



REDISCOVER  
STEEL

Producing  
**Fasteners**  
that are Industry  
**acknowledged**





## Rediscover Steel

**Rediscover Steel** are one of the prominent manufacturers, suppliers and exporters of Pipes, Rebars, Nut and Bolts, Perlin and puff panel, Plates, Round Bars, etc.

We manufacture all these products in various Stainless Steel, Monel, Inconel, Hastelloy, Titanium, Duplex Steel, Alloy Steel, and Alloy 20 etc. We have the most advanced technologies and qualified and efficient personal for inspection, we are also associated with Government Approved laboratories to ensure that the materials supplied by us are as per required specification. With multiple quality checks placed at every step of the manufacturing process, we ensure that only the high quality products of international standards reaches our dedicated packaging unit.

Our basic objective is to cater to the various needs of our clients and provide them with high-quality products for their project needs.

We take pride in satisfactorily meeting the needs of a wide array of industries ranging from civil engineering to infrastructure development and automotive industries, oil and gas industry, Power Generation, Petrochemicals, Pulp and Paper Industry, etc.

We assure our clients will certainly receive quality products and the most reasonable prices and deliveries of our products at the right time with excellent services. Client satisfaction is the award for our good quality and service.



# Nut

A nut is a type of fastener with a threaded hole. Nuts are almost always used in conjunction with a mating bolt to fasten multiple parts together. The two partners are kept together by a combination of their threads' friction (with slight elastic deformation), a slight stretching of the bolt, and compression of the parts to be held together.

**Types of Nut:** Hex Nut, Heavy Hex Nut, Lock Nut, Nylock Nut, Weld Nut, Dome Nut, Flange Nut, Square Nut, Eye Nut, T-Nut, Break Away Nut, Shear Nut, Hex Machine Nuts Small Pattern, Keps-K Lock Nut, Knurled Thumb Nut, Nylon Hex Jam Nut, Nylon Insert Lock Nut, Cap Nut, Castle Nut, Hex Finish Nut, Hex Jam Nut, Hex Machine Nut, Structural Heavy Hex Nut, Coupling Nut, Flange Serrated Nut, Prevailing Torque Lock (Stover) Nut, Slotted Hex Nut, Tri-Groove Nut, Wing Nut.

## Specification of Nut:

Dimension : ASTM, DIN, BS, GB, AS/NZS and all International Standards  
 Size : M3 to M75 OR 1/8" to 3"  
 Heat Treatment : Annealing, Stress Relieving, Case Hardening, Quenching and Tempering.

## Grades

<b>Stainless Steel</b> 304 / 304L / B8, 310, 316 316L, B8M, 316Ti, 317L, 321/B8T, 347/B8C, 904L, 410/B6	<b>Inconel</b> 600, 601, 625, 800, 825	<b>Titanium</b> Grade 2, Grade 5	<b>Alloy Steel</b> HT 8.8, HT 10.9, HT 12.9, ASTM 193 2H/2HM, ASTM A194 (Gr.4, Gr.6, Gr.7/7M)
	<b>Hastelloy</b> C276, C22	<b>Duplex Steel</b> S31803, S32205, S32750, S32760	
	<b>Monel</b> 400, K500	<b>Other</b> Alloy 20, SS 17-4PH/ 15-5PH	



# Bolt / Screw

Bolts belongs to the family of fastener which has three parts- head, chamfer, and a shaft. Materials and objects are positioned using a variety of bolts. A nut is used along with a bolt to secure the objects at a position. Sometimes bolts are called screws as both of them share similar characteristics and differentiating them is complex. In simple terms, a material is fixed together by passing a bolt through it whereas screws fit directly.

**Types of Bolt / Screw:** Hex Head, Square Head, Socket Head Cap Screw, T Bolt, Flange Bolt, J Bolt, L Bolt, Carriage Bolt, Eye Bolt, Custom Made Bolt, Pan Head Screw, Self Tapping Screw, Round Head Screw, CSK Screws, Grub Screw, Threaded Rod, Studs, Coach Screw, Plow Bolt, Step Bolt, Elevator Bolt, Anchor Bolts, Button Head.

