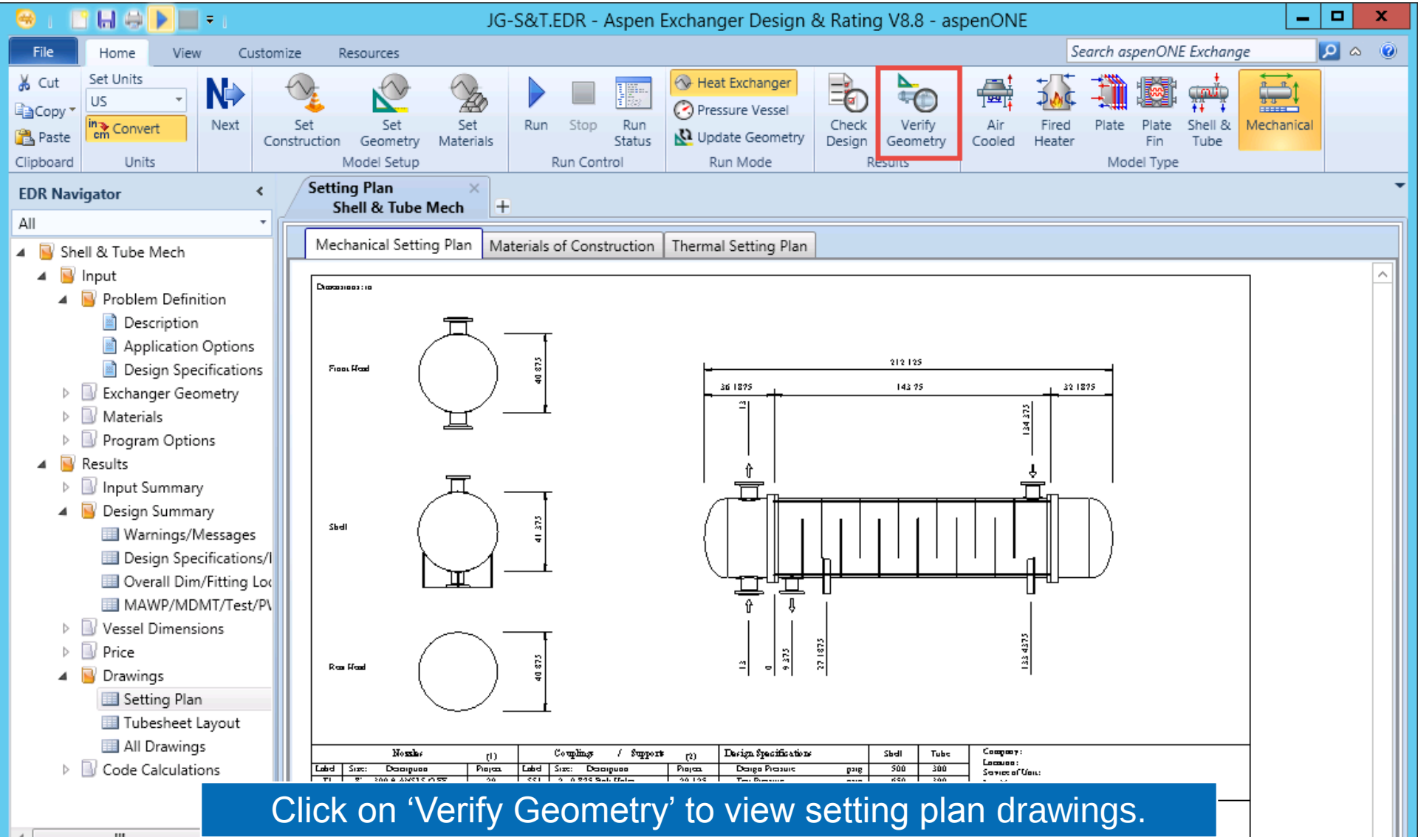
The program designs each component in turn and considers interactions between adjacent components. In many cases the component designs are optimized for the least cost option. In order to give the program as much freedom as possible, it is better to initially specify as little data as possible, and then after running the case add more data and re-run. After mechanical design, costing calculation is run. The final stage is the generation of fabrication drawings.

View Overall Dimensions



Click on ‘Check Design’ to view the overall dimensions.

