

MARYLAND METRICS Technical Data Chart

Extract from BS 3692:1967 with amendment 2 Nov. 1994 (includes grade 14.9 which is not covered by ISO)

Table 10 — Mechanical properties of steel bolts and screws

Mechanical property		Strength grade (property class) designation										
		4.6	4.8	5.6	5.8	6.6	6.8	8.8	10.9	12.9	14.9	
Tensile strength R_m	min.	kgf/mm ²	40		50		60		80	100	120	140
		N/mm ^{2*}	392		490		588		785	981	1177	1373
	max. (see Note 1)	kgf/mm ²	55		70		80		100	120	140	160
		N/mm ^{2*}	539		686		785		981	1177	1373	1569
Brinell hardness	min.	HB	110		140		170		225	280	330	390
	max. (see Note 1)	HB	170		215		245		300	365	425	—
Rock well hardness	min.	HRB	62		77		88		—	—	—	—
		HRC	—		—		—		18	27	34	40
	max. (see Note 1)	HRB	88		97		102		—	—	—	—
		HRC	—		—		—		31	38	44	49
Vickers hardness HV30	min.		110		140		170		225	280	330	400
	max. (see Note 1)		170		215		245		300	370	440	510
Yield stress R_e	min.	kgf/mm ²	24	32	30	40	36	48	—	—	—	—
		N/mm ^{2*}	235	314	294	392	353	471	—	—	—	—
Stress at permanent set limit $R_{0.2}$	min.	kgf/mm ²	—	—	—	—	—	—	64	90	108	126
		N/mm ^{2*}	—	—	—	—	—	—	628	883	1059	1236
Stress under proof load S_p (see Note 2)		S_p/R_e	0.94	0.91	0.94	0.91	0.94	0.91	0.91	0.88	0.88	0.88
		kgf/mm ²	22.6	29.1	28.2	36.4	33.9	43.7	58.2	79.2	95.0	111
		N/mm ^{2*}	222	286	276	357	333	429	571	777	932	1089
Elongation A after fracture	min.	percent	25	14	20	10	16	8	12	9	8	7
Strength under wedge loading	The values for full size bolts equals the minimum values for tensile strength shown above (see Note 3)											
Charpy Impact strength	min.	kgf/cm ²	—						6	4	3	3
		ft lbf	—						22	14	11	11
Head soundness	No fracture (see Note 4)											
Decarburization at root of thread Non-decarburized zone	Depth not more than 1/10 of H_1 (see 11.6) Depth not less than 2/3 of H_1											
NOTE 1 Only for full size bolts.												
NOTE 2 The allowed permanent extension is 12.5 micrometres.												
NOTE 3 The fracture should not take place immediately under the head of the bolt.												
NOTE 4 Where screws are threaded up to the head this property will be regarded as established even if a crack should appear in the first thread, provided that the head does not snap off.												

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