Stainless Steel

Bar, Sheet, Plate, Structural, Tube & Pipe

WARNING: These products can potentially expose you to chemicals including Nickel, Chromium, Lead, Cobalt, Mercury and Beryllium, which are known to the state of California to cause cancer and/or birth defects or other reproductive harm. For more information, visit www.P65Warnings.ca.gov

Grade 201

201 alloy is a high performance austenitic stainless steel formulated to have a lower and more stable cost due to the substitution of manganese for a portion of the nickel used in 300 series stainless steels such as Type 304.

In addition, the chemical composition of alloy 201 provides higher annealed mechanical properties than type 304 which can result in an additional benefit of weight reduction. The 201 tensile strength is about 10% higher than Type 304 which may allow for thinner gauges and therefore less material. However, due to the lower Chromium and Nickel content, Type 201 stainless may not have the same corrosion resistance as Type 304.

Typical Applications

Commercial and residential food service applications, architectural end uses such as handrails and support frame work, washing machines, hose clamps, sinks, containers and structural components of truck trailers and railcars.

Typical Analysis	Grade 201
Chrome	16.00 - 18.00
Nickel	3.50 - 5.50
Carbon	0.15 max.
Manganese	5.50 - 7.50
Silicon	1.00 max.
Sulphur	0.03 max.
Phosphorus	0.06 max.
Nitrogen	0.25 max.
Iron	Balance
Mechanical Properties	**(Annealed)**
Brinell Hardness	175
Tensile–KSI	105
Yield–KSI	45
Elongation in 2"-%	58
Red. in Area-% Min	88
Welding Characteristics	Very good
Machining Compared to B1112 Screw Stock	45%
Specifications	**201 (Sheet)**
ASTM	A240

Grade 303

303 is a free-machining variation of 304. The addition of sulfur for better machinability makes this a favorite for use in automatic screw machines. Corrosion resistant to atmospheric exposures, as well as a wide range of chemicals; most dyes, foods and nitric acid.

Typical Applications

Bolts, bushings, nuts, shafts, and parts produced on automatic screw machines.

Typical Analysis	Grade 303/303 G&P
Chrome	17.0 - 19.0
Nickel	8.0 - 10.0
Carbon	0.15 max.
Manganese	2.00 max.
Silicon	1.00 max.
Molybdenum	0.60 max.
Sulphur	0.15 min.
Mechanical Properties	**(Annealed)**
Brinell Hardness	160
Tensile–KSI	90
Yield–KSI	35
Elongation in 2"-%	50
Red. in Area-% Min	55
Welding Characteristics	Fusion welding not recommended
Machining Compared to B1112 Screw Stock	70%
Specifications	**303 (Bar)**
AISI	303
ASTM	A581, A582
AMS	5640

Grade 304/304L

The most widely used of the austenitic grades, 304 offers good corrosion resistance to many chemicals and industrial atmospheres. Generally considered non-magnetic, it can become slightly magnetic when cold-worked. 304 is non-hardenable by heat treatment. In 304L, the carbon content has been lowered to .03% max. for corrosion resistance at heat affected zones from welding.

Typical Applications

Architectural trim, beer barrels, cryogenic vessels, dairy equipment, and a wide variety of most food applications.

Typical Analysis	Grade 304	Grade 304L
Chrome	18.00 - 20.00	18.00 - 20.00
Nickel	8.00 - 11.00	8.00 - 11.00
Carbon	0.08 max.	0.03 max.
Manganese	2.00 max.	2.00 max.
Silicon	1.00 max.	1.00 max.
Molybdenum		
Other		
Mechanical Properties		**(Annealed)**
Brinell Hardness	170	160
Tensile–KSI	85	75
Yield–KSI	34	30
Elongation in 2"-%	60	60
Red. in Area-% Min	70	–
Welding Characteristics	Very good - tough welds	
Machining Compared to B1112 Screw Stock	45%	
Specifications		
AISI	**304 (Bar)**	**304L (Bar)**
ASTM	A276, A479, A580	A276,A479
AMS	5639	5647
QQS	763	763
AISI	**304 (Sheet)**	**304 (Plate)**
ASTM	A240	A240
AMS	5513	5513

Grade 309

Type 309 is an austenitic chromium nickel stainless steel (. 08% max carbon). Type 309 is employed for parts requiring both corrosion and heat resistance and oxidation resistance up to 2000 °F. Strength at elevated temperatures is similar to that of 18-8 Stainless Steels.

The 309 grades of stainless steel are noted for excellent corrosion and heat resistance. In general 309 and 309S are more resistant than type 304. They provide high resistance to sulfite liquors and are often chosen for applications where the metal may be exposed to acids including nitric, nitric-sulfur, citric, lactic and more.

Plates can be hot or cold formed as well as annealed to optimize corrosion resistance. It can also be welded by typical methods The machinability of 309 is similar to grade 304.

Typical Applications

Furnace equipment, oven linings, annealing boxes, thermowells, baffle plates, quenching pots for salt, valves and fittings.

Typical Analysis	Grade 309
Chrome	22.0 - 24.0
Nickel	12.0 - 15.0
Carbon	0.08 max.
Manganese	2.00 max.
Silicon	1.00 max.
Molybdenum	0.75 max.
Sulphur	0.03 max.
Phosphorus	0.04 max.
Copper	0.75 max.
Iron	Balance
Mechanical Properties	**(Annealed)**
Brinell Hardness	160
Tensile–KSI	75
Yield–KSI	30
Elongation in 2"-%	40
Red. in Area-% Min	-
Welding Characteristics	-
Machining Compared to B1112 Screw Stock	45%
Specifications	**309**
AISI	309
ASTM	A167
AMS	5523

Grade 316L

316L is an austenitic chrome nickel steel with superior corrosion resistance to that of other chrome nickel steels. Widely used when exposed to chemical corrodents, as well as marine atmospheres. 316L is generally considered non-magnetic, but can become magnetic when cold worked. In 316L, the carbon content has been lowered to .03% max. for corrosion resistance at heat affected zones from welding.

Typical Applications

Acetic acid compounds, kettles for cooking catsup, pulp and paper processing equipment, water softener tanks, and many marine applications.

Typical Analysis	Grade 316L
Chrome	16.00 - 18.00
Nickel	10.00 - 14.00
Carbon	0.03 max.
Manganese	2.00 max.
Silicon	1.00 max.
Molybdenum	2.00 - 3.00
Other	
Mechanical Properties	**(Annealed)**
Brinell Hardness	160
Tensile–KSI	75
Yield–KSI	30
Elongation in 2"-%	60
Red. in Area-% Min	—
Welding Characteristics	Very good - tough welds
Machining Compared to B1112 Screw Stock	45%
Specifications	
AISI	**316L (Bar)**
ASTM	A276, A479, A580
AMS	5653
QQS	763
AISI	**316L (Sheet/Plate)**
ASTM	A240
AMS	5507

Grade 2205

Duplex 2205 is a two phase, ferritic, austenitic 22% chromium, 3% molybdenum, 5-6% nickel alloyed stainless steel. It is characterized by high yield strength and good corrosion resistance.

