

STANDARD	MATERIAL PROPERTIES of steel bolts, screws and studs Chemical composition
ISO : 898 Part 1 EN : 20898 Part 1 DIN : _	

In the table below a specification is given of the steels for the standardized property classes of bolts, screws and studs. The minimum tempering temperatures are mandatory in all cases. The chemical composition limits are mandatory only for those fasteners, which are not subject to tensile testing.

Other standards are available at vaishnavfasteners.com

Property Class	Material And Treatment	Chemical Composition Limits (check Analysis %)			
		C		P	S
		Min	Max	Min	Max
3.6 ¹⁾	Carbon Steel	—	0.20	0.05	0.06
4.6 ¹⁾		—	0.55	0.05	0.06
4.8 ¹⁾		—	0.55	0.05	0.06
5.6 ¹⁾		0.15	0.55	0.05	0.06
5.8 ¹⁾		—	0.55	0.05	0.06
6.8 ¹⁾		—	0.55	0.05	0.06
8.8 ²⁾	Carbon Steel With Additives (e.g. Boron Or Mn Or Cr), Quenched And Tempered Or Carbon Steel, Quenched And Tempered	0.15 ³⁾	0.40	0.035	0.035
		0.25	0.55	0.035	0.035
9.8	Carbon Steel With Additives (e.g. Boron Or Mn Or Cr), Quenched And Tempered	0.15 ³⁾	0.35	0.035	0.035
		0.25	0.55	0.035	0.035
10.9 ¹⁾	Carbon Steel With Additives (e.g. Boron Or Mn Or Cr), Quenched And Tempered	0.15 ³⁾	0.35	0.035	0.035
10.9 ¹⁾	Carbon Steel, Quenched And Tempered Or Carbon Steel With Additives (e.g. Boron Or Mn Or Cr), Quenched And Tempered Allow Steel, Quenched And Tempered ⁷⁾	0.25	0.55	0.035	0.035
		0.20 ³⁾	0.55	0.035	0.035
		0.25	0.55	0.035	0.035
12.9 ^{5), 6)}	Allow Steel, Quenched And Tempered ⁷⁾	0.25	0.50	0.035	0.035

1) Free cutting steel is, allowed for these property classes with the following maximum sulphur, phosphorus and lead contents; 0.34%, phosphorus 0,11%; lead 0,35%.

2) For nominal diameters above 20mm the steel specified for property class 10.9 may be necessary in order to achieve sufficient hardenability.

3) For plain carbon boron alloyed steel with a carbon content below 0,25% (ladle analysis), the minimum manganese content shall be 0.6% for property class 8.8 and 0,7% for property classes 9.8 and 10.9.

4) Product shall be further identified by underlining the symbol of the property class.

5) For the materials of these property classes, it is intended that should be a sufficient harden ability to ensure a structure consisting of approximately 90% martensite in the core of the threaded section for the fasteners in the "as-hardened" condition before tempering.

6) Ametallographically detectable white phosphorus enriched layer is not permitted for property class 12.9 on any surface subjected to tensile stress.

7) Alloy steel shall contain one or more of the alloying elements chromium, nickel, molybdenum or vanadium.