



STANDARDS

STAINLESS SHEET STEEL FOR STRUCTURAL BUILDING PRODUCTS

1 SCOPE

The following standards apply to type 300 series stainless sheet steel for structural building products.

2 MATERIALS

(a) General

Chemical and physical standards and tolerances are as defined in the latest revision of the steel products manual "Stainless and Heat Resisting Steels", published by the American Iron and Steel Institute.

This bulletin is concerned with type 300 series stainless steels in cold rolled sheet and strip, defined as follows:

- (i) Sheet means coils or cut lengths, 24 inches and over in width, and under $\frac{3}{16}$ inch in thickness.
- (ii) Strip means coils or cut lengths, under 24 inches in width, and from under $\frac{3}{16}$ inch to 0.005 inch thickness.

(b) Alloys

Many chromium nickel alloy stainless steels are produced. The following are those commonly used in the building construction industry. (see Table I for pertinent alloy properties):

- (i) Type 301—contains the least amount of chromium and nickel of the 300 series family, which makes it the most economical, and the most responsive to increased strength by cold work.
- (ii) Type 302—is the basic 18/8 stainless steel type and is widely used as a general purpose stainless alloy.
- (iii) Type 304—the low carbon content makes it the general purpose alloy for welded applications.

(iv) Type 316—has superior corrosion resistance relative to other chromium-nickel steels when exposed to many types of chemical corrodents, as well as marine atmospheres.

(v) Versalloy—a controlled analysis alloy combining the more desirable physical and workability characteristics of types 301 and 302.

(vi) Ezeform—a mechanically textured strip or sheet which is fully annealed to provide ease of fabrication.

Versalloy and Ezeform are proprietary stainless steels included because of common usage in the Canadian Building Construction Industry.

(c) Finishes

- (i) No. 2D—a dull cold rolled finish produced by cold rolling, annealing, and descaling.
- (ii) No. 2B—a brighter cold rolled finish commonly produced the same as No. 2D, except that the annealed and descaled sheet receives a final light cold rolled pass on polished rolls.
- (iii) No. 4—a general purpose polished finish. Following in initial grinding with coarser abrasives, sheets are generally finished last with abrasives approximately 120 to 150 mesh.

Varying finish lustre, pattern and textured finish are proprietary to certain manufacturers. The designer is requested to consult with the appropriate CSSBI member companies for further details.

3 MATERIAL SPECIFICATION

(a) Gauge

It is common practice to specify the thick-

ness of the metal in decimals of an inch. If a gauge number is preferred, the U.S. Standard Gauge is used, not the Manufacturers' Standard Gauge used for carbon steel sheets. Table II provides for cross reference, thickness tolerances, and nominal weights.

(b) Alloy

The alloy is specified by type number (or mill trade name or number for proprietary alloys) conforming to ASTM A 167 (latest revision).

(c) Finish

The finish is specified by number (or mill trade name or number for proprietary finishes) conforming to samples to be submitted for approval.

(d) Typical Specification

The stainless steel sheet for (specify the application) shall be fabricated from inch (..... US standard gauge) Type (or specify mill trade-name where applicable). The weather surface shall have No. finish (or specify mill number for proprietary finishes) in accordance with samples to be submitted for approval.

Example:

The stainless steel sheet for the exterior sheet of the insulated wall panel shall be fabricated from 0.025 inches (24 US Standard Gauge) Type 302 conforming to ASTM Specification A167 (latest revision). The weather surface shall have No. 4 finish in accordance with samples to be submitted for approval.

**TABLE I
CHEMICAL, PHYSICAL AND MECHANICAL PROPERTIES**

Alloy	Chemical Composition %	Tensile Strength psi	Yield Strength (offset 0.2%) psi	Elongation in 2 in. %	Modulus of Elasticity in Tension psi	Coefficient of Thermal Expansion per °F (32 - 212°F)	Thermal Conductivity BTU/hr/sq ft/ft/°F
Type 301 Annealed	Cr: 16-18 Ni: 6-8 C: 0.15 max.	110,000 (75,000)	40,000 (30,000)	60 (40)	28.0 x 10 ⁶	9.4 x 10 ⁻⁶	9.4
Type 302 Annealed	Cr: 17-19 Ni: 8-10 C: 0.15 max.	90,000 (75,000)	40,000 (30,000)	50 (40)	28.0 x 10 ⁶	9.6 x 10 ⁻⁶	9.4
Type 304 Annealed	Cr: 18-20 Ni: 8-12 C: 0.08 max.	84,000 (75,000)	42,000 (30,000)	55 (40)	28.0 x 10 ⁶	9.6 x 10 ⁻⁶	9.4
Type 316 Annealed	Cr: 16-18 Ni: 10-14 Mo: 2-3 C: 0.08 max.	84,000 (75,000)	42,000 (30,000)	50 (40)	28.0 x 10 ⁶	8.9 x 10 ⁻⁶	9.4
Versalloy Annealed	Cr: 17 typical Ni: 8 C: 0.15 max.	100,000 (75,000)	40,000 (30,000)	55 (40)	28.0 x 10 ⁶	9.6 x 10 ⁻⁶	9.4
Ezeform	Cr: 16-20 Ni: 6-11 C: 0.15 max.	84,000 to 110,000 (75,000)	40,000 (30,000)	50-60 (40)	28.0 x 10 ⁶	8.9-9.6 x 10 ⁻⁶	9.4
Col. 1	2	3	4	5	6	7	8

Cr—Chrome; Ni—Nickel; C—Carbon; Mo—Molybdenum

NOTE:

The values given are the representative values published by the AISI. Bracketed values (2) are those given as minimums in Table II, ASTM A 167-63, Corrosion-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip. Additional increased strengths can be obtained by temper rolling for which the mills should be consulted.

TABLE II
THICKNESS INCREMENTS
 (Source, Tables III & VIII, ASTM A 167-63)

U.S. Standard Gauge No.	Nominal Thickness in.	Tolerance Over & Under in.	Nominal* Weight lbs/sq. ft.
8	0.1719	0.014	7.2187
9	0.1562	0.014	6.5625
10	0.1406	0.012	5.9062
11	0.1250	0.010	5.2500
12	0.1094	0.009	4.5937
13	0.0937	0.008	3.9375
14	0.0781	0.007	3.2812
15	0.0703	0.006	2.9531
16	0.0625	0.006	2.6250
17	0.0562	0.005	2.3625
18	0.0500	0.005	2.1000
19	0.0437	0.005	1.8375
20	0.0375	0.004	1.5750
21	0.0344	0.004	1.4437
22	0.0312	0.004	1.3125
23	0.0281	0.004	1.1813
24	0.0250	0.003	1.0500
25	0.0219	0.003	0.9187
26	0.0187	0.003	0.7875
27	0.0172	0.003	0.7224
28	0.0156	0.002	0.6552
29	0.0141	0.002	0.5922
30	0.0125	0.002	0.5250
1	2	3	4

*Density of 300 series stainless steels is 42 lbs/sq. ft. per inch of thickness.