



Mechanical properties of fasteners made of carbon steel and alloy steel acc. to ISO 898-1

Lp.	Mechanical or physical property		Property class									
			4.6	4.8	5.6	5.8	6.8	8.8		9.8	10.9	12.9
								<i>d</i> ≤16	<i>d</i> >16	<i>d</i> ≤16		<u>12.9</u>
1	Tensile strength, R_m , MPa	min.	400	420	500	520	600	800	830	900	1040	1220
2	Lower yield strength, R_{eL}^d , MPa	min.	240	—	300	—	—	—	—	—	—	—
3	Stress at 0,2 % non-proportional elongation, $R_{p0,2}$ MPa	min.	—	—	—	—	—	640	660	720	940	1100
4	Percentage reduction of area after fracture for machined test pieces, Z , %	min.	—					52		48	48	44
5	Vickers hardness, HV $F \geq 98$ N	min.	120	130	155	160	190	250	255	290	320	385
		Maks	220 ^g					250	320	335	360	380
6	Brinell hardness, HBW $F=30D^2$	min.	114	124	147	152	181	245	250	286	316	380
		maks	209 ^g					238	316	331	355	375
7	Rockwell hardness, HRB	min.	67	71	79	82	89	—				
		maks	95,0 ^g					99,5	—			
	Rockwell hardness, HRC	min.	—					22	23	28	32	39
		maks	—					32	34	37	39	44
8	Reduction of hardness after retempering, HV	maks	—					20				
9	Impact strength. $K_V^{i,j}$, J	min.	—		27	—		27	27	27	27	^k

^d In case where the lower yield strength R_{eL} cannot be determined, it is permissible to measure the stress at 0,2% non-proportional elongation $R_{p0,2}$.

^g Hardness determined at the end of fastener shall be 250 HV, 238 HB or 99,5 HRB max.

ⁱ Values are determined at a test temperature of -20°C.

^j Applies to $d \geq 16$ mm.

^k Value of K_V is under investigation.