

### PROPERTY CLASS DATA

#### Metric Bolts, Screws and Studs

Ref: ISO 898/1-1988

**DESIGNATION:** Metric Thread Bolts, Screws and Studs are identified by a letter M for the thread profile form. The letter M is followed by the value of nominal diameter expressed in millimeters and nominal length separated by the sign "x". (Example: M 8 x 35)

**MATERIALS:** The table below specifies steels for the different property class of bolts, screws and studs. The minimum tempering temperature is mandatory for property classes 8.8 to 12.9 in all cases.

#### CHEMICAL COMPOSITION

PROPERTY CLASS	MATERIAL AND TREATMENT	CHEMICAL COMPOSITION LIMITS %				TEMPERING TEMPERATURE °C MIN.
		C		P	S	
		min.	max.	max.	max.	
4.6, 4.8, 5.8, 6.8*	Low or medium carbon steel	-	0.55	0.05	0.06	-
8.8	Medium carbon steel quenched, tempered	0.25	0.55	0.04	0.05	425
9.8	Medium carbon steel quenched, tempered	0.25	0.55	0.04	0.05	425
10.9	Medium carbon steel additives e.g. boron, Mn, Cr or Alloy steel - quenched, tempered	0.20	0.55	0.04	0.05	425
12.9	**Alloy steel - quenched, tempered	0.20	0.50	0.035	0.035	380

\*Fee cutting steel is allowed for these classes with the following maximum sulphur, phosphorus and lead content:

S - 0.34% P - 0.11% Lead - 0.35%

\*\*Alloy steel shall contain one or more of chromium, nickel, molybdenum or vanadium

**PROPERTY CLASS:** Symbols consist of two figures. The first indicates 1/100 of the nominal tensile strength in newtons per mm<sup>2</sup>. The second figure indicates 10 times the ratio between nominal yield stress and nominal tensile strength. The multiplication of these two figures will give 1/10 of the nominal yield stress in newtons per mm<sup>2</sup>.

MECHANICAL PROPERTY		PROPERTY CLASS								
		4.8	5.6	5.8	6.8	8.8		9.8	10.9	12.9
						Up to M 16	Over M 16			
Tensile Strength (Rm, N/mm <sup>2</sup> )	nom.	400	500		600	800		900	1000	1200
	min.	420	500	520	600	800	830	900	1040	1220
Vickers Hardness	min.	130	155	160	190	250	255	290	320	385
	max	250				320	336	360	380	435
Brinell Hardness	min.	124	147	152	181	319	242	266	295	353
	max.	238				385	319	342	363	412
Rockwell Hardness	min. HRB	71	79	82	89	-				
	HRC	-	-	-	-	20	23	28	32	39
	HRB	95				99	-			
	max. HRC	-	-	-	-	32	34	37	39	44
Yield Stress ReL. N/mm <sup>2</sup>	nom.	320	300	400	480	-				
	min.	340	300	420	480	-				
Stress at permanent set limit N/mm <sup>2</sup>	nom.	-				640		720	900	1080
	min.	-				640	660	720	940	1100