

What's New in PV Elite and CodeCalc 2020

The latest PV Elite and CodeCalc releases deliver a number of significant new and extended capabilities in response to current market requirements, as well as direct feedback from the growing PV Elite and CodeCalc user community. The following changes have been made to PV Elite and CodeCalc.

PV Elite and CodeCalc 2020 (Version 22.0)

Code Updates

- Updated to support Chinese wind code GB 50009 to 2012 edition
- Updated to support new rules for Nozzles close to Tubesheets (CR-TX-29751)
- Updated to display the acceptable edition for ASME B16.5/16.47 (CR-TX-29754)
- Updated to display series dropdown option in the Flange and Nozzle dialog (CR-TX-30213, CR-TX-30013)
- Updated to implement the ASME VIII, Division 2: 2019 Edition code updates that relate to Paragraph 8.1.3.1 - Hydrotest and Pneumatic Stress Limit Requirements (CR-TX-30032)
- Updated to implement the ASME VIII, Division 2: 2019 Edition code update, where the value of σ_3 has been set to zero as the radial stress at the outside surface is zero. (CR-TX-30030)
- Updated the ASME material database to separate the min and max thicknesses. (CR-TX-24834)
- Updated to support ASME PCC-1 Appendix O, Assembly Bolt Stress Determination and WRC 538 Determination of Press. Boundary Joint Assembly Bolt Loads (CR-TX-32209, CR-TX-22253)
- Updated to implement code update for the UG-20(f) exemption in flanges produced to fine grain practice and revision to UCS 66 to account for removal of using the stress ratio for ANSI flanges. (CR-TX 29970)

Configuration

- Updated PV Elite to allow the option to separate the Internal, external and pressure test output reports by element. (CR-TX-29744)
- Updated PV Elite to replace Code Case 2695 description with Appendix 46 in the Configuration dialog and the report titles in the output. (CR-TX-29898)
- Updated PV Elite to add the 2017 edition year to the Material Database Selection dropdown list in the Configuration dialog. (CR-TX-32122)

Input Processor and Analysis

- Updated PV Elite to replace the bitmap with appropriate image according to vessel orientation in the Platform Detail Dialog. The bitmap image changes according to the vessel orientation. (CR-TX-29045)
- Updated PV Elite to add an icon button to direct the user to the Angle Direction and Orientation configuration window. (CR-TX-29046)
- Updated PV Elite to adjust the area calculation based on user comments and set the Cf value set to 2.0 by default, so that the areas are calculated in the platform dialog. (CR-TX-28469)
- Updated PV Elite to add a checkbox to not de-rate the ANSI flange MAWP if the user is using Code Case 2901. (CR-TX-28781)

