PROCESS INDUSTRY PRACTICES

TECHNICAL CORRECTION
August 2017

Vessel

PIP VESTA002
Atmospheric Storage Tank Specification
(Supplement to *API Standard 650*)

PURPOSE AND USE OF PROCESS INDUSTRY PRACTICES

In an effort to minimize the cost of process industry facilities, this Practice has been prepared from the technical requirements in the existing standards of major industrial users, contractors, or standards organizations. By harmonizing these technical requirements into a single set of Practices, administrative, application, and engineering costs to both the purchaser and the manufacturer should be reduced. While this Practice is expected to incorporate the majority of requirements of most users, individual applications may involve requirements that will be appended to and take precedence over this Practice. Determinations concerning fitness for purpose and particular matters or application of the Practice to particular project or engineering situations should not be made solely on information contained in these materials. The use of trade names from time to time should not be viewed as an expression of preference but rather recognized as normal usage in the trade. Other brands having the same specifications are equally correct and may be substituted for those named. All Practices or guidelines are intended to be consistent with applicable laws and regulations including OSHA requirements. To the extent these Practices or guidelines should conflict with OSHA or other applicable laws or regulations, such laws or regulations must be followed. Consult an appropriate professional before applying or acting on any material contained in or suggested by the Practice.

This Practice is subject to revision at any time.

PUBLISHING HISTORY

June 2000	*Issued*
June 2009	*Complete Revision*
October 2012	*Technical Revision*
November 2016	*Technical Revision*
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Scope

This Practice supplements *API 650, Welded Steel Tanks for Oil Storage*. Together, this Practice and *API 650* provide requirements for the construction of atmospheric storage tanks.

This Practice and *API 650* describe minimum construction requirements for the materials, design, fabrication, erection, examination, and testing of aboveground, non-refrigerated storage tanks. This Practice describes additions and modifications made to *API 650.* In addition, this Practice describes decisions made regarding options offered by *API 650*. This Practice supplements, but does not supersede, *API 650* and any applicable jurisdictional requirements.

This Practice covers storage tanks that have design internal pressures of 17.2 kPa (2.5 psig) or less (see *API 650,* Annex F) and design temperatures less than 260°C (500°F) (see *API 650,* Annex M).

This Practice presumes the use of the *API 650* Data Sheet to cover the requirements in *API 650,* and the Data Sheet, as a supplement, to define the additional requirements of this Practice.

References

Applicable parts of the following Practices and industry codes and standards shall be considered an integral part of this Practice. The edition and addendum in effect on the date of contract award shall be used, except as otherwise noted. Short titles are used herein where appropriate.

Process Industry Practices (PIP)

- VEFTA100 - *Tank Miscellaneous Details*
- VEFV1116 - *Vessel Manway Hinges* (included in PIP VEFV1100 and PIP VEFV1100M - *Vessel/S&T Heat Exchanger Standard Details*)
- VEFV1117 - *Vessel Vertical Manway Davits* (included in PIP VEFV1100 and PIP VEFV1100M - *Vessel/S&T Heat Exchanger Standard Details*)

Industry Codes and Standards

- American Petroleum Institute (API)
  - API Standard 650 - *Welded Steel Tanks for Oil Storage*, 12th Edition, including Addendum 2, January 2016
- American Society for Testing and Materials International (ASTM International)
  - ASTM A283/A283M Specification for Low and Intermediate Strength Carbon Steel Plates
- National Fire Protection Association (NFPA)
  - NFPA 11 - *Standard for Low-, Medium, and High-Expansion Foam*

Definitions

Minimum Design Metal Temperature (MDMT): A site-specific temperature which is used in Figures 4-1a and 4-1b to select materials for the tank.

See *API 650* for other definitions.

Requirements

General

If neither *API 650* nor this Practice addresses requirements for miscellaneous items and appurtenances, the additional requirements shall be approved by Purchaser and provided within a supplement to the Purchaser's *API 650* Tank Data Sheet.

Purchaser's Data Sheet shall be used to specify the requirements covered in this Practice. The Data Sheet shall not be used to contradict, void, or diminish any requirement covered in *API 650*. References in this Practice to the "*API 650* Tank Data Sheet" shall mean the data sheet included in *API 650,* Annex L.

The numbering of the following headings and paragraphs in the Requirements section corresponds to the numbering of *API 650,* which this Practice supplements. All of the following requirements are in addition to, or modifications of, those in *API 650*. Provisions of *API 650* that are not revised remain in force.

4. Materials

4.2 Plates

4.2.2(c) *ASTM A283C* shall not be used for shell, shell reinforcement, or tank bottom annular plates for thicknesses greater than 13 mm (1/2 inch).

4.2.10.1 The design metal temperature is defined in *API 650,* Section 3.6. If the MDMT is specified by the Purchaser on the Data Sheet, the MDMT shall be used for the design metal temperature to determine the materials for the tank. For sites covered by *API 650,* Figure 4-2, the MDMT shall not be higher than the lowest one-day mean temperature plus 8°C (15°F). If the MDMT is not specified, the procedures in *API 650* that are based on *API 650,* Figure 4-2, shall be used to determine the materials for the tank.

5. Design

5.1 Joints

5.1.3 Restrictions on Joints

5.1.3.6.1 Unless otherwise specified, fillet welds or groove welds covered in *API 650,* Section 5.1.3.6.1, and with legs or throat dimensions greater than 4.8 mm (3/16 inch) shall be multi-pass.

5.1.3.7 Joints for external attachments (e.g., wind girders, wind girder gussets, stairs, platforms, clip angles, etc.) shall be completely seal welded at every juncture.

For austenitic stainless steel tanks, where service temperature may be in the range of chloride stress corrosion cracking (i.e., equal-to or greater-than 140F), intermittent welds shall not be used.

5.1.3.8 Unless otherwise approved by Purchaser, permanent weld joint backing strips shall not be permitted. See Purchaser's *API 650* Tank Data Sheet.