Typical Applications

Machined parts, pump shafts, bushings, mining machinery, screws, valves, cutlery, oil burner Processing Equipment, Transport, Storage and Chemical Processing, Oil & Gas

Typical Analysis	Grade 2205
Chrome	22.0 - 23.0
Nickel	4.5 - 6.5
Molybdenum	3.0 - 3.5
Manganese	2.00 max.
Silicon	1.00 max.
Carbon	0.30 max.
Nitrogen	0.20 max.
Phosphorus	0.030 max.
Sulphur	0.020 max.
Iron	Balance
Mechanical Properties	**(Annealed)**
Brinell Hardness	31 HRC max.
Tensile–KSI	95 min.
Yield–KSI	65 min.
Elongation in 2"-%	25% min.
Density	.283 lb/in^3
Welding Characteristics	Good weldability
Machining Compared to B1112 Screw Stock	-
Specifications	
ASTM	A240
ASME	AS-240

Grade 409

409 is a general purpose stainless steel with 11% chromium. 409 is especially useful for applications requiring oxidation or corrosion protection beyond the capability of carbon steel and some coated steels. 409 has good oxidation resistance and formability, but lower corrosion resistance due to the chromium content. 409 is not as corrosion resistant as 304, 430 or 439 grades, but far superior to mild carbon steel. 409 can be formed by roll forming, stretch bending, deep drawing or pressing.

Typical Applications

Automotive exhaust system applications such as manifolds, exhaust pipes, catalytic converters, mufflers, tail pipes and other components. Non automotive exhaust applications such as home heating systems, automotive thermostats and fuel filters, electrical transformer cases, caskets and heat exchanger tubing.

Typical Analysis	Grade 409
Chrome	10.50 - 11.70
Nickel	0.50
Carbon	0.03
Manganese	1.00
Silicon	1.00
Molybdenum	-
Other	-
Mechanical Properties	
Brinell Hardness	≤ 88 (179)
Tensile–KSI	55 (380)
Yield–KSI	25 (170)
Elongation in 2"-%	≥ 20
Red. in Area-% Min	-
Welding Characteristics	Successful in TIG-laser, HF, MIG and Spot Welding
Machining Compared to B1112 Screw Stock	
Specifications	
AISI	
ASTM	A240
AMS	
QQS	
AISI	
ASTM	
AMS	

Grade 410

410 is a martensitic stainless steel that is air or oil hardened and responds well to hardening and tempering operations. Considered a 12% chromium steel, it offers superb combinations of strength and toughness depending on degree of heat treatments. In the annealed condition, it is a ready choice for forming and cold heading.

Typical Applications

Machined parts, pump shafts, bushings, mining machinery, screws, valves, cutlery, oil burner parts and hardware.

Typical Analysis	Grade 410
Chrome	11.5-13.5
Carbon	.15 max.
Manganese	1.00 max.
Phosphorus	.040 max.
Sulphur	.025 max.
Silicon	1.00 max.
Mechanical Properties	**(Annealed)**
Brinell Hardness	185
Tensile–KSI	95
Yield–KSI	65
Elongation in 2"-%	30
Red. in Area-% Min	70
Welding Characteristics	Can be readily welded Pre-heat recommended
Machining Compared to B1112 Screw Stock	54%
Specifications	
AISI	410
ASTM	A193, A194, A276, A314, A479
AMS	5612, 5613

Grade 416

416 is a martensitic chromium steel to which elements have been added to enhance the machinability. 416 is the most readily machinable of all the stainless steels and is suitable for use in automatic screw machines. 416 is less corrosion resistant than the chrome-nickel steels. It is magnetic in all conditions.

Typical Applications

Aircraft fittings, bolts, nuts, studs, rivets, screws, many nonseizing and nongalling applications.

Typical Analysis	Grade 416
Chrome	12.00-14.00
Nickel	
Carbon	.15 max.
Manganese	1.25 max.
Silicon	1.00 max.
Molybdenum	.06 max.
Sulphur	.15 min.
Mechanical Properties	**(Annealed)**
Brinell Hardness	155
Tensile–KSI	75
Yield–KSI	40
Elongation in 2"-%	30
Red. in Area-% Min	60
Welding Characteristics	Poor brittle welds
Machining Compared to B1112 Screw Stock	90%
Specifications	**416 (Bar)**
AISI	416
ASTM	A581, A582
AMS	5610

Grade 420

420 is a martensitic chrome steel capable of hardening to a maximum of approximately 500 Brinell. It has its optimum corrosion resisting qualities in the hardened and tempered condition. 420 is magnetic in all conditions.

Typical Applications

Flatware knife blades, glass molds, hand tools, vegetable choppers.

Typical Analysis	Grade 420
Chrome	12.00-14.00
Carbon	.15 min.
Manganese	1.0 max.
Silicon	1.0 max.
Molybdenum	
Other	
Mechanical Properties	**(Annealed)**
Brinell Hardness	195
Tensile–KSI	95
Yield–KSI	50
Elongation in 2"-%	25
Red. in Area-% Min	55
Welding Characteristics	Fair - Preheat 400°-500° Anneal at 1300° after welding
Machining Compared to B1112 Screw Stock	54%
Specifications	**420 (Bar)**
AISI	420
ASTM	A276
AMS	5621
QQS	763

Grade 430

430 stainless steel has good corrosion resistance combined with good formability. 430 is very similar to 439 grade stainless steel with slightly less chromium at 16% minimum content. 430 is more oxidation resistant and corrosion resistant than 409 grade. 430 is a popular non-hardenable grade most commonly used in indoor environments. 430 is readily cold formed by bending, deep drawing and stretch forming. 430 is relatively easy to machine and is comparable to that of structural carbon steel requiring the same recommendations regarding tooling, cutting speeds and cutting feeds. 430 can be welded although it may require annealing.

Typical Applications

Appliances, food equipment, automotive, flue liners and roofing.

Typical Analysis	Grade 430
Chrome	14.00 - 18.00
Carbon	.12 max.
Nickel	
Manganese	1.0 max.
Silicon	1.0 max.
Molybdenum	
Other	
Mechanical Properties	**(Annealed)**
Brinell Hardness	155
Tensile–KSI	75
Yield–KSI	45
Elongation in 2"-%	30
Red. in Area-% Min	65
Welding Characteristics	Fair - Brittle welds Slight response to annealing
Machining Compared to B1112 Screw Stock	54%
Specifications	**430 (Sheet/Plate)**
AISI	430
ASTM	A176
AMS	5503

Grade 439

439 stainless steel has good corrosion resistance due to its 17% minimum chromium content. 439 can be formed using a wide range of roll forming or mild stretch bending operations as well as more common drawing and bending operations. Special adjustment to chemical composition give this alloy excellent formability. 439 is more oxidation resistant and corrosion resistant than 409 grade. 439 has high thermal conductivity and low thermal expansion.

Typical Applications

Automotive exhaust components, heating units and evaporator tubes.

