

lading retention integrity of the cargo tank if any force less than that prescribed in paragraph (b)(1) of this section is applied 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 the lowest point before it is welded to the tank. Each pad must:

(i) Be fabricated from material determined to be suitable for welding to both the cargo tank material and the material of the appurtenance or structural support member; a Design Certifying Engineer must make this determination considering chemical and physical properties of the materials and must specify filler material conforming to the requirements of the ASME Code (incorporated by reference; see §171.7 of this subchapter).

(ii) Be preformed to an inside radius no greater than the outside radius of the cargo tank at the attachment location.

(iii) Extend at least 2 inches in each direction from any point of attachment of an appurtenance or structural support member. This dimension may be measured from the center of the structural member attached.

(iv) Have rounded corners, or otherwise be shaped in a manner to minimize stress concentrations on the shell or head.

(v) Be attached by continuous fillet welding. Any fillet weld discontinuity may only be for the purpose of preventing an intersection between the fillet weld and the tank or jacket seam weld.

[Amdt. 178-89, 55 FR 37059, Sept. 7, 1990, as amended by Amdt. 178-89, 56 FR 27876, June 17, 1991; Amdt. 178-104, 59 FR 49135, Sept. 26, 1994; Amdt. 178-105, 59 FR 55173, 55174, 55175, Nov. 3, 1994; 60 FR 17402, Apr. 5, 1995; Amdt. 178-118, 61 FR 51341, Oct. 1, 1996; 65 FR 58631, Sept. 29, 2000; 68 FR 19283, Apr. 18, 2003; 68 FR 75755, Dec. 31, 2003; 74 FR 16143, Apr. 9, 2009; 78 FR 60755, Oct. 2, 2013]

#### § 178.345-4 Joints.

(a) All joints between the cargo tank shell, heads, baffles, baffle attaching rings, and bulkheads must be welded in conformance with Section VIII of the ASME Code (IBR, see §171.7 of this subchapter).

(b) Where practical all welds must be easily accessible for inspection.

[Amdt. 178-89, 54 FR 25022, June 12, 1989, as amended by Amdt. 178-118, 61 FR 51341, Oct. 1, 1996; 68 FR 75756, Dec. 31, 2003]

#### § 178.345-5 Manhole assemblies.

(a) Each cargo tank with capacity greater than 400 gallons must be accessible through a manhole at least 15 inches in diameter.

(b) Each manhole, fill opening and washout assembly must be structurally capable of withstanding, without leakage or permanent deformation that would affect its structural integrity, a static internal fluid pressure of at least 36 psig, or cargo tank test pressure, whichever is greater. The manhole assembly manufacturer shall verify compliance with this requirement by hydrostatically testing at least one percent (or one manhole closure, whichever is greater) of all manhole closures of each type produced each 3 months, as follows:

(1) The manhole, fill opening, or washout assembly must be tested with the venting devices blocked. Any leakage or deformation that would affect the product retention capability of the assembly shall constitute a failure.

(2) If the manhole, fill opening, or washout assembly tested fails, then five more covers from the same lot must be tested. If one of these five covers fails, then all covers in the lot from which the tested covers were selected are to be 100% tested or rejected for service.

(c) Each manhole, filler and washout cover must be fitted with a safety device that prevents the cover from opening fully when internal pressure is present.

(d) Each manhole and fill cover must be secured with fastenings that will prevent opening of the covers as a result of vibration under normal transportation conditions or shock impact