TM-110.3 CASTINGS

Cast material may be used in the construction of vessels and vessel parts. Specifications for acceptable casting materials are listed in Tables TM-130.2-1 through TM-130.2-7 and the maximum allowable stress values in Section II, Part D. Castings shall comply with the additional requirements in TM-190. The allowable stress values shall be multiplied by the applicable casting quality factor given in TM-190.

TM-110.4 PIPE AND TUBES

Pipe and tubes of seamless or welded construction conforming to one of the specifications given in Tables TM-130.2-1 through TM-130.2-7 may be used for shells and other parts of transport tanks. Allowable stress values for the materials used in pipe and tubes are given in Section II, Part D.

TM-110.5 WELDING MATERIALS

Welding materials used for production shall comply with the requirements of this Section, Section IX, and the applicable qualified welding procedure specification. When the welding materials comply with one of the specifications in Section II, Part C, the marking or tagging of the material, containers, or packages as required by the applicable Section II specification may be accepted for identification in lieu of a Material Test Report or a Certificate of Compliance. When the welding materials do not comply with one of the specifications of Section II, the marking or tagging shall be identifiable with the welding materials set forth in the welding procedure specification and may be accepted in lieu of a Material Test Report or a Certificate of Compliance.

TM-110.6 BOLTS AND STUDS

(a) Bolts and studs may be used for the attachment of removable parts. Permissible specifications are listed in Tables TM-130.2-1 through TM-130.2-7. Nuts and bolts shall conform to the requirements of TM-110.6 and the additional rules in TM-150.1, TM-150.2, or TM-160.1, as applicable. The allowable stresses for bolting materials are given in Section II, Part D, Subpart 1, Table 3.

(b) Studs shall be threaded full length or shall be machined down to the root diameter of the thread in the unthreaded portion, provided that the threaded portions are at least 1½/2 diameters in length. Studs greater than eight diameters in length may have an unthreaded portion that has the nominal diameter of the thread, provided the following requirements are met:

(1) the threaded portions shall be at least 1½/2 diameters in length
(2) the stud shall be machined down to the root diameter of the thread for a minimum distance of 0.5 diameters adjacent to the threaded portion
(3) a suitable transition shall be provided between the root diameter and the unthreaded portion

(4) particular consideration shall be given to any dynamic loadings

TM-110.7 NUTS AND WASHERS

(a) Nuts shall conform to the requirements in the applicable paragraph elsewhere in this Code (see TM-150.1, TM-150.2, and TM-160.2). They shall engage the threads for the full depth of the nut.

(b) The use of washers is optional. When used, they shall be of wrought materials.

TM-110.8 RODS AND BARS

Rod and bar stock may be used in the vessel construction for pressure parts such as flange rings, stiffening rings, frames for reinforced openings, stays and stay-bolts, and similar parts. Rod and bar materials shall conform to the requirements for bars or bolting in the applicable section elsewhere in this Code (see TM-150.4).

TM-110.9 FERRITIC STEELS WITH TENSILE PROPERTIES ENHANCED BY HEAT TREATMENT

Except when specifically prohibited by Part TM (see TM-180.2 and TW-130.7), steels listed in Table TM-130.2-6 may be used for the entire vessel or for individual components that are joined to other Grades listed in that Table or to other steels conforming to the specifications in Tables TM-130.2-1 or TM-130.2-2. The maximum allowable stress values for the materials listed in Table TM-130.2-6 are given in Section II, Part D.

TM-110.10 PREFABRICATED OR PREFORMED PRESSURE PARTS FURNISHED WITHOUT A CERTIFICATION MARK

(a) Prefabricated or preformed pressure parts for pressure vessels that are subject to stresses due to pressure and that are furnished by others instead of the Manufacturer of the completed vessel shall conform to all applicable requirements of this Section except as permitted in (b) through (e). When the prefabricated or preformed parts are furnished with a nameplate that contains product-identifying marks and the nameplate interferes with further fabrication or service, and where stamping on the material is prohibited, the Manufacturer of the completed vessel with the concurrence of the Authorized Inspector may remove the nameplate. The removal of the nameplate shall be noted in the “Remarks” section of the tank Manufacturer’s Data Report. The nameplate shall be destroyed. The rules of (b) through (e) shall not be applied to quick-actuating closures. Parts furnished under the provisions of (b), (c), and (d) need not be manufactured by a Certificate of Authorization Holder. Prefabricated or preformed pressure parts may be supplied as follows:

(1) cast, forged, rolled or die-formed nonstandard pressure parts