Typical Analysis	Grade 439
Chrome	17.00 - 19.00
Carbon	0.030
Nickel	0.50
Manganese	1.00
Silicon	1.00
Molybdenum	
Other	
Mechanical Properties	**(Annealed)**
Brinell Hardness	≤ 89 (183)
Tensile–KSI	60 (415)
Yield–KSI	30 (205)
Elongation in 2"-%	≥ 22
Red. in Area-% Min	-
Welding Characteristics	Prone to grain growth in heat affected zone of weldment = poor tensile, fatigue and toughness in welded area.
Machining Compared to B1112 Screw Stock	
Specifications	**439 (Sheet)**
AISI	439
ASTM	A240
AMS	

Grade 440C

440C is a martensitic chrome steel that is capable of acquiring, upon heat treatment, the highest hardness of any type of corrosion resisting steels. It has its optimum corrosion resisting qualities in the hardened and tempered condition and is magnetic in all conditions.

Typical Applications

Instrument bearings, nozzles, steel balls and seats for oil well pumps, valve parts.

Typical Analysis	Grade 440C
Chrome	16.00-18.00
Nickel	
Carbon	.95-1.20
Manganese	1.0 max.
Silicon	1.0 max.
Molybdenum	.75 max.
Other	
Mechanical Properties	**(Annealed)**
Brinell Hardness	230
Tensile–KSI	110
Yield–KSI	65
Elongation in 2"-%	14
Red. in Area-% Min	25
Welding Characteristics	Not recommended
Machining Compared to B1112 Screw Stock	30%
Specifications	**440C (Bar)**
AISI	440C
ASTM	A276, A580
AMS	5630
QQS	763

Grade 17-4 PH (630)/17-4 G&P/17-4 H900 G&P

17-4 is a martensitic precipitation hardening (maraging) steel that combines high strength and hardness with a moderate level of corrosion resistance. A simple one-step aging treatment in the range of 900 to 1150 degrees hardens the alloy to its design strength levels.

Typical Applications

High strength fittings, valves, bolts, shafting, pump parts, medical instruments.

Typical Analysis	Gr. 17-4, 17-4 G&P, 17-4 H900 G&P
Chrome	15.00-17.50
Nickel	3.00-5.00
Carbon	.07 max.
Manganese	1.00 max.
Silicon	1.00 max.
Molybdenum	
Copper	3.00-5.00
Mechanical Properties	**(Solution Treated)**
Brinell Hardness	332
Tensile–KSI	160
Yield–KSI	145
Elongation in 2"-%	15
Red. in Area-% Min	55
Welding Characteristics	
Machining Compared to B1112 Screw Stock	45%
Specifications	**17-4 (Bar)**
AISI	S17400
ASTM	A564
AMS	5643
QQS	–

Hardness Properties					Gr. 17-4, 17-4 G&P, 17-4 H900 G&P		
Code	UTS min (kis)	YS min (kis)	El min (%)	RA min (%)	Hardness min HRC / HB	Hardness max HRC / HB	Charpy min (ft-lb)
H925	170	155	10	44	38 / 375	45 / 429	5
H1025	155	145	12	45	35 / 331	42 / 401	15
H1050	155	145	13	45	32 / 311	38 / 375	15
H1075	145	125	13	45	32 / 311	38 / 375	20
H1100	140	115	14	45	31 / 302	37 / 363	25
H1150	135	105	16	50	28 / 277	37 / 352	30
H1150M	115	75	18	55	24 / 255	---	55
H1150D	125	105	16	50	24 / 255	33 / 311	30

Stainless Rounds

Standard Lengths: 12 foot random

AISI	303, 303 G&P	304 / 304L	316L, 316L BSQ	416, 416R
	17-4 PH	17-4 G&P	17-4 H900	416 PSQ
	410	420	440C	

Size (inches)	Weight (lbs./ft.)	Size (inches)	Weight (lbs./ft.)	Size (inches)	Weight (lbs./ft.)	Size (inches)	Weight (lbs./ft.)
1/16	.010	1-1/8	3.379	2-5/8	19.322	6-1/2	117.584
3/32	.023	1-3/16	3.766	2-11/16	20.248	6-3/4	127.532
1/8	.042	1-1/4	4.173	2-3/4	21.181	7	136.987
5/32	.065	1-5/16	4.600	2-13/16	22.150	7-1/4	146.780
3/16	.094	1-3/8	5.049	2-7/8	23.125	7-1/2	156.911
7/32	.128	1-7/16	5.518	2-15/16	24.121	7-3/4	167.380
1/4	.167	1-1/2	6.008	3	25.155	8	178.187
9/32	.211	1-9/16	6.520	3-1/8	27.270	8-1/2	201.935
5/16	.261	1-5/8	7.051	3-1/4	29.470	9	225.981
11/32	.316	1-11/16	7.604	3-3/8	31.756	9-1/2	251.379
3/8	.376	1-3/4	8.178	3-7/16	32.941	10	278.129
13/32	.441	1-13/16	8.773	3-1/2	34.128	11	335.685
7/16	.511	1-7/8	9.388	3-5/8	36.824	12	398.651
15/32	.587	1-15/16	10.024	3-3/4	39.375	13	468.698
1/2	.668	2	10.681	4	44.731	14	542.609
9/16	.845	2-1/16	11.879	4-1/4	50.429	15	621.928
5/8	1.043	2-1/8	12.607	4-1/2	56.468	16	708.669
11/16	1.262	2-3/16	13.357	4-3/4	63.166	18	884.603
3/4	1.502	2-1/4	14.117	5	69.905	20	1102.171
13/16	1.763	2-5/16	14.910	5-1/4	76.985	22	1331.376
7/8	2.044	2-3/8	15.712	5-1/2	83.074	24	1582.217
15/16	2.347	2-7/16	16.549	5-3/4	93.289		
1	2.670	2-1/2	17.393	6	100.428		
1-1/16	3.014	2-9/16	18.431	6-1/4	108.837		

Available in Ground & Polished -- (+/-.0005)

Stainless Half-Rounds

Type 304

Width (inches)	Height (inches)	Weight (lbs./ft.)
1/2	1/4	0.334
5/8	5/16	0.520
3/4	3/8	0.751

Stainless Squares

Annealed & Cold Drawn

Standard Lengths: 12 foot random

AISI	303	304/304L	316L	416	17-4	420

Size (inches)	Weight (lbs./ft.)	Weight (lbs./12 ft.)
1/8	.054	.64
3/16	.120	1.44
1/4	.213	2.55
5/16	.332	3.98
3/8	.480	5.76
7/16	.666	7.99
1/2	.850	10.20
9/16	1.076	12.91
5/8	1.330	15.96
3/4	1.910	22.92
7/8	2.600	31.20

Size (inches)	Weight (lbs./ft.)	Weight (lbs./12 ft.)
1	3.400	40.80
1-1/8	4.303	51.63
1-1/4	5.310	63.72
1-1/2	7.650	91.80
1-3/4	10.410	124.92
2	13.600	163.20
2-1/2	21.250	255.00
3	31.030	372.36
3-1/2	42.740	512.88
4	54.450	653.40
5	85.000	1020.00

Note: Squares 2-1/2" and under are typically CF products. All squares over 2-1/2" are HRAP products.

