



TVVD1003
Visual Vessel Design

Course Agenda
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Day 1

Introduction to VVD Interface

Options and Process Data

Material Libraries

Visual vs. Normal Mode and individual component design

Design of a Semi-Elliptical Head in VVD ('Normal' Mode)

Horizontal Vessel with Multiple Nozzles to EN 13445-3

- Liquid Content input

- Weight Contingency

- Simple Vessel (Drum) modelling, including Heads

- External Pressure and unsupported lengths of shells

- Analysis and Results, including Component Utilization and Review

- Copying Components

- Nozzle Input, including Radial, Hillside & Tangential and Nozzle on Nozzle

- Sump/boot modelling, including adding nozzles to ends

- Groups of Nozzles/Openings calculation

- Stiffener Rings for External Pressure

- Support Saddles, including Integrated Rings

- Loads & Load Cases, including Live and Wind & Seismic Loads

- Lifting Lugs

Vertical tower with Platforms and Ladders to EN 13445-3

- Conical Sections

- Skirt Support, with openings, and Base (/ring...) analysis

- Editing Components, including multiple at once - Quick Design

- Nozzles/Openings continued, including Manways

- Nozzles with attached piping (drain)

- Multiple Nozzles in heads

- Flanges (on Pipe/Nozzles) and Analysis

- Domes (Instrument) on Nozzles

- Modelling Pipe/Pipe Bends

- Platforms and Ladders

- Loads & Load Cases continued

- Tall Tower Analysis

Day 2

Comparison of code criteria EU EN 13445, US ASME VIII Div. 1 and UK PD 5500

- Allowable stress

- Joint Factors

- Design of cylindrical shells

- Design of heads

- Nozzle (reinforcement) Calculations

- Differences and similarities between ASME VIII Div. 1 and Div. 2

- Nozzle reinforcement interference

Vertical tower to ASME VIII Div. 1

- Cone to cylindrical shell Junction Rings (Stiffener Ring at Transition)
- Nozzle/Nozzle Flange - Mating Input
- Pipe/Bend modelling continued
- User-specified Components, including Trays, Packing and Insulation
- Loads & Load Cases, including Wind & Seismic Loads
- Lifting (Tailing) Lug analysis, including Horizontal to Vertical rotational lift

Convert an existing EN 13445 design to ASME VIII Div. 1

- File Templates
- New Design Code
- Importing Materials from another vessel design file
- Change Component and Nozzle, etc., Materials
- Analyze & Review results and edit vessel to pass

Analysis of external loads on Nozzles and Lifting Trunnion analysis

Fatigue analysis

Legs, Lugs and Half Pipe Jacket

Other models;

Jacketed Vessel

Rectangular Vessel

(ASME VIII) Div. 1 App. 14 Large Opening and (Welded) Flat End calculations

EN 13445 Standalone Nozzle Calculation

Day 3

Heat exchanger with fixed tubesheet to EN 13445-3, Sect. 13.5

Technical discussion

Fixed tubesheet exchanger modelling and analysis

Body Flange input and analysis

Tube Layout and Bundle design

Expansion Bellows / Joint

(Alternative Tubesheet design method to EN 13445-3, Annex J, is available)

Heat exchanger with submerged floating head to EN 13445-3, Sect. 13.6

Floating Head / Bolted Dome End design

Heat exchanger with U-tube bundle to EN 13445-3, Sect. 13.4

Limit Analysis and external loads on nozzles discussion