



PROCESS
INDUSTRY
PRACTICES

TECHNICAL REVISION
January 2022

Vessel

PIP VESV1003
Special Fabrication Requirements
for Welded Vessels and Tanks to Be Lined

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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. Determination concerning fitness for purpose and particular matters or application of the Practice to a 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.

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1. Scope

This Practice describes fabrication requirements for welded vessels, tanks, bins, and silos that are to be lined with nonmetallic linings including liquid-applied and sheet linings. Provisions of this Practice are intended to apply only to surfaces to be lined. This Practice supplements *PIP VECV1001*, *PIP VESV1002*, *PIP VESSM001* and *PIP VESLP001*.

2. References

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

2.1 Process Industry Practices (PIP)

- PIP VECV1001 - *Design Criteria and Purchasing Requirements for Vessels ASME Code Section VIII, Divisions 1 and 2*
- PIP VESLP001 - *Low-Pressure, Welded Vessel Specification*
- PIP VESSM001 - *Specification for Small Pressure Vessels and Heat Exchangers with Limited Design Conditions*
- PIP VESV1002 - *Design and Fabrication Specification for Vessels, ASME Code Section VIII, Divisions 1 and 2*

2.2 Industry Codes and Standards

- NACE International
 - NACE Standard Practice SP0178 - *Design, Fabrication, and Surface Finish Practices for Tanks and Vessels to Be Lined for Immersion Service*

3. Requirements

3.1 Welded Joints to Be Lined

- 3.1.1 For in-plate joints, butt-weld joints shall be used except as permitted in Section 3.1.2.
- 3.1.2 Continuous lap welds may be used for liquid-applied linings in accordance with Table 1, but are not preferred because of the difficulty in obtaining acceptable radii for the welds.
- 3.1.3 Misalignment of plate edges shall not be greater than the limits permitted by the applicable Code or standard, but in any case shall not be greater than the lesser of 3 mm (1/8 inch) or 25 percent of the plate thickness.
- 3.1.4 Mismatched edges shall be blended into the adjacent surfaces by grinding. Minimum required wall thickness shall be maintained.
- 3.1.5 Grinding shall be held to the minimum necessary to provide a minimum radius of 6 mm (1/4 inch) for a smooth surface for the lining.
- 3.1.6 Caulking compounds and putties shall not be used.