Part 642 – Specifications

Chapter 3 – National Standard Material Specifications

Material Specification 581—Metal

A. Scope

This specification covers the quality of steel, stainless steel, and aluminum alloys.

B. Structural Steel

(1) Structural steel must conform to the requirements of ASTM A36.
(2) High-strength low-alloy structural steel must conform to ASTM A242 or A588.
(3) Carbon steel plates of structural quality to be bent, formed, or shaped cold must conform to ASTM A283, Grade C.
(4) Carbon steel sheets of structural quality must conform to ASTM A1011, Grade 40, or A1008, Grade 40.
(5) Carbon steel strip of structural quality must conform to ASTM A1011, Grade 36.
(6) Stainless steel must conform to ASTM A240, A320, A276, A269, A582; Type 302, 303, 304, or 304L.

C. Commercial or Merchant Quality Steel

Commercial or merchant quality steel must conform to the requirements of the applicable ASTM listed below:

Product	ASTM standards
Carbon steel bars	A575, Grade M 1015 to Grade M 1031
Carbon steel sheets	A1011
Carbon steel strips	A1011
Zinc-coated carbon steel sheets	A653 or A924

D. Aluminum Alloy

Aluminum alloy products must conform to the requirements of the applicable ASTM standard listed below. Unless otherwise specified, alloy 6061-T6 must be used.

Product	ASTM standards
Standard structural shape	B308
Extruded structural pipe and tube	B429
Extruded bars, rods, shapes, and tubes	B221
Drawn seamless tubes	B210
Rolled or cold-finished bars, rods, and wire	B211
Sheet and plate	B209

E. Bolts

(1) Steel bolts must conform to the requirements of ASTM A307. If high-strength bolts are specified, they must conform to the requirements of ASTM F3125.
(2) When galvanized or zinc-coated bolts are specified, the zinc coating must conform to the requirements of ASTM A153, except that bolts 0.5 inch or less in diameter may be coated with electro-deposited zinc or cadmium coating conforming to the requirements of ASTM B633, Service Condition SC 3, or ASTM B766, unless otherwise specified.
(3) Stainless steel bolts must conform to ASTM A320.

F. Rivets

Unless otherwise specified, steel rivets must conform to the requirements of ASTM A31, Grade B. Unless otherwise specified, aluminum alloy rivets must be Alloy 6061 conforming to the requirements of ASTM B316.

G. Welding Electrodes

(1) Steel welding electrodes must conform to the requirements of American Welding Society Specification AWS A5.1, "Specification for Mild Steel Covered Arc-Welding Electrodes," except that they must be uniformly and heavily coated (not washed) and must be of such a nature that the coating does not chip or peel while being used with the maximum amperage specified by the manufacturer.
(2) Aluminum welding electrodes must conform to the requirements of American Welding Society Specification AWS A5.10, "Specification for Aluminum and Aluminum-Alloy Welding Rods and Bare Electrodes."
(3) Stainless steel electrodes must conform to the requirements of AWS A5.22/ A5.22M:2012 Specification for Stainless Steel Electrodes for Flux Cored Arc Welding and Stainless Steel Flux Cored Rods for Gas Tungsten Arc Welding.