## Specification of Bolt / Screw :

Dimension : ASTM,DIN, BS,GB, AS/NZS and all International Standards  
 Length : 10mm upto 500mm & 3/8" upto 20"  
 Bolts Size : M6 upto M72 OR 1/4" upto 3" /Custom Size  
 Screw Size : M02 upto M24/ Custom Size  
 Heat Treatment : Annealing, Stress Relieving, Case Hardening, Quenching and Tempering

## Grades

<b>Stainless Steel</b> 304 / 304L / B8, 310, 316 316L, B8M, 316Ti, 317L, 321/B8T, 347/B8C, 904L, 410, B6	<b>Inconel</b> 600, 601, 625, 800, 825	<b>Titanium</b> Grade 2, Grade 5	<b>Alloy Steel</b> HT 8.8, HT 10.9, HT 12.9, ASTM A194 B7, ASTM A194 B16
	<b>Hastelloy</b> C276, C22	<b>Duplex Steel</b> S31803, S32205, S32750, S32760	
	<b>Monel</b> 400, K500	<b>Other</b> Alloy 20, SS 17-4PH/ 15-5PH	



# Threaded Rods / Studs

A threaded rod, also known as a stud, is a relatively long rod that is threaded on both ends; the thread may extend along the complete length of the rod. They are designed to be used in tension. Threaded rod in bar stock form is often called all-thread.

**Types of Threaded Rods:** Zinc Plated, Plain, Hot Dip Galv. & Yellow Zinc, Double End Threaded Rods, Fine Pitch Threaded Rods, Metric Threaded Rods, All thread Rods, Heavy Threaded Rods, Acme Threaded Rods, Fully Threaded Rods, Partially Threaded Rods, Tap End Threaded Rods, Trapezoidal Threaded Rods, Coil Rod, Threaded Bars.

## Specification of Threaded Rods / Studs :

Dimension : ASTM, DIN, BS, GB, AS/NZS and all International Standards  
 Size : M6 to M52 & 1/4" to 2"  
 Length : 1000mm to 3000mm & 1feet to 12feet  
 Standard : DIN 975, DIN 976, DIN 938, DIN 939, DIN 940, DIN 835 etc.  
 Finish : Zinc Plated, Plain, Hot Dip Galv. & Yellow Zinc

## Grades

<b>Stainless Steel</b> 304 / 304L / B8, 310, 316 / 316L, 316Ti, 317L, 321 / B8T, 347 / B8C, 904L, 410 / B6	<b>Inconel</b> 600, 601, 625, 800, 825	<b>Titanium</b> Grade 2, Grade 5	<b>Alloy Steel</b> HT 8.8, HT 10.9, HT 12.9, ASTM 194 B7/ ASTM A193 2H, ASTM A194 B16/ ASTM A194 Gr. 4
	<b>Hastelloy</b> C276, C22	<b>Duplex Steel</b> S31803, S32205, S32750, S32760	
	<b>Monel</b> 400, K500	<b>Other</b> Alloy 20, SS 17-4PH / 15-5PH	



## Bolt Grades

BOLT GRADE	RAW MATERIAL
B5	5% Chromium Ferritic Steel
B6	13% Chromium Ferritic Steel
B7	Chromium Molybdenum Alloy Steel, Quenched & Tempered
B7M	Chromium Molybdenum Alloy Steel, Quenched & Tempered
B16	Chromium-molybdenum-vanadium Alloy Steel, Quenched & Tempered
B8	AISI 304 Stainless Steel, Carbide Solution Treated
BB Class 2	AISI 304 Stainless Steel, Carbide Solution Treated and Strain Hardened
B8M	AISI 316 Stainless Steel, Carbide Solution Treated
B8M Class 2	AISI 316 Stainless Steel, Carbide Solution Treated and Strain Hardened
B8T	AISI 321 Stainless Steel, Carbide Solution Treated
B8T Class 2	AISI 321 Stainless Steel, Carbide Solution Treated and Strain Hardened

## Recommended Nuts & Washers

Bolt Specification	Nut Specification	Washer Specification
ASTM A193 Grade B5	ASTM A194 Grade 3	ASTM A36 Mild Steel
ASTM A193 Grade B6	ASTM A194 Grade 6	ASTM A240 Grade 410
ASTM A193 Grade B7	ASTM A194 Grade 2H	ASTM F436 Type 1
ASTM A193 Grade B7M	ASTM A194 Grade 2HM	ASTM F436 Type 1
ASTM A193 Grade B16	ASTM A194 Grade 16	ASTM F436 Type 1
ASTM A193 Grade B8	ASTM A194 Grade 8	ASTM A240 Grade 304
ASTM A193 Grade B8M	ASTM A194 Grade 8M	ASTM A240 Grade 316
ASTM A193 Grade B8T	ASTM A194 Grade 8T	ASTM A240 Grade 321





