

AUSTENITIC STAINLESS STEELS

WHAT ARE AUSTENITIC STAINLESS STEELS?

Austenitic stainless steels are characterized by their high nickel and chromium content. This contributes greatly to their formability, corrosion and wear resistance against the elements of nature.

Originally, austenitic stainless steel started off in 1940s with the development of the 200 series stainless steel with a higher Nitrogen content but with a lower Nickel due to the high cost back then. Fast forwarding to the present, the most common grade of Austenitic stainless steel now is the 300 series stainless steel such as grade 304 and 316 which are the two most popular grades world-wide.

SS 304/304L (UNS S30400 / S30403)

Stainless Steel 304 is also commonly known as 18/8 or in short for 18% Chromium and 8% Nickel. This is currently the most popular grade of stainless steel due to its excellent formability, corrosion and wear resistance.

KEY PROPERTIES (Annealed)

Yield Strength	25 KSI Min
Tensile Strength	70 KSI Min
Elongation	40% Min

* Details for hot-finished

SPECIFICATIONS

ASTM A276/A276M
ASTM A479/A479M
NACE MR0103/MR0175/ISO 15156-01

CONDITION

Annealed

Categories	Grades	UNS	Bars	Round Bar Size Range (in mm)	Condition
CHROMIUM STEELS / ALLOY STEELS	304/304L	S30400/ S30403	●	3.18 - 400.00	Annealed
	316/316L	S31600/ S31603	●	3.18 - 508.00	Annealed
	310S	S31008	●	6.00 - 85.00	Annealed
	NITRONIC 50	S20910	●	9.53 - 139.70	Strain Hardened / Cold Work

Typical chemical composition, by % mass					
Chromium	Carbon	Manganese	Nitrogen	Silicon	Nickel
Cr	C	Mn	Si	Fe	Ni
18.00 - 20.00%	0.03% Max	2.00% Max	1.00% Max	8.00 - 12.00%	
Nitrogen	Phosphorus	Sulphur	Iron		
N	P	S	Fe		
0.10% Max	0.045% Max	0.03% Max	Balance		

KEY PROPERTIES (Annealed)

Yield Strength	25 KSI Min
Tensile Strength	70 KSI Min
Elongation	40% Min

* Details for hot-finished

SPECIFICATIONS

ASTM A276/A276M
ASTM A479/A479M
NACE MR0103/MR0175/ISO 15156-01

CONDITION

Annealed

Typical chemical composition, by % mass					
Chromium	Nickel	Molybdenum	Manganese	Silicon	
Cr	Ni	Mo	Mn	Si	
16.00 - 18.00%	10.00 - 14.00%	2.00 - 3.00%	2.00% Max	1.00% Max	
Carbon	Nitrogen	Phosphorus	Sulphur	Iron	
C	N	P	S	Fe	
0.30% Max	0.10% Max	0.045% Max	0.03% Max	Balance	

SS 316/316L (UNS S31600/S31603)

Stainless steel 316 is the 2nd most popular grade after Stainless Steel 304. The key defining difference between the two is the addition of Molybdenum. The addition of Molybdenum greater increases the corrosion resistance of grade 316 materials, hence its widespread use in outdoors and in the marine industry.

KEY PROPERTIES (Annealed)

Yield Strength	30 KSI Min
Tensile Strength	75 KSI Min
Elongation	40% Min

* Details for hot-finished

SPECIFICATIONS

ASTM A276/A276M
ASTM A479/A479M
NACE MR0175/MR0103/A262 PRACTICE E

CONDITION

Annealed

Typical chemical composition, by % mass			
Chromium	Nickel	Manganese	Silicon
Cr	Ni	Mn	Si
24.0 - 26.0%	19.0 - 22.0%	2.00% Max	1.50% Max
Carbon	Phosphorus	Sulphur	Iron
C	P	S	Fe
0.08% Max	0.045% Max	0.03% Max	Balance

SS 310S (UNS S31008)

Stainless Steel 310 is known for its high corrosion resistance and strength in high working temperatures. It has very good oxidation resistance in general and good oxidation resistance in mildly cyclic conditions that is best employed in temperatures up to 1050°C/1920°F.

This is commonly used in heat exchange systems, furnace equipment and other high temperature usage conditions.

KEY PROPERTIES (Annealed)

Yield Strength	1000 MPa Min
Tensile Strength	860 MPa Min
Elongation	12% Min
Hardness	35 HRC Max

SPECIFICATIONS

ASTM A276/A276M
NACE MR0175/ISO 15156 & NACE MR0103

CONDITION

STRAIN-HARDENED (COLD-WORKED)/CENTRELESS GROUND AND SOLUTION ANNEALED/HOT WORKED FOLLOWED BY WARM WORKED TO 35 HRC MAX.

Typical chemical composition, by % mass					
Chromium	Nickel	Manganese	Molybdenum	Silicon	
Cr	Ni	Mn	Mo	Si	
21.5 - 23.5%	11.5 - 13.5%	4.00 - 6.00%	1.50 - 3.00%	1.00% Max	
Nitrogen	Carbon	Phosphorus	Sulphur	Nitrogen + Vanadium	
N	C	P	S	Nb + Ta	
0.20 - 0.40%	0.06% Max	0.045% Max	0.030% Max	0.10 - 0.30%	
Tungsten	Iron				
V	Fe				
0.10 - 0.30%	Balance				

NITRONIC 50 / XM-19 (UNS S20910)

Nitronic 50 / XM-19 is a manganese alloyed austenitic steel with improved corrosion resistance as compared to grade 316L. Due to the increase in chromium content, this puts it at around double the yield strength of 316L at room temperature conditions. Unlike many austenitic alloys, Nitronic 50 is capable of retaining low magnetic permeability even after exposure to sub-zero temperatures or severe cold working conditions. Nitronic 50 has excellent resistance to sulfide stress cracking and intergranular attack.



INTERNAL VIEW OF OUR AUTOMATIC STORAGE AND RETRIEVAL SYSTEM