

Mechanical or physical property		Property class				
		4.8	8.8		10.9	12.9
			≤ 16mm	> 16mm		
Tensile Strength, MPa	nom.	400	800		1000	1200
	min.	420	800	830	1040	1220
Lower yield strength, MPa	nom.	-	-	-	-	-
	min.	-	-	-	-	-
Stress at 0.2% non-proportional elongation, MPa	nom.	-	640		900	1080
	min.	-	640	660	940	1100
Stress at 0.0048d non-proportional elongation for full size fasteners, MPa	nom.	320	-	-	-	-
	min.	340 <sup>a</sup>	-	-	-	-
Stress under proof load, MPa	nom.	310	580	600	830	970
Proof strength ratio		0.91	0.91		0.88	0.88
Percentage elongation after fracture for machined test pieces, %	min.	-	12		9	8
Percentage elongation after fracture for machined test pieces, %	min.	-	52		48	44
Elongation after fracture for full-size fasteners	min.	0.24	-		-	-
Head soundness		No fracture				
Vickers hardness, HV	min.	130	250	255	320	385
	max.	220 <sup>b</sup>	320	335	380	435
Brinell hardness, HBW	min.	124	245	250	316	380
	max.	209 <sup>b</sup>	316	331	375	429
Rockwell hardness, HRB	min.	71	-	-	-	-
	max.	95 <sup>b</sup>	-	-	-	-
Rockwell hardness, HRC	min.	-	22	23	32	39
	max.	-	32	34	39	44
Surface hardness, HV 0.3	max.	-	-		390	435
Non-carburization, HV 0.3	max.	-	<b>c</b>		<b>c</b>	<b>c</b>
Height of non-carburized thread zone, mm	min.	-	1/2 <b>H1</b>		2/3 <b>H1</b>	3/4 <b>H1</b>
Depth of complete decarburization in the thread, mm	max.	-	0.015		0.015	0.015
Reduction of hardness after retempering, HV	max.	-	20		20	20
Breaking torque, Nm	min.	-	-		-	-
Impact strength, J	min.	-	27		27	<b>d</b>
Surface integrity in accordance with		ISO 6157-1 or ISO 6157-3 by agreement				ISO 6157-3

(a) The value for lower yield strength for a machined test piece is under investigation. The value given is for calculation of proof stress only. It is not a test value.

(b) Hardness determined at the end of a fastener shall be 250 HV, 238 HB or 99.5 HRB maximum

(c) Surface hardness shall not be more than 30 Vickers points above the measured base metal hardness of the fastener when determination of both surface hardness and base metal hardness are carried out with HV 0.3

(d) Value is under investigation

(H1) Height of external thread in maximum material condition, mm