## CHEMICAL PROPERTIES OF BOLTS/SCREWS/STUDS TO ASTM A193 - A193 M-95

Grade/Den SYMBOL/ MARKING	CHEMICAL PROPERTIES (COMPOSITION, PERCENT)												EQUIVALENT GRADE
	C	MN	P	S	SI	CR	NI	MO	V	CO+TI	N	CU	
<b>A. FERRITIC STEELS</b>													
B5 B5	0.10 MIN.	1.00 MAX.	0.040 MAX.	0.030 MAX.	1.00 MAX.	4.00- 6.00	—	0.40- 0.65	—	—	—	—	AISI 501
B6 B6	0.15 MIN.	1.00 MAX.	0.040 MAX.	0.030 MAX.	1.00 MAX.	11.50- 13.50	—	—	—	—	—	—	AISI 410 12Cr13
B6X B6X	0.15 MIN.	1.00 MAX.	0.040 MAX.	0.030 MAX.	1.00 MAX.	11.50- 13.50	—	—	—	—	—	—	AISI 410 12Cr13
B7 B7	0.37- 0.49	0.65- 1.00	0.35- MAX	0.40- MAX	0.15- 0.35	0.75- 1.20	—	0.15- 0.25	—	—	—	—	AISI 4140/ En-19
B7 M B7 M	0.37- 0.49	0.65- 1.00	0.35- MAX	0.40- MAX	0.15- 0.35	0.75- 1.20	—	0.15- 0.25	—	—	—	—	AISI 4140/ En-19, 19A
B16 B16	0.36- 0.47	0.45- 0.70	0.35- MAX	0.40- MAX	0.15- 0.35	0.80- 1.15	—	0.50- 0.65	0.25- 0.35	—	—	—	45CrMoV67 TO DIN SP.
<b>B. AUSTENITIC STEELS</b>													
B8/CLASS 1 B8	0.08 MAX.	2.00 MAX.	0.050 MAX.	0.030 MAX.	1.00 MAX.	18.00- 20.00	8.00- 10.50	—	—	—	—	—	AISI 304/ 04Cr18Ni10
B8A/CLASS 1A B8A	0.08 MAX.	2.00 MAX.	0.050 MAX.	0.030 MAX.	1.00 MAX.	18.00- 20.00	8.00- 10.50	—	—	—	—	—	AISI 304/ 04Cr18Ni10
B8C/CLASS 1 B8C	0.08 MAX.	2.00 MAX.	0.045 MAX.	0.030 MAX.	1.00 MAX.	17.00- 19.00	9.00- 13.00	—	—	10XC MIN.	—	—	AISI 347
B8CA/CLASS 1A B8C	0.08 MAX.	2.00 MAX.	0.045 MAX.	0.030 MAX.	1.00 MAX.	17.00- 19.00	9.00- 13.00	—	—	10XC MIN.	—	—	AISI 347
B8M/CLASS 1 B8M	0.08 MAX.	2.00 MAX.	0.045 MAX.	0.030 MAX.	1.00 MAX.	16.00- 18.00	10.00- 14.00	2.00- 3.00	—	—	—	—	AISI 316/ 04Cr17Ni12Mo2
B8MA/CLASS 1A B8D	0.08 MAX.	2.00 MAX.	0.045 MAX.	0.030 MAX.	1.00 MAX.	16.00- 18.00	10.00- 14.00	2.00- 3.00	—	—	—	—	AISI 347 04Cr17Ni12Mo2
B8M2/CLASS 2B B9G	0.08 MAX.	2.00 MAX.	0.045 MAX.	0.030 MAX.	1.00 MAX.	16.00- 18.00	10.00- 14.00	2.00- 3.00	—	—	—	—	AISI 347 04Cr17Ni12Mo2
B8M3/CLASS 2C B9H	0.08 MAX.	2.00 MAX.	0.045 MAX.	0.030 MAX.	1.00 MAX.	16.00- 18.00	10.00- 14.00	2.00- 3.00	—	—	—	—	AISI 347 04Cr17Ni12Mo2
B8N/CLASS 1B B8N	0.08 MAX.	2.00 MAX.	0.045 MAX.	0.030 MAX.	1.00 MAX.	18.00- 20.00	8.00- 10.50	—	—	—	0.10- 0.16	—	AISI 304N 04Cr17Ni12Mo2
B8NA/CLASS 1A B8V	0.08 MAX.	2.00 MAX.	0.045 MAX.	0.030 MAX.	1.00 MAX.	18.00- 20.00	8.00- 10.00	—	—	—	0.10- 0.16	—	AISI 347 04Cr17Ni12Mo2
B8MNA/CLASS 1B B8Y	0.08 MAX.	2.00 MAX.	0.045 MAX.	0.030 MAX.	1.00 MAX.	16.00- 18.00	10.00- 14.00	2.00- 3.00	—	—	0.10- 0.16	—	AISI 347 04Cr17Ni12Mo2
B8MNA/CLASS 1 B8Y	0.08 MAX.	2.00 MAX.	0.045 MAX.	0.030 MAX.	1.00 MAX.	16.00- 18.00	10.00- 14.00	—	—	—	0.10- 0.16	—	AISI 316
B8T/CLASS 2 B8T	0.08 MAX.	2.00 MAX.	0.045 MAX.	0.030 MAX.	1.00 MAX.	17.00- 19.00	9.00- 12.00	—	—	5XC MIN.	—	—	AISI 321 04Cr17Ni12Mo20
B8TA/CLASS 1A B8J	0.08 MAX.	2.00 MAX.	0.045 MAX.	0.030 MAX.	1.00 MAX.	17.00- 19.00	9.00- 12.00	—	—	5XC MIN.	—	—	AISI 321 04Cr17Ni12Mo20

