

§ 178.338-4

49 CFR Ch. I (10-1-01 Edition)

the material of construction. For a cargo tank constructed of stainless steel, the maximum design stress may not exceed 75 percent of the ultimate tensile strength of the type steel used.

(e) The minimum thickness of the shell or heads of the tank must be 0.187 inch for steel and 0.270 inch for aluminum. However, the minimum thickness for steel may be 0.110 inches provided the cargo tank is:

- (1) Vacuum insulated, or
- (2) Double walled with a load bearing jacket designed to carry a proportionate amount of structural loads prescribed in this section.

(f) Where a tank support is attached to any part of the tank wall, the stresses imposed on the tank wall must meet the requirements in paragraph (a) of this section.

(g) The design, construction, and installation of an appurtenance to the cargo tank or jacket must be such that, in the event of its damage or failure, the lading retention integrity of the tank will not be adversely affected.

(1) A lightweight attachment, such as a conduit clip, brakeline clip or placard holder, must be constructed of a material of lesser strength than the cargo tank wall or jacket material and may not be more than 72 percent of the thickness of the material to which it is attached. The attachment may be secured directly to the cargo tank wall or jacket if the device is designed and installed in such a manner that, if damaged, it will not affect the lading retention integrity of the tank. The lightweight attachment must be secured to the cargo tank wall or jacket by continuous weld or in such a manner as to preclude formation of pockets, which may become sites for incipient corrosion. Attachments conforming with this paragraph are not authorized for cargo tanks constructed under part UHT of the ASME Code.

(2) Except as prescribed in §178.338-3(g)(1), the welding of any appurtenance to the cargo tank wall or jacket must be made by attachment of a mounting pad, so that there will be no adverse affect upon the lading retention integrity of the tank if any force is applied to the appurtenance, from any direction. The thickness of the mounting pad may not be less than

that of the shell or head to which it is attached, and not more than 1.5 times the shell or head thickness. However, a pad with a minimum thickness of 0.187 inch may be used when the shell or head thickness is over 0.187 inch. If weep holes or tell tale holes are used, the pad must be drilled or punched at its lowest point before it is welded. Each pad must—

- (i) Extend at least 2 inches in each direction from any point of attachment of an appurtenance;
- (ii) Be attached by a continuous weld around the pad except for a small gap at the lowest point for draining.

[Amdt. 178-89, 55 FR 37057, Sept. 7, 1990, as amended by Amdt. 178-89, 56 FR 27876, June 17, 1991; 56 FR 46354, Sept. 11, 1991]

§ 178.338-4 Joints.

(a) All joints in the tank, and in the jacket if evacuated, must be as prescribed in the ASME Code, except that a butt weld with one plate edge offset is not authorized.

(b) Welding procedure and welder performance tests must be made in accordance with Section IX of the ASME Code. Records of the qualification must be retained by the tank manufacturer for at least five years and must be made available, upon request, to any duly identified representative of the Department, or the owner of the cargo tank.

(c) All longitudinal welds in tanks and load bearing jackets must be located so as not to intersect nozzles or supports other than load rings and stiffening rings.

(d) Substructures must be properly fitted before attachment and the welding sequence must minimize stresses due to shrinkage of welds.

(e) Filler material containing more than 0.05 percent vanadium may not be used with quenched and tempered steel.

(f) All tank nozzle-to-shell and nozzle-to-head welds must be full penetration welds.

(Approved by the Office of Management and Budget under control number 2137-0017)

[Amdt. 178-77, 48 FR 27704 and 27713, June 16, 1983, as amended at 49 FR 24316, June 12, 1984]