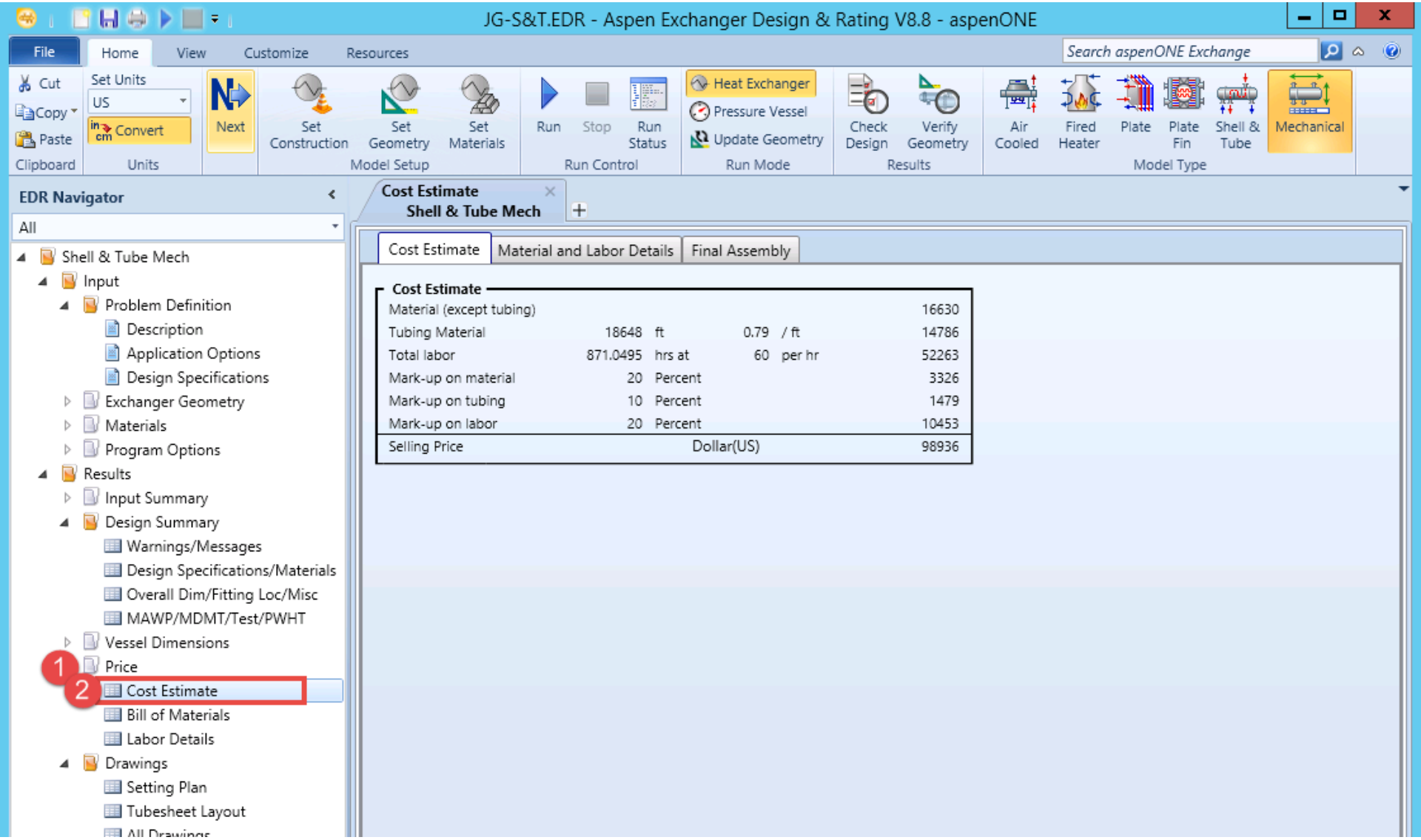
View Setting Plan