Stainless Hexagons

Annealed & Cold Drawn

Standard Lengths: 12 foot random

AISI	303	304/304L	316L	416

Size (inches)	Weight (lbs./ft.)	Weight (lbs./12 ft.)
1/8	.046	.56
3/16	.104	1.24
1/4	.184	2.21
5/16	.288	3.45
3/8	.414	4.97
7/16	.564	6.77
1/2	.736	8.83
9/16	.932	11.18
5/8	1.150	13.80
11/16	1.393	16.72
3/4	1.660	19.92
13/16	1.940	23.28
7/8	2.250	27.00
15/16	2.590	31.08
1	2.950	35.40
1-1/16	3.324	39.89

Size (inches)	Weight (lbs./ft.)	Weight (lbs./12 ft.)
1-1/8	3.730	44.76
1-3/16	4.152	49.82
1-1/4	4.600	55.20
1-5/16	5.080	60.96
1-3/8	5.570	66.84
1-1/2	6.630	79.56
1-5/8	7.775	93.24
1-3/4	9.026	108.31
1-7/8	10.360	124.32
2	11.780	141.36
2-1/4	14.920	179.04
2-3/8	16.610	199.32
2-1/2	18.400	220.80
2-3/4	22.290	267.41
3	26.530	318.36

Stainless Flats

Hot Rolled Annealed, Pickled, True Mill Bar, Cold Drawn (303 only), Processed Plate Flat*, or Sheared and Edged

Standard Lengths: 12 foot

AISI	303	304/304L	316L	17-4	17-4 H1150	420

"L" grade sizes available upon request.

Size (inches)		Wgt. (lbs./ft.)
1/8 x	3/4	.326
	1	.435
	1-1/4	.544
	1-1/2	.653
	1-3/4	.761
	2	.870
	2-1/2	1.090
	3	1.310
	3-1/2	1.489
	4	1.740
	6	2.610
3/16 x	3/4	.489
	1	.653
	1-1/4	.816
	1-1/2	.979
	1-3/4	1.150
	2	1.305
	2-1/2	1.630
	3	1.960
	3-1/2	2.160
	4	2.610
	5	3.260
	6	3.910
1/4 x	3/4	.638
	1	.870
	1-1/4	1.088
	1-1/2	1.305
	1-3/4	1.488
	2	1.740
	2-1/4	1.913
	2-1/2	2.175
	3	2.610
	3-1/2	3.045
	4	3.480
	4-1/2	3.915
	5	4.350
	6	5.220
	8	6.960
5/16 x	1	1.088
	2	2.291

Size (inches)		Wgt. (lbs./ft.)
3/8 x	1/2	.653
	3/4	.979
	1	1.305
	1-1/8	1.468
	1-1/4	1.630
	1-1/2	1.956
	1-3/4	2.284
	2	2.550
	2-1/2	3.263
	3	3.915
	3-1/2	4.800
	4	5.220
	5	6.505
	6	7.830
	8	10.440
1/2 x	3/4	1.305
	1	1.740
	1-1/4	2.175
	1-1/2	2.610
	1-3/4	2.975
	2	3.480
	2-1/2	4.350
	3	5.220
	3-1/2	6.090
	4	6.960
	5	8.700
	6	10.440
	8	13.420
5/8 x	3/4	1.631
	1	2.130
	1-1/4	2.656
	1-1/2	3.188
	2	4.250
	2-1/2	5.313
	3	6.380
	3-1/2	7.438
	4	8.500
	5	11.183
	6	13.419

Size (inches)		Wgt. (lbs./ft.)
3/4 x	1	2.550
	1-1/4	3.190
	1-1/2	3.830
	1-3/4	4.88
	2	5.100
	2-1/2	6.380
	3	7.650
	3-1/2	8.930
	4	10.200
	5	12.750
	6	15.300
1x	1-1/4	4.250
	1-12	5.100
	1-3/4	6.000
	2	6.800
	2-1/2	8.500
	3	10.200
	3-1/2	11.900
	4	13.600
	5	17.000
	6	20.400
1-1/4 x	1-1/2	6.490
	2	8.500
	2-1/2	10.630
	3	12.750
	4	17.670
	6	25.520
1-1/2 x	2	10.200
	2-1/2	13.196
	3	15.300
	4	20.400
	6	30.600
2 x	2-1/2	17.000
	3	20.400
	4	27.200
3 x	4	40.800

** Weight per foot on Processed Plate Flats slightly higher and specifications would be plate specifications.*

Stainless Sheet

Cold Rolled, Annealed & Pickled Finishes:

- 2B Paper Interleaved
- 2B Laser Film, 1 Side
- #4 Laser Film, 1 Side
- BA Laser Film, 1 Side
- #8 Laser Film, 1 Side

AISI	201	304	304L	316L

Gauge (nom. dec.)	Sheet Size (inches)	Weight (lbs./sqft.)	Approx. Sheet Wgt. (lbs.)
7 ga (.1874)	48 x 96	7.871	251.87
	48 x 120	7.871	314.80
	48 x 144	7.871	377.80
	60 x 96	7.871	314.84
	60 x 120	7.871	393.55
	60 x 144	7.871	472.26
	72 x 96	7.871	377.80
	72 x 120	7.871	472.26
	72 x 144	7.871	566.71
8 ga (.1644)	48 x 96	7.014	224.44
	48 x 120	7.014	280.56
	60 x 120	7.014	350.70
	60 x 144	7.014	420.84
10 ga (.1350)	36 x 96	5.670	136.08
	36 x 120	5.670	170.10
	48 x 96	5.670	181.44
	48 x 120	5.670	226.80
	48 x 144	5.670	272.16
	60 x 96	5.670	226.80
	60 x 120	5.670	283.50
	60 x 144	5.670	340.20
	72 x 96	5.670	272.16
	72 x 120	5.670	340.20
	72 x 144	5.670	408.24
11 ga (.1200)	36 x 96	5.050	121.20
	36 x 120	5.050	151.50
	36 x 144	5.050	181.80
	48 x 96	5.050	161.60
	48 x 120	5.050	202.00
	48 x 144	5.050	242.40
	60 x 96	5.050	202.00
	60 x 120	5.050	252.50
	60 x 144	5.050	303.00
	72 x 96	5.050	242.40
	72 x 120	5.050	303.00
	72 x 144	5.050	363.60

Gauge (nom. dec.)	Sheet Size (inches)	Weight (lbs./sqft.)	Approx. Sheet Wgt. (lbs.)
12 ga (.1054)	36 x 96	4.420	106.08
	36 x 120	4.420	132.60
	36 x 144	4.420	159.12
	48 x 96	4.420	141.44
	48 x 120	4.420	176.80
	48 x 144	4.420	212.16
	60 x 96	4.420	176.80
12 ga (.1054)	60 x 120	4.420	221.00
	60 x 144	4.420	265.20
	72 x 96	4.420	272.16
	72 x 120	4.420	265.20
	72 x 144	4.420	318.24
13 ga (.0900)	48 x 96	3.780	120.96
	48 x 120	3.780	151.20
	48 x 144	3.780	181.44
14 ga (.075)	36 x 96	3.155	75.72
	36 x 120	3.155	94.65
	36 x 144	3.155	113.58
	48 x 96	3.155	100.96
	48 x 120	3.155	126.20
	48 x 144	3.155	151.44
	60 x 96	3.155	126.20
	60 x 120	3.155	157.75
	60 x 144	3.155	189.30
	72 x 96	3.155	151.44
	72 x 120	3.155	189.30
	72 x 144	3.155	227.16
16 ga (.060)	36 x 96	2.520	60.48
	36 x 120	2.520	75.60
	36 x 144	2.520	90.72
	48 x 96	2.520	80.64
	48 x 120	2.520	100.80
	48 x 144	2.520	120.96
	60 x 96	2.520	100.80
	60 x 120	2.520	126.00
	60 x 144	2.520	151.20
	72 x 96	2.520	120.96
	72 x 120	2.520	151.20
	72 x 144	2.520	181.44

Special length sheets available by request, please inquire with your Alro sales representative.

