

Advanced Pressure Vessel

Your Fast, Accurate, and Reliable Design Solution



General Features

- ◆ Calculations in English or Metric Units
- ◆ Calculations are performed in strict accordance with the ASME® Section VIII Div. 1 Code or other published and accepted engineering standards
- ◆ Solve for either pressure or thickness, depending on your specific need
- ◆ User interface conforms to common Windows based applications
 - * Tree structure on the left column lists all components
 - * Left-click on a component to add an attachment or other component
 - * Common Windows key short-cuts are used
- ◆ Analysis for either a single component or an entire vessel
- ◆ 3D graphical representation of your design that can be rotated through all 3 axis, scaled, re-oriented, made transparent, or even viewed from inside the design
- ◆ “Summary Window”
 - * Shows a quick overview of the current design or highlighted component
 - * Displays geometry, pressure, or component specific information
 - * If you own a support module, support type, wind code, and seismic code are also displayed
- ◆ Materials database covering thousands of base metals (**User Customizable**)
 - * Section II Part D materials including stress values and yield strengths in relation to your design temperature, B Factor curves included
 - * Pipe table covering 1/2 “ to 36” (**A.P.V.** can automatically select a pipe schedule that meets the minimum design requirement)
 - * Fittings - including long weld neck flanges and couplings
 - * Gaskets, Flanges (including ANSI® pressure & temperature ratings of 150 - 2500lbs)

Head Design

- ◆ Calculations are performed using the ID or OD for Flanged and Dished, Braced and Stayed, Torispherical, Ellipsoidal, Hemispherical, Conical, Flat, & Toriconical heads

Shell & Cone Design

- ◆ Calculations for multiple shell segments with varying diameters (ID or OD)
- ◆ UCS-79 (Extreme Fiber Elongation)
- ◆ Calculations for conical reducing sections
- ◆ Calculations for cone to cylinder junction reinforcement

Stiffening Rings

- ◆ Calculations for numerous styles of stiffening rings
- ◆ Maximum distance between stiffeners calculated

Nozzle Design

- ◆ Calculations
 - * Nozzle reinforcement & minimum reinforcing pad size
 - * Nozzle weld load, stress, strength of connection, shear, and path of failure
 - * Large openings in accordance with Appendix 1-7
 - * Minimum Nozzle thickness in accordance with UG-45
- ◆ Loadings
 - * Localized stresses or maximum loadings calculated in accordance with WRC-107
- ◆ FEA
 - * Direct output provided for analysis via **Nozzle/Pro** (not included) from **Paulin Research Group**

Jacket Closure Design

- ◆ Calculations performed in accordance with Appendix 9 and include minimum jacket and/or closure member thickness as well as weld size for Heads, Shells, & Cones

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Studded Outlets

- ◆ Calculations include Area of reinforcement, MDMT, MAWP, External or Internal pressure, & Internal corrosion allowance.

Clamp Design

- ◆ Calculations for clamps & hubs performed in accordance with Appendix 24
- ◆ Includes bolt loads, hub moments and stresses, clamp stresses,
- ◆ Allowable design stresses for both operating & assembly conditions

Flange Design

- ◆ Custom flange calculations performed in accordance with Appendix 2 and the Taylor Forge method for minimum thickness, MAWP, and weld sizes
- ◆ Design flanges utilizing a full face gasket, reverse flanges, lap joint flanges, blind flanges, ASME rated flanges (per ASME® B 16.5 & B 16.47)

Lifting Lug Design

- ◆ Calculations for both Horizontal and Vertical Lifting Lugs are performed per accepted standard engineering methods for single lugs or pairs connecting to the vessel shell.

External Pressure *(Vacuum)*

- ◆ External pressure & minimum thickness for shells, heads, and nozzles
- ◆ Factor A is calculated (eliminates the need to use the Factor A chart)
- ◆ Factor B is calculated using the curves from Section II Part D

MDMT *(Minimum Design Metal Temperature)*

- ◆ Calculations performed per UCS-66 give a report summarizing the MDMT for all pressure components composed of UCS-23 materials

Blueprinting

- ◆ 2D blueprint view shows shells, heads, cones, nozzles, nozzle flanges, bill of materials, and a detailed nozzle schedule
- ◆ Can be viewed on screen, output to a printer or plotter, and exported in DXF format for use with a CAD program

Reports

- ◆ A.P.V. has the most clear, concise, well thought out reports in the industry
- ◆ Calculations are shown in their original algebraic format
- ◆ Reports include the appropriate Code formulas with the proper design values inserted and results *(great for inspectors, customers, & QC/QA personnel)*
- ◆ Many formal reports for components such as nozzles
- ◆ Report sections can be re-ordered and added or removed from the report as needed *(i.e. reviewing the nozzle report)*
- ◆ Reports may be printed, viewed on screen, or saved as a PDF *(for email, electronic storage, use on an intranet, etc.)*

Available Modules *(May be purchased as needed or in a discounted bundle)*

- ◆ **Advanced Tower Design** - Tall tower analysis, skirts, and base rings
- ◆ **Legs, Lugs, & Seismic** - Legs, support lugs, and support rings
- ◆ **Zick, Saddles, & Seismic** - Saddle supports for horizontal vessels
- ◆ **Pressure Vessel Suite** - A bundle of *Advanced Pressure Vessel* with the above three modules at a generous savings
- ◆ **Heat Exchanger** - Heat exchanger design made easy, in accordance with the current mandatory Part UHX
- ◆ **Pressure Vessel Suite Plus** - A bundle of Pressure Vessel Suite along with our HE Module

Further detailed information is available in the separate Module Brochures

Easy to Use

Advanced Pressure Vessel has a comparatively short learning curve. With the contextual help system and in-depth manual you'll be designing in no time.

Well Supported

Our friendly tech support and engineering staff can be reached by phone, fax, or email.

Competent results

The program's output will offer a level of professionalism your customers will come to both depend on and appreciate.

A Quality Product

Our rigorous quality control protocols ensure accurate, least cost, worry free designs.

Longevity & Trust

Advanced Pressure Vessel has been around for over 22 years, and is the solution of choice for large Fortune 500 corporations, government agencies, fabrication shops, consulting engineers, top authorized inspection agencies, and many small businesses.

Save Time & Money

The graph to the right shows the time taken to design a heat exchanger using **Advanced Pressure Vessel** & our **Heat Exchanger Module**, pre-designed Spreadsheets, and by hand with a good calculator. As you can see there is a large time savings between just our software and the spreadsheets (*which took over 80 hours to set up in the first place*).

So, how much is your time worth?

This data was submitted to CEI by a customer who is a consulting engineer and a Code committee member.

Minimum PC Requirements

500MHz CPU (P4 2GHz recommended), 256MB RAM (2GB Recommended), 100MB free HD space, running Windows XP, Vista, or 7 with Regional options set to "English", 1 open USB Port, and email access.

