



# PipingSolutions, Inc.

6219 Brittmoore Road, Houston, Texas 77041-5114, U.S.A.

Telephone: 713-849-3366 \* FAX: 713-849-3806

E-mail: info@pipingsolutions.com \* Website: www.pipingsolutions.com

## TRI\*TANK 650

### Product

**TRI\*TANK650™** - Designs or re-rates cylindrical tanks with sloped or flat-bottoms in accordance with API 650 Standard, "Welded Steel Tanks for Oil Storage", 8<sup>th</sup>. 9<sup>th</sup>. or 10<sup>th</sup>. Editions. Wind and seismic loads can be applied in the re-rating or design modes, and the allowable criteria of several different wind and seismic standards can be applied.



### Applications

- Provides technical compliance and documentation for regulatory authorities.
- Designs new tanks and rerates existing tanks.
- Calculates shell plate thickness and weights

### The Advantages & Benefits

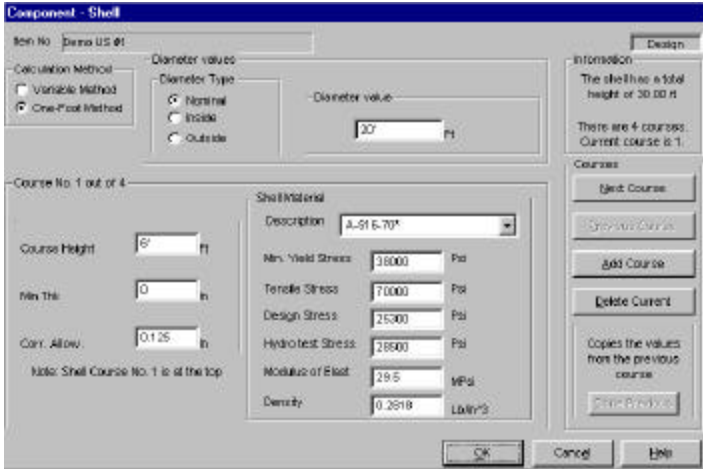
The advantages of using these programs include:

- Saves time and cost in meeting technical compliance and documentation for regulatory authorities.
- The reliability of design calculations is greatly improved.
- Assists in standardization of the design process and procedures through the use of a proven engineered template approach to the design process.
- Decreases the amount of time required for tank design by adding "what-if" design and re-rating capability.
- Enhances productivity by evaluating alternative tank designs prior to fabrication.

### The Company

PipingSolutions, Inc. mission is to provide piping and equipment design software and consulting services to the process industries. PipingSolutions, Inc. develops, markets, and supports high quality engineering design computer software; provides seminars on the applications of PipingSolutions software; provides consulting services, and designs and fabricates pipe supports including engineered spring hangers through its sister company AAA Technology & Specialties Co., Inc.

PipingSolutions produces and markets some of the best software available worldwide to design, analyze, and simulate engineering equipment and processes. Our software development team is dedicated to calculation accuracy, ease of use, and customer service. We strive to make your task easier. Our programs are intuitive and self-explanatory, and the documentation is thorough.



## Capabilities

- Calculates thickness using variable design point method, one-foot methods and methods stated in Appendix A & F of API Standard 650
- Provides option to use roof design guidelines from either API Standard 620 or 650 for conical, domed and umbrella roofs.
- Provides optional sloped or flat bottoms.
- Provides wind loading per ASCE 7-93, NBC (Canada), UBC, API Standard 650 or User defined.
- Provides seismic loading per API Standard 650 or NBC code requirements.
- Calculates tank stability for wind & seismic loads.
- Includes API Standard 650 Appendix M for design & rating of tanks up to 500 °F.
- Considers internal pressure per API Standard 650.
- Calculates uplift for forces & moments for chair design.
- Optimizes the number & size of anchor bolts required by using built-in anchor bolt material properties.
- Calculates minimum wall thickness of nozzles.
- Performs repad calculations in accordance with the API 620 & 650 Standards.
- Calculates cross sectional area required for roof compression rings & wind girders.
- Provides the ability to rerate or to design shell stiffening rings per API Standard 650.
- Provides built-in API Standard 650 material database that can be supplemented by the user for nonstandard materials.
- Calculates MAWP & Max liquid heights for each pressure bearing component when rerate option is selected.
- Enables the user to specify different heights for each course.
- Considers ladders, platforms, and stairways, stiffening rings, insulation weight, wind & seismic calculations.

## Output

- Shows API equations with variable defined and substituted for engineering verification.
- A summary page for each major set of calculations is presented showing calculated values of shell design, wind loads etc.
- Find feature allows the user to go to desired location(s).
- All Output reports can be browsed or printed.

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PROJECT/JOB NO:2001          DATE: 12/28/01
ITEM NUMBER:Demo US 1      PAGE: 5

API-650 SHELL DESIGN CALCULATION
VERSION NUMBER V-1.2-1
*****

SHELL THICKNESS CALCULATION FOR COURSE NUMBER 4
-----
THICKNESS CALCULATION PER SECTION 4.4.1.

      (2.6*0)*(HTLIQ - 1)*G
BTDSN = ----- + CR
            E*21000

      (2.6* 20.00)*( 30.00 - 1)* 1.150
BTDSN = ----- + 0.1250
            0.85*21000

BTDSN = 0.2222 in

ACTUAL COURSE THICKNESS IS THE LARGER OF THE FOLLOWING:
A - USER DEFINED THICKNESS          = 0.0000 in
B - API MINIMUM THICKNESS            = 0.1875 in
C - CALCULATED THICKNESS (BTDSN)    = 0.2222 in

LARGEST THICKNESS                    = 0.2222 in

ACTUAL THICKNESS HAS BEEN ROUNDED
UP TO NEAREST MULTIPLE OF           = 0.1250 in

ACTUAL THICKNESS (BTRACT)            = 0.2500 in

SHELL THICKNESS CALCULATION FOR COURSE NUMBER 3
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**Sole Distributor for Singapore, Malaysia & Indonesia:**  
**Advance Software Solutions Centre Pte Ltd (ASSC)**  
 111 North Bridge Road, #27-01/02 Peninsula Plaza, Singapore 179098.  
 Tel: +65 6254 4326 Fax: +65 6254 4066  
 Email: info@assc-asia.com www.assc-asia.com