***Note: Laser Film is dual purpose fiber optic / CO2 laser film.**

Continued on next page

Stainless Sheet

Cold Rolled, Annealed and Pickled Finishes:

- 2B Paper Interleaved
- 2B Laser Film, 1 Side
- #4 Laser Film, 1 Side
- BA Laser Film, 1 Side
- #8 Laser Film, 1 Side

AISI	201	304	304L	316L

Gauge (nom. dec.)	Sheet Size (inches)	Weight (lbs./sqft.)	Approx. Sheet Wgt. (lbs.)
18 ga (.048)	36 x 96	2.020	48.48
	36 x 120	2.020	60.60
	36 x 144	2.020	72.72
	48 x 96	2.020	64.64
	48 x 120	2.020	80.80
	48 x 144	2.020	96.96
	60 x 96	2.020	80.80
	60 x 120	2.020	101.00
	60 x 144	2.020	121.20
20 ga (.036)	36 x 96	1.512	36.28
	36 x 120	1.512	45.36
	36 x 144	1.512	54.43
	48 x 96	1.512	48.38
	48 x 120	1.512	60.48
	48 x 144	1.512	72.57
	60 x 96	1.512	60.48
	60 x 120	1.512	75.60
	60 x 144	1.512	90.72

Gauge (nom. dec.)	Sheet Size (inches)	Weight (lbs./sqft.)	Approx. Sheet Wgt. (lbs.)
22 ga (.030)	36 x 96	1.260	30.24
	36 x 120	1.260	37.80
	36 x 144	1.260	45.36
	48 x 96	1.260	40.32
	48 x 120	1.260	50.40
	48 x 144	1.260	60.48
	60 x 96	1.260	50.40
	60 x 120	1.260	63.00
24 ga (.024)	36 x 96	1.008	24.19
	36 x 120	1.008	30.24
	48 x 96	1.008	32.25
	48 x 120	1.008	40.32
	48 x 144	1.008	48.38
26 ga (.018)	36 x 96	.756	18.14
	36 x 120	.756	22.68
	48 x 96	.756	24.19
	48 x 120	.756	30.24
	48 x 144	.756	36.29

Special length sheets available by request, please inquire with your Alro sales representative.

Note: Laser Film is dual purpose fiber optic / CO2 laser film.

Stainless Sheet

Cold Rolled, Annealed and Pickled Finishes:

- 2B Paper Interleaved
- 2B Laser Film, 1 Side
- #4 Laser Film, 1 Side
- BA Laser Film, 1 Side
- #8 Laser Film, 1 Side

AISI	409-2D	430	439-2D

Gauge (Nominal Decimal)	Sheet Size (inches)	Weight (lbs./sqft.)	Approx. Weight (lbs./sheet)
24 ga (.024)	48 x 96	1.008	32.25
	48 x 120	1.008	40.32
22 ga (.030)	48 x 96	1.260	40.32
	48 x 120	1.260	50.40
20 ga (.036)	48 x 96	1.512	48.38
	48 x 120	1.512	60.48
18 ga (.048)	48 x 96	2.020	64.64
	48 x 120	2.020	80.80
16 ga (.060)	48 x 96	2.520	80.64
	48 x 120	2.520	100.80
14 ga (.075)	48 x 96	3.155	100.96
	48 x 120	3.155	126.20
12 ga (.1054)	48 x 96	4.420	141.44
	48 x 120	4.420	176.80
11 ga (.1200)	48 x 96	5.050	161.60
	48 x 120	5.050	202.00

Note: Laser Film is dual purpose fiber optic / CO2 laser film.

Stainless Plate

Hot Rolled, Annealed & Pickled

AISI	201	304	304L	316L
ASTM	A240	A240	A240	A240

Thickness (inches) (lbs./sqft.)	Width (inches)
3/16 (8.579)	48 60 72 96
3/16 (304L only)	78.74
1/4 (11.162)	48 60 72 96
1/4 (304L only)	78.74
5/16 (13.746)	48 60 72 96
3/8 (16.496)	48 60 72 96
1/2 (21.663)	48 60 72 96
5/8 (26.831)	48 60 72 96
3/4 (32.123)	48 60 96
7/8 (37.290)	60 96

Thickness (inches) (lbs./sqft.)	Width (inches)
1 (43.013)	48 60 96
1-1/4 (53.453)	60 96
1-1/2 (63.893)	60 96
1-3/4 (74.333)	60 96
2 (85.921)	60 96
2-1/4 (96.361)	60 96
2-1/2 (106.801)	60 96
2-3/4 (117.241)	60 96
3 (128.725)	60 96
3-1/2 (149.605)	60 96
4 (172.051)	60 96
5 (213.811)	60 72
6 (255.571)	60 72

Stainless 304L 2B Plate

Hot Rolled, Annealed & Pickled

- 2B with Laser Film, 1 Side
- #4 Polished with Laser Film, 1 Side

AISI	304L

Thickness (nominal dec.)	Plate Size (inches)	Weight (lbs./sqft.)	Approx. Sheet Wgt. (lbs.)
1/4" (.250)	48 x 96	11.162	357.184
	48 x 120	11.162	446.480
	48 x 144	11.162	535.776
1/4"	60 x 120	11.162	558.100
	60 x 144	11.162	669.720
1/4"	72 x 120	11.162	669.720
	72 x 144	11.162	803.664

Note: Laser Film is dual purpose fiber optic / CO2 laser film.

Stainless Tread Plate

Hot Rolled, Annealed & Pickled

AISI	304
ASTM	A793 Pattern B

Thickness (Inches)	Width (inches)
1/8	48 60
3/16	48 60

Thickness (Inches)	Width (inches)
1/4	48 60
3/8	48 60

Stainless Angle

Hot Rolled, Annealed & Pickled

20 - 24 foot Random Lengths

AISI	304	304L	316L
ASTM	A276	A276	A276
FEDERAL	QQS-763		

Size (inches)	Weight (lbs./ft.)
3/4 x 3/4 x 1/8	.592
1 x 1 x 1/8	.807
1 x 1 x 3/16	1.171
1 x 1 x 1/4	1.507
1-1/4 x 1-1/4 x 1/8	1.023
1-1/4 x 1-1/4 x 3/16	1.494
1-1/4 x 1-1/4 x 1/4	1.938
1-1/2 x 1-1/2 x 1/8	1.238
1-1/2 x 1-1/2 x 3/16	1.817
1-1/2 x 1-1/2 x 1/4	2.369
2 x 2 x 1/8	1.669
2 x 2 x 3/16	2.463
2 x 2 x 1/4	3.230
2 x 2 x 3/8	4.683
2-1/2 x 2-1/2 x 3/16	3.109
2-1/2 x 2-1/2 x 1/4	4.091
2-1/2 x 2-1/2 x 3/8	5.975

