

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 in Section IX of the ASME Code (IBR, 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 attached structural member.

(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 a tank or jacket seam weld.

[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; 68 FR 19281, Apr. 18, 2003; 68 FR 57633, Oct. 6, 2003; 68 FR 75754, Dec. 31, 2003]

#### § 178.338-4 Joints.

(a) All joints in the tank, and in the jacket if evacuated, must be as prescribed in Section VIII of the ASME Code (IBR, see §171.7 of this subchapter), 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 weld-

ing 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; 68 FR 75754, Dec. 31, 2003]

#### § 178.338-5 Stiffening rings.

(a) A tank is not required to be provided with stiffening rings, except as prescribed in Section VIII of the ASME Code (IBR, see §171.7 of this subchapter).

(b) If a jacket is evacuated, it must be constructed in compliance with §178.338-1(f). Stiffening rings may be used to meet these requirements.

[Amdt. 178-77, 48 FR 27704, June 16, 1983, as amended at 68 FR 75754, Dec. 31, 2003]

#### § 178.338-6 Manholes.

(a) Each tank in oxygen service must be provided with a manhole as prescribed in Section VIII of the ASME Code (IBR, see §171.7 of this subchapter).

(b) Each tank having a manhole must be provided with a means of entrance and exit through the jacket, or the jacket must be marked to indicate the manway location on the tank.

(c) A manhole with a bolted closure may not be located on the front head of the tank.

[Amdt. 178-77, 48 FR 27704, June 16, 1983, as amended at 49 FR 24316, June 12, 1984; 68 FR 75754, Dec. 31, 2003]

#### § 178.338-7 Openings.

(a) The inlet to the liquid product discharge opening of each tank intended for flammable loadings must be at the bottom centerline of the tank.

(b) If the leakage of a single valve, except a pressure relief valve, pressure control valve, full trycock or gas phase manual vent valve, would permit loss of flammable material, an additional closure that is leak tight at the tank