

GENERAL INFORMATION - STAINLESS STEEL FASTENERS

Because of the stainless steel corrosion and head resistance, stainless steel fasteners are of a significant importance in the industry. Stainless steel fasteners have an almost unlimited span of life even when exposed to humidity or acids.

Stainless comes in three basic classifications: 1. Austenitic (A) 2. Ferritic (F) 3. Martensitic (C). Austenitic type 300 series allows for excellent corrosion resistance and good formability. It comprises over 90% of the commercial fasteners sold worldwide. Ferritic and Martensitic are both 400 series stainless, Martensitic can be heat treated, neither offer the same corrosion protection as Austenitic and fasteners are only available in special order quantities.

STAINLESS STEEL	FREE MACHINING	CORROSION RESISTANT	ACID RESISTANT	SPRING STAINLESS	
GRADE ISO 3506-1979	A 1	A 2	A 4	SX*	
USA GRADE AISI #	303 Se	304	316	400 Series	
GERMANY GRADE DIN #	1.4305	1.4301, 1.4303	1.4401	1.4122	1.4034
GERMANY DESIGNATION (DIN 17006, 17440)	X10CrNiS 18 9	X5CrNi 18 10, X5CrNi 19 12	X5CrNiMo 17 12 2	X35CrMo 17	X46Cr 13
CHEMICAL COMPOSITION (Approx %) [‡]	C 0.12, Si 1.0, Mn, 2.0, P 0.20, S 0.15 - 0.35, Cr 17.0 - 19.0, Mo 0.6, Ni 8.0 - 10.0	C 0.08, Si 1.0, Mn 2.0, P 0.05, S 0.03, Cr 17.0 - 20.0, Ni 8.0 - 13.0	C 0.08, Si 1.0, Mn 2.0, P 0.05, S 0.03, Cr 16.0 - 18.5, Mo 2.0 - 3.0, Ni 10.0 - 14.0	C 0.33 - 0.43, Cr 15.5 - 17.5, Mo 0.9 - 1.3, N ≤ 1.0, Si ≤ 1.0, Mn ≤ 1.0, P ≤ 0.045, S 0.03	C (-0.42) - (-0.50), Si 1.0, Mn 1.0, P 0.045, S 0.03, Cr (-12.5) - (-14.5)
TEXTURE	AUSTENITIC (Not capable of heat treatment)			MARTENSITIC	
ADDITIONAL PROPERTIES	WELDABLE, HEAT RESISTANT, ANTI-MAGNETIC~			HARDENABLE	

~A1 & A2 can be slightly magnetic, A4 must not be magnetic.

* "SX" is not an ISO recognized designation.

[‡]Alternative steels may be used provided that they give the physical and mechanical properties to the required steel grade and property class and have equivalent corrosion resistance. Only then the parts may be marked and/or described according to the designation system below under MARKING. Martensitic stainless steels containing more carbon can be treated. They have a lower corrosion resistance and are also magnetic.

Property Class

Stainless steel strength is accomplished by a work hardening process (wire drawing, heading, thread rolling), not by heat treatment. Work hardening reduces corrosion resistance.

PROPERTY CLASS	MADE FROM	CHARACTERISTICS
Class 50	A1, A2	Soft, cold worked, turned and soft pressed fasteners
Class 70	A2, A4	Cold worked, normal strength, formed fasteners
Class 80	A2, A4	Extreme cold worked, high strength, special application

Tensile Strength for Screws, Bolts and Nuts

(Minimum values at room temperature)

Ref: Iso 3506-1979

GROUP	GRADE	PROPERTY CLASS	DIAMETER RANGE	BOLTS, SCREWS,	NUTS LOAD
AUSTENITIC	A1, A2, A4	50	M 39 and smaller	500 (70,000 PSI)	500
		70	M 20 and smaller	700 (100,000 PSI)	700
		80	M 20 and smaller	800 (118,000 PSI)	800

Note: Nuts to be paired with the same grade of stainless steels screws.