

ALLOY INSIGHTS

1.4913 and 1.4923

How do they compare?



Grade 1.4913 (X19CrMoNbVN11-1) and Grade 1.4923 (X22CrMoV12-1) are martensitic creep-resisting stainless steels with comparable compositions. They are used in high temperature bolting and other similar applications that require high temperature strength. Both grades have good scaling resistance up to 600°C however the variation in their chemical makeup does result mechanical property differences.

Compositions: (from EN 10302)

%	C	Cr	Ni	Mo	Nb	V	Mn	Si*	Other
1.4913	0.17-0.23	10.0-11.5	0.20-0.60	0.50-0.80	0.25-0.55	0.10-0.30	0.40-0.90	0.50	P, S, N, Al, B
1.4923	0.18-0.24	11.0-12.5	0.30-0.80	0.80-1.20	-	0.25-0.35	0.40-0.90	0.50	P, S,

*-Maximum

Mechanical Properties: (from EN 10302; at room temperature)

	Condition*	Tensile Strength (MPa)	0.2% Proof Strength (Min) (MPa)	Elongation (Min.) (%)
1.4913	+QT	900-1050	750	12
1.4923	+QT	800-950	600	14

*-Heat treated as per specification

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Proof Strength at Temperature: (from EN 10302)

	Condition*	Minimum 0.2% Proof Strength at Temperature (MPa)*						
		RT	100°C	200°C	300°C	400°C	500°C	600°C
1.4913	+QT	750	701	651	627	577	495	305
1.4923	+QT	600	560	530	480	420	335	

*-Heat treated as per specification

Creep Strength for 1% Plastic Strain: (from EN 10302)

	Condition*	Guideline Strengths for 1% deformation in 100 000 Hours (MPa)			
		450°C	500°C	550°C	600°C
1.4913	+QT	448	298	153	
1.4923	+QT	373	221	108	44

*-Heat treated as per specification

Comments

- In general terms creep resisting materials are steels, nickel- or cobalt-alloys with a minimum of 8% chromium, which are characterised by good mechanical behaviour at temperatures above 500°C under long-range service conditions. (from EN 10302)
- The data given above is not intended as a substitute for direct reference to the standards.
- There are no direct equivalents for these 2 grades in the ASTM specifications.
- Both grades are covered by the AD 2000 Pressure Vessel Design Codes and the European PED (2014).
- Bar is the commonly produced product form for both grades.
- Both grades have good scaling resistance up to 600°C
- EN 10269, a material standard covering bolting materials specifically, provides for two heat treatments for 1.4923. These are designated QT1 and QT2. QT1 corresponds to QT in this information sheet 1.4923 QT2 is not included in the European PED.

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