Size (inches)	Weight (lbs./ft.)
3 x 2 x 3/16	3.070
3 x 2 x 1/4	4.100
3 x 3 x 3/16	3.710
3 x 3 x 1/4	4.952
3 x 3 x 3/8	7.267
3 x 3 x 1/2	9.474
3-1/2 x 3-1/2 x 1/4	5.800
3-1/2 x 3-1/2 x 3/8	8.650
4 x 3 x 1/4	5.800
4 x 3 x 3/8	8.500
4 x 4 x 1/4	6.675
4 x 4 x 3/8	9.851
4 x 4 x 1/2	12.920
5 x 3 x 3/8	9.850
5 x 5 x 1/4	8.895
5 x 5 x 3/8	12.802
6 x 4 x 3/8	12.300
6 x 6 x 1/4	10.755
6 x 6 x 3/8	15.551

Stainless Channel

Type 304/304L, Rolled or Extruded

20 foot Random Lengths

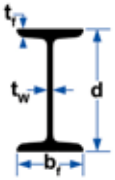
ASTM	A276
ASME	A279
FEDERAL	QQS-763

Size (inches)	Weight (lbs./ft.)
1-1/2 x 3/4 x 1/8	1.200
2 x 1 x 3/16	2.650
2 x 1 x 1/4	3.080
3 x 1-3/8 x 3/16	3.533
3 x 1-1/2 x 3/16	3.703
3 x 1-1/2 x 1/4	4.784

Size (inches)	Weight (lbs./ft.)
4 x 1-3/4 x 1/4	6.055
4 x 2 x 1/4	6.484
5 x 2-1/2 x 1/4	8.200
6 x 1.90 x .343	8.300
6 x 3 x 1/4	10.140
8 x 4 x 3/8	20.000

Stainless Beams

Type 304/304L - 20 foot Random Lengths
ASTM A276, ASME A279, Federal QQS-763



Shape	Web		Flange	
	d (inches)	t_w (inches)	b_f (inches)	t_f (inches)
HR S 3 x 5.7	3.00	.170	2.330	.260
HR S 4 x 7.7	4.00	.193	2.663	.293
HR S 6 x 12.5	6.00	.232	3.332	.359

Laser Fused	d (inches)	t_w (inches)	b_f (inches)	t_f (inches)
LC W 6 x 12	6.03	.230	4.000	.280
LC W 6 x 15	5.99	.230	5.990	.260
LC W 6 x 20	6.20	.260	6.020	.365
LC W 8 x 15	8.11	.245	4.015	.315
LC W 8 x 18	8.14	.230	5.250	.330
LC W 8 x 31	8.00	.285	7.995	.435

Stainless Ornamental Tubing

Type 304 Welded, Type 316L - 20 foot Random Lengths
ASTM: A-554 (Polished finish available upon request)

Squares & Rectangles

Outside Dimension and Gauge	Wall (inches)	Weight (lbs./ft.)
1/2" x 1/2"		
16	.062	.389
5/8" x 5/8"		
16	.062	.510
3/4" x 3/4"		
18	.049	.469
16	.062	.610
14	.083	.763
11	.120	1.020
1" x 1"		
18	.049	.630
16	.062	.827
14	.083	1.035
11	.120	1.440
1-1/4" x 1-1/4"		
18	.049	.790
16	.062	1.048
14	.083	1.317
11	.120	1.844
7	.180	2.620

Outside Dimension and Gauge	Wall (inches)	Weight (lbs./ft.)
1-1/2" x 1-1/2"		
18	.049	0.970
16	.062	1.268
14	.083	1.610
11	.120	2.252
7	.180	3.630
1/4	.250	4.067
1-3/4" x 1-3/4"		
11	.120	2.660
2" x 2"		
16	.062	1.710
14	.083	2.140
11	.120	3.050
7	.180	4.320
1/4	.250	6.010
2-1/2" x 2-1/2"		
11	.120	3.880
7	.180	5.680
1/4	.250	7.343

Continued on next page

Stainless Ornamental Tubing

Type 304 Welded, Type 316L - 20 foot Random Lengths
ASTM: A-554 (Polished finish available upon request)

Squares & Rectangles

Outside Dimension and Gauge	Wall (inches)	Weight (lbs./ft.)
3" x 3"		
14	.083	3.290
11	.120	4.970
7	.180	6.900
1/4	.250	9.350
3-1/2"x 3-1/2"		
1/4	.250	11.015
4" x 4"		
11	.120	6.450
7	.180	9.410
1/4	.250	12.680
3/8	.375	18.485
5" x 5"		
7	.180	11.799
1/4	.250	16.150
3/8	.375	23.588
6" x 6"		
7	.180	14.247
1/4	.250	18.770
3/8	.375	28.688
8" x 8"		
1/4	.250	26.350
3/8	.375	38.888
1" x 1/2"		
16	.062	.606
1-1/2"x 1/2"		
16	.062	.830
1-1/2"x 3/4"		
16	.062	.990
1-1/2"x 1"		
16	.062	1.048
11	.120	1.884
2" x 1"		
16	.062	1.269
11	.120	2.252
2" x 1-1/2"		
11	.120	2.660
3 x 1		
11	.120	3.070

Outside Dimension and Gauge	Wall (inches)	Weight (lbs./ft.)
3" x 1-1/2"		
14	.083	3.030
11	.120	3.480
7	.180	4.960
3" x 2"		
11	.120	3.884
7	.180	5.679
1/4	.250	7.100
4" x 2"		
11	.120	4.750
7	.180	6.903
1/4	.250	9.350
4" x 3"		
11	.120	5.516
7	.180	8.130
1/4	.250	11.024
5" x 3"		
1/4	.250	12.683
6" x 2"		
7	.180	9.270
1/4	.250	12.680
6" x 3"		
7	.180	10.520
1/4	.250	13.730
6" x 4"		
7	.180	11.900
1/4	.250	16.350
8" x 2"		
7	.180	11.900
1/4	.250	18.270
8" x 4"		
1/4	.250	18.770
3/8	.375	28.688
8" x 6"		
1/4	.250	22.910
10" x 2"		
1/4	.250	18.770

Stainless Round Tube

Type 304 Welded, Type 316L Welded, 409 Welded
ASTM A554, Seamless ASTM A269 - 20 foot Random Lengths

AISI	304	316L	409

O.D. (inches)	Wall (inches)	Weight (lbs./ft.)
1/4	.028	.066
1/4	.035	.080
1/4	.049	.105
1/4	.065	.129
1/4	.083	.148
5/16	.028	.086
5/16	.049	.139
5/16	.065	.172
3/8	.028	.104
3/8	.035	.127
3/8	.049	.171
3/8	.065	.215
3/8	.083	.220
1/2	.035	.174
1/2	.049	.236
1/2	.065	.302
1/2	.083	.370
1/2	.095	.411
1/2	.120	.487
5/8	.035	.221
5/8	.049	.301
5/8	.065	.389
5/8	.120	.647
3/4	.035	.267
3/4	.049	.367
3/4	.065	.476
3/4	.083	.591
3/4	.120	.807
3/4	.188	.850
7/8	.049	.432
7/8	.065	.562
7/8	.120	.968
1	.035	.361
1	.049	.498
1	.065	.649
1	.083	.813
1	.120	1.128
1	.188	1.630
1	.250	2.004