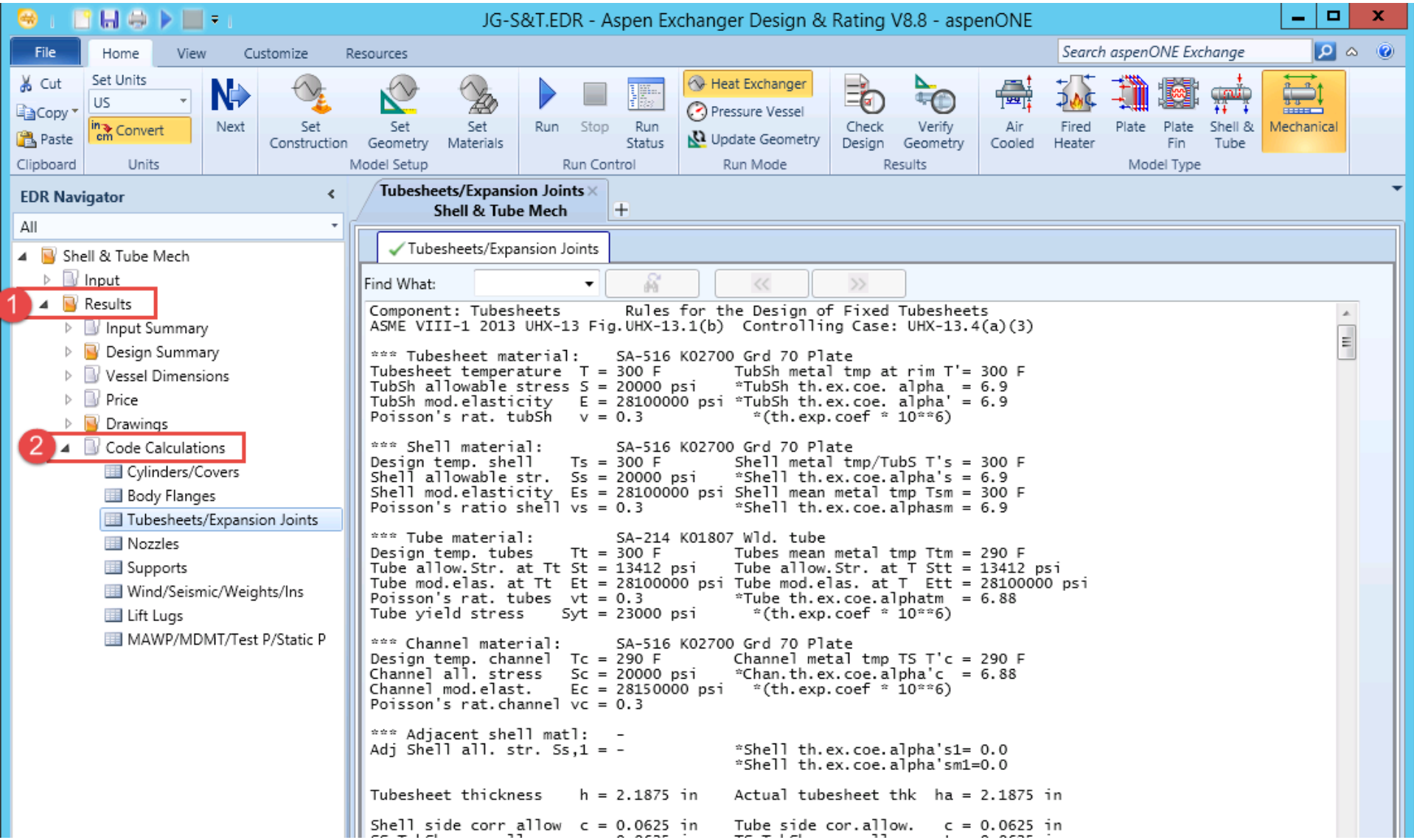
Click on ‘Verify Geometry’ to view setting plan drawings.