- Updated the PD 5500 material database file as required from internal requirements. (CR-TX-29074)
- Updated PV Elite to implement Fluid Topics, so that our users can enjoy the benefits of this delivery system for documentation. (CR-TX-29083)
- Updated CodeCalc to implement Fluid Topics, so that our users can enjoy the benefits of this delivery system for documentation. (CR-TX-29085)
- Updated PV Elite to add an edit button to the Title Page dialog box, so that users can easily open the title page text file to edit the contents without having to search for the text file in the system folder. (CR-TX-29228)
- Updated PV Elite to remove the Title Page report if it's blank, so that users do not get a blank page when they print the reports. If Title page report is blank, it should not be seen in the Output Application report list. (CR-TX-29229)
- Updated PV Elite to set the reports order that appear on the Report List in the Output Processor application, so that users can always get the same default order they choose to set. (CR-TX-29230)
- Updated PV Elite to view the list dialog column headers as unique names, so that there is no confusion about what header belongs to what section (ie material - nozzle or pad or flange?). (CR-TX-29348)
- Updated PV Elite to avoid the bolt circumferential spacing calculations in the Flange Dialog and in the report if the "Is this a Standard Flange" box is selected and a gasket is selected. (CR-TX-30162)
- Updated PV Elite to implement the ASME VIII 2019 Edition code updates that relate to UG-44, Table UG-44 (Div 1) and Paragraph 4.16.12, Table 4.16.12 external loads on weld neck flanges, so that PV Elite can accurately analyze a pressure vessel with the standard-sanctioned values. (CR-TX-30012)
- Updated PV Elite to implement the ASME VIII, Division 1: 2019 Edition code update that relates to the updates to UG-36(g). When the included angle exceeds 30 degrees, the Nozzle Calc report removed the nozzle warning message for cone > 30.0 degrees. (CR-TX-29904)
- Updated PV Elite to implement the ASME VIII 2019 Edition code update that relates to the updates to Allowable Tube-to-Tubesheet Joint Loads types available. The software now allows internal pressures to be entered when 'f', 'g' & 'h' joint types are selected. (CR-TX-29883)
- Updated PV Elite to implement the ASME VIII 2019 Edition code update that relates to the interfacial pressures Pt and Po per Appendix A and Annex 4-C. The software calculation now includes the new added formulas for interfacial pressures Po and Pt to Appendix A (VIII-1) and Annex 4-C (VIII-2). (CR-TX-29944)
- Updated PV Elite to implement the latest ASME B16.5 B16.5-2017 update which added the 22 inch pipe standard dimensions. (CR-TX-29755)
- Updated PV Elite to implement the ASME VIII, Division 2: 2019 Edition code updates that relate to Paragraph 4.4 and External Pressure Rules and Fic Calculations, so that PV Elite can accurately analyze a pressure vessel with the standard-sanctioned values. (CR-TX-30069)
- Updated PV Elite to enhance the placement of nozzles for hillside nozzles, so that it uses the XY coordinate system like the rest of the element details. (CR-TX-29855)
- Updated PV Elite to shown as say DN 100 instead of 101.6mm (actual diameter) for NPS 4 size in Half Pipe Jacket analysis. (CR-TX-30379)
- Updated PV Elite to Allow for bending allowable to be $1.33 \times \text{ASME Factor B}$ as per Dennis Moss by adding an input field for "Compression Allowable Increase Factor" in the Installation and Misc. Option dialog. (CR-TX-30834)

- Updated PV Elite to include a field to enter the weight of the lug support in the Support Lug dialog, so that users can account for the weight if user-defined. (CR-TX-1465)
- Updated PV Elite to add a reinforcing pad for a “Gusseted geometry with continuous top encirclement ring” support lug. (CR-TX-30943)
- Updated PV Elite to include design and analysis of Trunnions similar to CodeCalc. (RI-TX-18372)
- Updated PV Elite to include design and analysis of Perpendicular Lifting Lugs for Vertical Vessels. (RI-TX-23920)
- Updated PV Elite to perform a specific field test pressure calculation and other for shop testing through an option in the Design Constraints tab. (CR-TX-31005)
- Updated PV Elite to allow the use to provide the number of wetted tubes, or for PV Elite to compute the net volume by proportioning the number of wetted tube by a factor base on the partial volume divided by the full volume. (CR-TX-30911)
- Updated PV Elite to include metallic cladding or overlay material checkbox to label in the output regardless of the density of lining set. (CR-TX-31118)
- Updated PV Elite to add an option to include the Least Stress Ratio (LSR) for a standard flange to be included in the hydrotest. (CR-TX-31092)
- Updated PV Elite to allow the bolt circle diameter to be entered for single bolt leg baseplates since currently PV Elite uses the vessel OD. (CR-TX-31028)
- Updated PV Elite to display baffles in a heat exchanger model, so the application will be able to calculate the weight and CG, and also include the baffles in the 3D drawing. (CR-TX-31042)
- Updated CodeCalc to implement the ASME VIII 2019 Edition code update that relates to the interfacial pressures P_t and P_o per Appendix A. The software calculation now includes the new added formulas for interfacial pressures P_o and P_t to Appendix A (VIII-1). (CR-TX-31874)
- Updated PV Elite to define a shipping load case calculation for a vessel that will transported on saddles, so that users can obtain all saddles loads in the same model. PV Elite will utilize the G loading capability for applying shipping loads in the same model. (CR-TX-31759)
- Updated PV Elite to see the maximum theoretical test pressure in the Output report, so that I can show a higher theoretical test pressure. PV Elite will show this result by checking this option in the Design Constraints Palette. (CR-TX-32123)
- Updated PV Elite to allows users to use pre-defined less conservative F_m values based on the original PVP paper from 2013. The FM values reside in a text file in the system folder. (CR-TX-32133)

Export & Third-Party Integrations

- No changes.