O.D. (inches)	Wall (inches)	Weight (lbs./ft.)
1-1/4	.049	.629
1-1/4	.065	.823
1-1/4	.083	1.034
1-1/4	.120	1.467
1-1/4	.188	2.132
1-1/4	.250	2.670
1-1/2	.049	.759
1-1/2	.065	.996
1-1/2	.083	1.257
1-1/2	.120	1.770
1-1/2	.188	2.634
1-1/2	.250	3.338
1-5/8	.065	1.083
1-3/4	.065	1.170
1-3/4	.120	2.089
1-3/4	.188	3.136
1-3/4	.250	4.005
2	.049	1.021
2	.056	1.204
2	.065	1.343
2	.071	1.498
2	.120	2.409
2	.188	3.670
2	.250	4.673
2	.375	6.508
2-1/4	.056	1.359
2-1/4	.065	1.530
2-1/4	.071	1.692
2-1/4	.120	2.730
2-1/4	.188	4.140
2-1/4	.250	5.340
2-1/4	.375	7.509
2-1/2	.056	1.514
2-1/2	.065	1.683
2-1/2	.071	1.887
2-1/2	.120	3.050
3	.056	1.824
3	.065	2.030
3	.071	2.276
3	.120	3.691
4	.065	2.732

Stainless Welded Pipe

20 foot Random Lengths

AISI	304	316L
ASTM	A312	A312

Nominal Pipe Size	O.D. (inches)	I.D. (inches)	Wall Thickness	Weight (lbs./foot)
Schedule 10				
1/2	.840	.674	.083	.671
3/4	1.050	.884	.083	.857
1	1.315	1.097	.109	1.420
1-1/4	1.660	1.442	.109	1.806
1-1/2	1.900	1.682	.109	2.080
2	2.375	2.157	.109	2.638
2-1/2	2.875	2.635	.120	3.530
3	3.500	3.260	.120	4.332
4	4.500	4.260	.120	5.610
5	5.563	5.295	.134	7.840
6	6.625	6.357	.134	9.290
8	8.625	8.329	.148	13.400
10	10.750	10.420	.165	18.650
Schedule 40				
1/8	.405	.269	.068	.240
1/4	.540	.364	.088	.420
3/8	.675	.493	.091	.570
1/2	.840	.622	.109	.851
3/4	1.050	.824	.113	1.131
1	1.315	1.049	.133	1.680
1-1/4	1.660	1.380	.140	2.270
1-1/2	1.900	1.610	.145	2.720
2	2.375	2.067	.154	3.650
2-1/2	2.875	2.469	.203	5.850
3	3.500	3.068	.216	7.580
3-1/2	4.000	3.548	.226	9.110
4	4.500	4.026	.237	10.790
5	5.563	5.047	.258	14.620
6	6.625	6.065	.280	18.970
8	8.625	7.981	.322	28.550
10	10.750	10.020	.365	40.480
Schedule 80				
1/4	.540	.302	.119	.540
3/8	.675	.423	.126	.730
1/2	.840	.546	.147	1.090
3/4	1.050	.742	.154	1.470
1	1.315	.957	.179	2.170
1-1/4	1.660	1.278	.191	3.030
1-1/2	1.900	1.500	.200	3.630
2	2.375	1.939	.218	5.070
2-1/2	2.875	2.323	.276	7.660
3	3.500	2.900	.300	10.250
4	4.500	3.826	.337	14.980

Stainless Bar Tolerances

Rounds, Cold Finished (CF)

Drawn, Turned or Centerless Ground

Specified Size (inches)	Over (inches)	Under (inches)
1/16 to 5/16, excl.	0.0010	0.0010
5/16 to 1/2, excl.	0.0015	0.0015
1/2 to 1, excl.	0.0020	0.0020
1 to 1-1/2, excl.	0.0025	0.0025
1-1/2 to 3-1/4, incl.	0.0030	0.0030
3-1/4 to 4, incl.	0.0050	0.0050

Unless otherwise specified, size tolerances are over and under as shown in the above table. When required, however, they may be specified all over and nothing under, or all under and nothing over, or any combination of over and under, if the total spread in size tolerance for a specified is not less than the total spead shown in the table.

When it is necessary to heat treat or heat treat and pickle after cold finishing, size tolerances are double those shown in the table.

Cold-finished bars over 4 inch in diameter are produced; size tolerances for such bars are not included herein.

Rounds, Rough Turned (RT)

Specified Size (inches)	Over (inches)	Under (inches)
>2 to 2-1/2	0.031	0.000
>2-1/2 to 3-1/2	0.046	0.000
>3-1/2 to 4-1/2	0.062	0.000
>4-1/2 to 5-1/2	0.078	0.000
>5-1/2 to 6-1/2	0.125	0.000
>6-1/2 to 8	0.156	0.000
>8 to 12	0.187	0.000
>12 and up	0.218	0.000

Stainless Rounds Straightness Tolerances

Hot Rolled	Cold Finished
1/8" in any 5 foot section of the bar	1/16" in any 5 foot section of the bar

Stainless Hex and Squares

Specified Size (inches)	Over (inches)	Under (inches)	Finish
1/8 to 5/16	0.000	0.002	Cold Finished
5/16 to 1/2	0.000	0.003	Cold Finished
1/2 to 1	0.000	0.004	Cold Finished
> 1 to 2	0.000	0.006	Cold Finished
> 2 to 3	0.000	0.008	Cold Finished
> 3 to < 3-1/2	0.000	0.010	Cold Finished
3-1/2 to 4*	0.100	0.100	Forged
4 to 4-1/2*	0.100	0.100	Forged
4-1/2 to 6*	0.100	0.100	Forged
6 to 6-3/8*	0.100	0.100	Forged
6-3/8 to 6-5/8*	0.100	0.100	Forged
6-5/8 and Over*	0.100	0.100	Forged

* Forged HRAP Square Bars over 3-1/2" square - Billets and other semi-finished material shall conform to shape and dimensions specified by the purchaser within a permitted variation of +/-5%.

Stainless Ground Bar Tolerances

Abbreviation	Description	Tolerance	Microfinish	Straightness
CG	Centerless Ground	+/- Tolerance by size	45 RMS	.008" TIR/FT
G&P	Ground & Polished	+/-.0005"	32/20 RMS	.006" TIR/FT
PG	Precision Ground	+0/-.0005"	16 RMS	.006" TIR/FT
TG&P Stainless	Turned Ground & Polished	+/-.0005"	32 RMS	.006" TIR/FT
RT	Rough Turned	+.032/-0"	125 RMS	.012" TIR/FT
	STN	Straightened	---	.008/.006" TIR/FT
P STN	Precision Straightened	---	---	.004" TIR/FT
BSQ	Bearing Shaft Quality	-.0005/-.0015"	32 RMS	.006" TIR/FT
PSQ -.500"-<1.500"	Pump Shaft Quality	+0/-.0015"	32/25 RMS	.0015" TIR/FT
PSQ -1.500"-4.000"	Pump Shaft Quality	+0/-.002"	32/25 RMS	.0015" TIR/FT
PSQ ->4.000"-5.000"	Pump Shaft Quality	+0/-.003"	32/25 RMS	.0015" TIR/FT