aspentech

View Cost Estimate



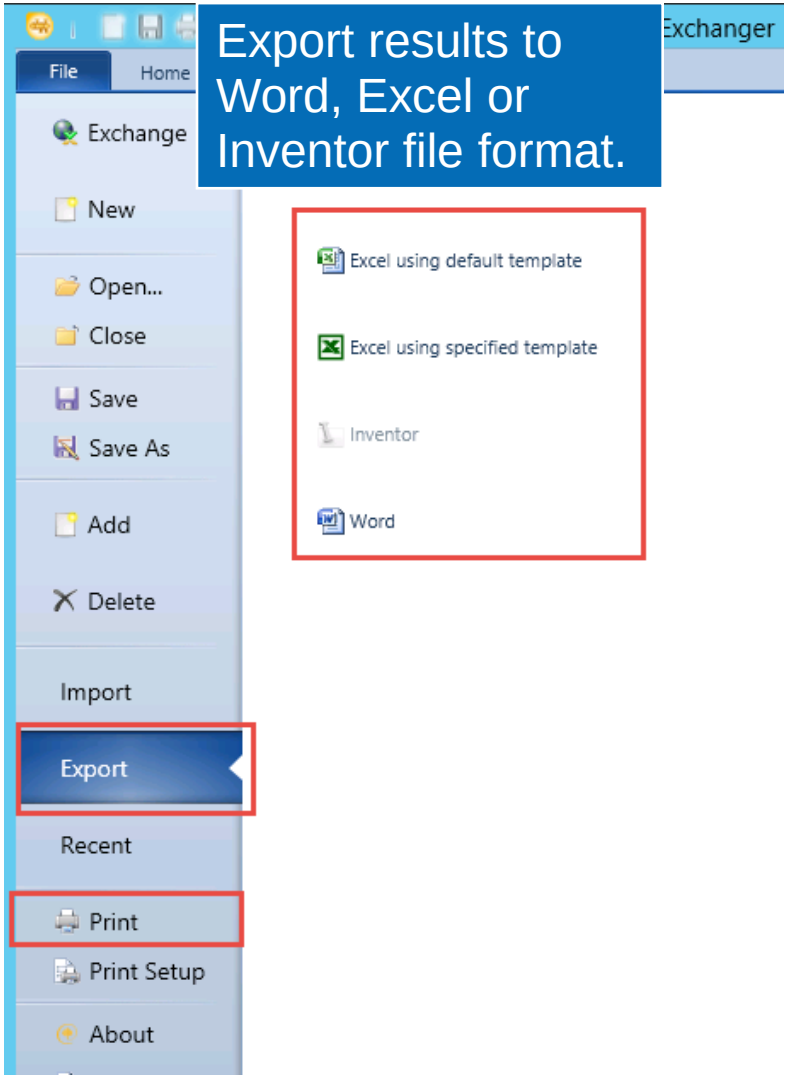
View Code Calculations



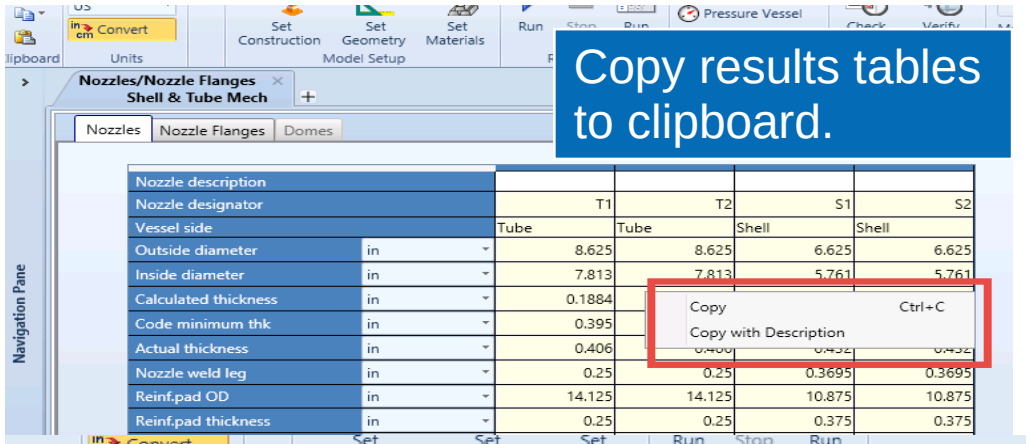
aspentech

Copy Results to Other Formats

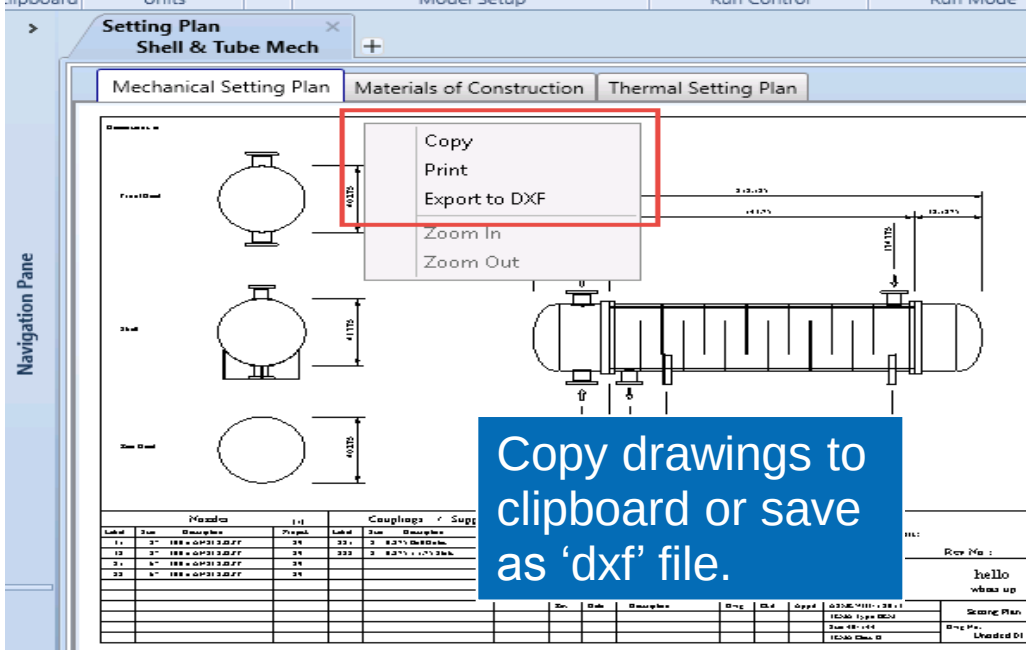
Export results to Word, Excel or Inventor file format.



Copy results tables to clipboard.



Copy drawings to clipboard or save as ‘dxf’ file.



aspentech

Additional Resources & Contacts

- AspenTech Support Website (http://support.aspentech.com)
- AspenTech Courseware Available in Classroom and Online Versions
- AspenTech Business Consultants

Contact Name	Contact Email
Sandeep Mohan	Sandeep.Mohan@aspentech.com