



**STAINLESS STEEL FASTENER**

**MECHANICAL PROPERTIES**

**ANIXTER**

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## STAINLESS STEEL TECHNICAL INFORMATION

This article provides the chemical breakdown and mechanical properties of A2- and A4-grade stainless steel bolts, screws, studs and nuts. Also included in this article is a comparison chart between different international standards available for both grades. The article is intended to give an indication as to the performance capability of each grade.

## STAINLESS STEEL CHEMICAL COMPOSITION REFERENCE

Group	Grade	Chemical Composition, % Maximum Unless Otherwise Stated							
		Carbon	Silicone	Manganese	Phosphorous	Sulphur	Chromium	Molybdenum	Nickel
Austenitic	A2	C	Si	Mn	P	S	Cr	Mo	Ni
		0.08	1.0	2.0	0.05	0.03	17.0 to 20	-	8.0 to 13.0
Austenitic	A4								
		0.08	1.0	2.0	0.05	0.03	16.0 to 18.5	2.0 to 3.0	10.0 to 14.0

Notes for A2. <sup>(a)</sup>May contain titanium  $\geq 5 \times C$  up to 0.8% maximum. <sup>(b)</sup>May contain niobium (columbium) and/or tantalum  $\geq 10 \times C$  up to 1.0% maximum. <sup>(c)</sup>May contain copper up to 4.0% maximum. <sup>(d)</sup>Molybdenum may also be present at the option of the manufacturer.

Notes for A4. <sup>(a)</sup>May contain titanium  $\geq 5 \times C$  up to 0.8% maximum. <sup>(b)</sup>May contain niobium (columbium) and/or tantalum  $\geq 10 \times C$  up to 1.0% maximum. <sup>(c)</sup>May contain Copper up to 4.0% maximum.

## STAINLESS STEEL MECHANICAL PROPERTIES

Group	Grade	Property Class	Diameter Range	Bolts, Screws and Studs			Nuts
Austenitic	A2 and A4			Tensile strength Rm. <sup>(1)</sup> N/mm <sup>2</sup> Min.	Stress at 0.2% Permanent strain Rp0.2 N/mm <sup>2</sup> Min.	Extension AL <sup>(2)</sup> Min.	Proof load stress Sp. N/mm <sup>2</sup>
		50	$\leq M39$	500	210	0.6d	500
		70	$\leq M20^{(3)}$	700	450	0.4d	700
		80	$\leq M20^{(3)}$	800	600	0.3d	800

Note: This is only an extract from British Standards.

<sup>(1)</sup>All tensile stress values are calculated and reported in terms of the normal tensile stress area of the thread.

<sup>(2)</sup>The extension measurements are determined on the actual screw or bolt length and not on a prepared test piece.

<sup>(3)</sup>Above M20 the higher strength property class needs to be agreed with the supplier.

Comparison chart for guidance only. The steels quoted are not necessarily equivalents (these specifications have not been verified by Anixter).

BS 6105: 1981	BS 970 Pt. 1: 1983	BS 970 Pt. 4: 1970	BS 970: 1955	BS 1506: 1986	BS 1506: 1958	UNS	AISI	SAE	Werkstoff	DIN	A FNOR
A2	304S15	304S15	En 58E	-	801B	S30400	304	30304	1.4301	x5 CrNi 18 9	Z 5 CN 18.09
A4	316S31	316S16	En58J	316S31	-	S31600	316	30316	1.4401	x5 CrNiMo 18 10	Z 6 CND 17.11

For more information, contact your local Anixter Fasteners application engineer.