Stainless Sheet Thickness Tolerances

Gauge	Nominal Decimal	Tolerance Plus/Minus
7	.1874	.007
8	.1650	.007
10	.1350	.006
11	.1200	.005
12	.1054	.005
13	.0900	.004
14	.0751	.004
16	.0595	.003
18	.0480	.003
19	.0420	.003
20	.0355	.002
22	.0293	.002
24	.0235	.0015
26	.0178	.0015
28	.0151	.0015

Stainless Sheet Tolerances

Flatness, Stretcher Level Flatness

Thickness (inches)	Width (inches)	Length (inches)	Flatness Tolerances
under 3/16	thru 48	up to 96	1/8
under 3/16	thru 48	over 96	1/4
under 3/16	over 48	thru 96	1/4
under 3/16	over 48	over 96	1/4

***Note:** Flatness is defined as maximum deviation from a horizontal flat surface.*

Stainless Plate Tolerances

Thickness Tolerance for Stainless and Heat Resisting Steels

Specified Thickness (inches)	Width (inches)	
	Thru 84	Over 84 thru 120
3/16 up to 3/8	+.045 / –.010	+.050 / –.010
3/8 up to 3/4	+.055 / –.010	+.060 / –.010
3/4 up to 1	+.060 / –.010	+.065 / –.010
1 up to 2	+.070 / –.010	+.075 / –.010
2 up to 3	+.125 / –.010	+.150 / –.010
3 up to 4	+.175 / –.010	+.210 / –.010
4 up to 6	+.250 / –.010	+.300 / –.010
6 up to 8	+.350 / –.010	+.420 / –.010
8 thru 10	+.450 / –.010	+.540 / –.010

Flatness Tolerance for Annealed Stainless and Heat Resisting Steel Plate

Specified Thickness (inches)	Flatness Tolerance for Thickness & Widths				
	Widths (inches)				
	Up thru 48	Over 48 up to 60	60 up thru 72	72 up thru 84	84 up thru 96
3/16 up to 1/4	3/4	1-1/16	1-1/4	1-3/8	1-5/8
1/4 up to 3/8	11/16	3/4	15/16	1-1/8	1-3/8
3/8 up to 1/2	1/2	9/16	11/16	3/4	15/16
1/2 up to 3/4	1/2	9/16	5/8	5/8	13/16
3/4 up to 1	1/2	9/16	5/8	5/8	3/4
1 up to 1-1/2	1/2	9/16	9/16	9/16	11/16
1-1/2 up to 4	3/16	5/16	3/8	7/16	1/2
4 thru 6	1/4	3/8	1/2	9/16	5/8

***Note:** Flatness is defined as maximum deviation from a horizontal flat surface.*

Stainless Flats Tolerances

Sheared and Edged Flats

Order Thickness (inches)	Permitted Variation in Thickness (inches)		Permitted Variation in Width (inches)			
	Over	Under	Width up to 4"		Widths Over 4"	
			Over	Under	Over	Under
1/8 Over 0.114 to 0.130	0.010	0.010	0.094	0.031	0.094	0.094
3/16 - 3/8	0.050	0.010	0.094	0.031	0.094	0.094
3/8 - 3/4	0.060	0.010	0.094	0.031	0.094	0.094

True Bar Flats

True Bar	Permitted Variations in Thickness for Thicknesses Given (inches)			Permitted Variations in Width Tolerance (inches)	
Width (inches)	1/8 thru 1/2	Over 1/2 thru 1	Over 1 thru 2	Over	Under
Up thru 1	+/-.008	+/-.010	—	.015	.015
Over 1 thru 2	+/-.012	+/-.015	+/-.031	.031	.031
Over 2 thru 4	+/-.015	+/-.020	+/-.031	.062	.031
Over 4 thru 6	+/-.015	+/-.020	+/-.031	.093	.062
Over 6 thru 8	+/-.016	+/-.025	+/-.031	.125	.156
Over 8 thru 10	+/-.021	+/-.031	+/-.031	.156	.187

True Bar Straightness Tolerances

Hot Rolled	Cold Finished
1/8" in any 5 foot section of the bar	1/16" in any 5 foot section of the bar

Note: Straightness tolerances have not been established for sizes less than 1/2".

Stainless Angle Tolerances

Leg Tolerance (Length)	+/- 1/8"
Weight Tolerance	+/- 7.5%
Right Angle Tolerance	+/- 2°
Straightness or Camber	1/8" in 5'

Stainless Channel Tolerances

Section (Leg Tolerance)

Under 1" (Total)..... 0.040
1" - 3" incl..... 0.062
3" - 4" incl..... 0.093
Over 4"..... 0.125

Angular +/-2"

Corner Radii 1/4" or less

Leg Radii 1/4" or less

Transverse Flatness

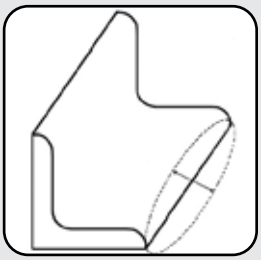
.010" per inch of width, .050" max.

Length

Up to 12' incl.	
To 3" wide section	
Over 3" to 6" incl.	+ 3/16 / - 0
Over 6"	+ 1/4 / - 0
Over 12'	
To 3" wide section	+ 3/16 / - 0
Over 3" to 6" incl.	+ 1/4 / - 0
Over 6"	+ 5/16 / - 0

Camber

Camber or bow tolerances shall not exceed 0.025 in. [0.60mm] x length in ft. [$^{m}/_{3}$]



Twist

Width of Section	Rise in 5 ft.
1/2" to 1-1/2" incl.	.125"
Over 1-1/2" to 4" incl.	.188"
Over 4"	.250"

Stainless Round Tube Tolerances

Nominal Round (inches)	Wall Thickness (inches)	Outside Dia. Tolerance (inches)	Wall Tolerance (percent)
5/8 to 1 incl	0.035 to 0.062	+ or - 0.005	+ or - 10%
5/8 to 1 incl	Over 0.062	+ or - 0.010	+ or - 10%
Over 1 to 1-1/2 incl	0.035 to 0.062	+ or - 0.008	+ or - 10%
Over 1 to 1-1/2 incl	Over 0.062	+ or - 0.010	+ or - 10%
Over 1 to 2-1/2 incl	Over 0.035	+ or - 0.012	+ or - 10%
Over 2-1/2 to 3-1/2 incl	Over 0.049	+ or - 0.020	+ or - 10%
Over 3-1/2 to 5 incl	Over 0.049	+ or - 0.025	+ or - 10%
Over 5	Over 0.083	+ or - 0.030	+ or - 10%

Stainless Square & Rectangular Tube Tolerances

Largest Nominal Outside Diameter (inches)	O.D. Tolerance Concavity or Convexity (inches)	Wall Tolerance (percent)
To 1-1/4 incl.	+ or - 0.015	+ or - 10%
Over 1-1/4 to 2-1/2 incl.	+ or - 0.020	+ or - 10%
Over 2-1/2 to 5-1/2 incl.	+ or - 0.030	+ or - 10%
Over 5-1/2	+ or - 0.060	+ or - 10%