Output Processor & Reports

- Updated the foundation 3D interface file as required for the latest version of the Foundation 3D program so that they work together properly. (CR-TX-28939)
- Updated the **ASME TX Calc** report to provide a note in output tubesheet report explaining why load case 4 is not being calculated where $(P_s - P_t)$ term would yield a 0 value result. (CR-TX-29679)
- Updated the **ASME TX Calc** report to address design of the Electric Heater Support Plate when internal vacuum is the principal design pressure. PV Elite was already doing this

within the calculation and now it is reflected in the formula and substitution line in the report. (CR-TX-29899)

- Updated the **Nozzle Summary** report to address the changes made the ASME VIII, Division 1: 2019 Edition code update that relates to flat heads, so that PV Elite can accurately analyze a flat head with additional geometries and correct dimensions (d, U3 and U5). (CR-TX-29952)
- Updated the **ASME TX Calc** report to address Divisions 1 and 2; UHX and 4.18: Tubesheet, Allowable Shear Stress update, where the allowable shear for all Tubesheet types in both divisions changes from 0.8S to min (0.8S, 0.533Sy). (CR-TX-29905)
- Updated the **Flg Calc [Int P]** report to address the revised Appendix 2 (VIII-1) and 4.16 (VIII-2) to state that flange rigidity rules are not required for split loose flanges. (CR-TX-29981)
- Updated the **Horizontal Vessel Analysis (Ope)** report to add some cosmetic additions to the analysis for horizontal saddle, so that users can get more pertinent information. (CR-TX-29998)
- Updated the **Vessel Summary** report to show if the shell or nozzle stresses governed when WRC 297 was used to determine the local stresses. (CR-TX-30723)
- Updated the **Nozzle Calc** report to warn users of the minimum distances between nozzles and gross structural discontinuities per Division 2 paragraph 4.15.13.1. (CR-TX-30007)
- Updated the **Conical Section** report to display how axial force and moment on small and large end were computed. (CR-TX-30843)
- Updated the **Basering Calculations** report to provide calculations for both wind and earthquake case, so that the user can see how the maximum bolt load for basering analysis was concluded. (CR-TX-30330)
- Updated the center of gravity calculation of vessel heads with a more accurate result calculation. (CR-TX-31098)
- Updated the **Earthquake Load Calculation** report, added a new column for vertical seismic load for each element (specially the load in the operating condition). (CR-TX-30842)
- Updated the **Flg Calc [Int P]** report to display at least two decimal places in every allowable stress in the Flange Stress Analysis Results table. (CR-TX-31068)
- Updated the **Floating Head** report to perform alternative rules to determine allowable external pressure for floating heads when “Use ASME Code Case 2286” is selected. (CR-TX-31417)
- Updated the **ASME TS Calc** report to remove the output line for Tube Joint Type when the Tube Weld Joint Type is set to “Full Strength” or “Partial Strength” and the Allowable Joint Load Method is set to “ASME UW-20” and “ASME APP. A”. (CR-TX-31419)
- Updated the **Nozzle Schedule** report to provide a Bill of Materials (BOM), so that it can be included in my output reports as a deliverable. (CR-TX-32018)
- Updated CodeCalc to add rectangular vessel end plate stress formula substitution in the **Rectves Analysis** report. (CR-TX-26396)
- Updated the **External Pressure Calculations** report to replace “N” with “n” in the equation shown for ‘Max Stress in the Stiffener Flange for governing n (Hot and Cold)’, to avoid confusing as there are two parameters, N and n which are used when computing the stress in a stiffening ring per EN 13445 and PD5500. (CR-TX-32529)