## MECHANICAL PROPERTIES OF BOLTS/SCREWS/STUDS TO ASTM A193 - A193 M-95

Grade/Den SYMBOL/ MARKING	MECHANICAL PROPERTIES (FOR DIAMETER 65MM AND UNDER)						
	UTS, MIN. ksi (MPa)	Y.S. MIN. 0.2% OFFSET ksi (MPa)	ELONG. % MIN.	RED. OF AREA %, MIN.	HARDNESS MAX.	MIN. TEMPER TEMP°C	HEAT TREATMENT DETAILS
<b>A. FERRITIC STEELS</b>							
B5 B5	100 (690)	80 (550)	16	50	14.20 HRC	593	H & T
B6 B6	110 (760)	85 (585)	15	50	18-25 HRC	593	H & T
B6X B6X	90 (620)	70 (485)	16	50	26 HRC	593	H & T
B7 B7	125 (860)	105 (720)	16	50	23-22 HRC	593	H & T
B7 M B7 M	125 (860)	105 (720)	16	50	14-21 HRC 100% TEST	62C	H & T
B16 B16	125 (860)	105 (725)	16	50	23-32 HRC	650	H & T
<b>B. AUSTENITIC STEELS</b>							
B8/CLASS 1 B8	75 (515)	30 (205)	30	50	16 HRC MAX.	CARBIDE SOLUTION TREATED	
B8A/CLASS 1A B8A	75 (515)	30 (205)	30	50	192 BHN MAX.	CARBIDE SOLUTION TREATED IN FINISHED CONDITION	
B8C/CLASS 1 B8C	75 (515)	30 (205)	30	50	18 HRC	CARBIDE SOLUTION MAX TREATED	
B8CA/CLASS 1A B8C	75 (515)	30 (205)	30	50	192 BHN MAX.	CARBIDE SOLUTION TREATED IN FINISHED CONDITION	
B8M/CLASS 1 B8M	75 (515)	30 (205)	30	50	18 HRC MAX.	CARBIDE SOLUTION TREATED	
B8MA/CLASS 1A B8D	75 (515)	30 (205)	30	50	192 BHN MAX.	CARBIDE SOLUTION TREATED IN FINISHED CONDITION	
B8M2/CLASS 2B B9G	75 (515)	30 (205)	30	40	35 HRC MAX.	CARBIDE SOLUTION TREATED IN FINISHED CONDITION	
B8M3/CLASS 2C B9H	75 (515)	30 (205)	30	60	35 HRC MAX.	CARBIDE SOLUTION TREATED & STRAIN HARDENED	
B8N/CLASS 1B B8N	80 (550)	35 (240)	30	40	18 HRC MAX.	CARBIDE SOLUTION TREATED	
B8NA/CLASS 1A B8V	75 (515)	30 (205)	30	50	192 BHN MAX.	CARBIDE SOLUTION TREATED IN FINISHED CONDITION	
B8MNA/CLASS 1B B8Y	75 (515)	30 (240)	30	40	18 HRC MAX.	CARBIDE SOLUTION TREATED	
B8MNA/CLASS 1 B8Y	75 (515)	30 (205)	30	50	192 BHN MAX.	CARBIDE SOLUTION TREATED IN FINISHED CONDITION	
B8T/CLASS 2 B8T	125 (860)	100 (690)	12	35	35 BHN MAX.	CARBIDE SOLUTION TREATED & STRAIN HARDENED	
B8TA/CLASS 1A B8J	75 (515)	30 (205)	30	50	192 BHN MAX.	CARBIDE SOLUTION TREATED IN FINISHED CONDITION	

## AS/NZS 4671: 2019

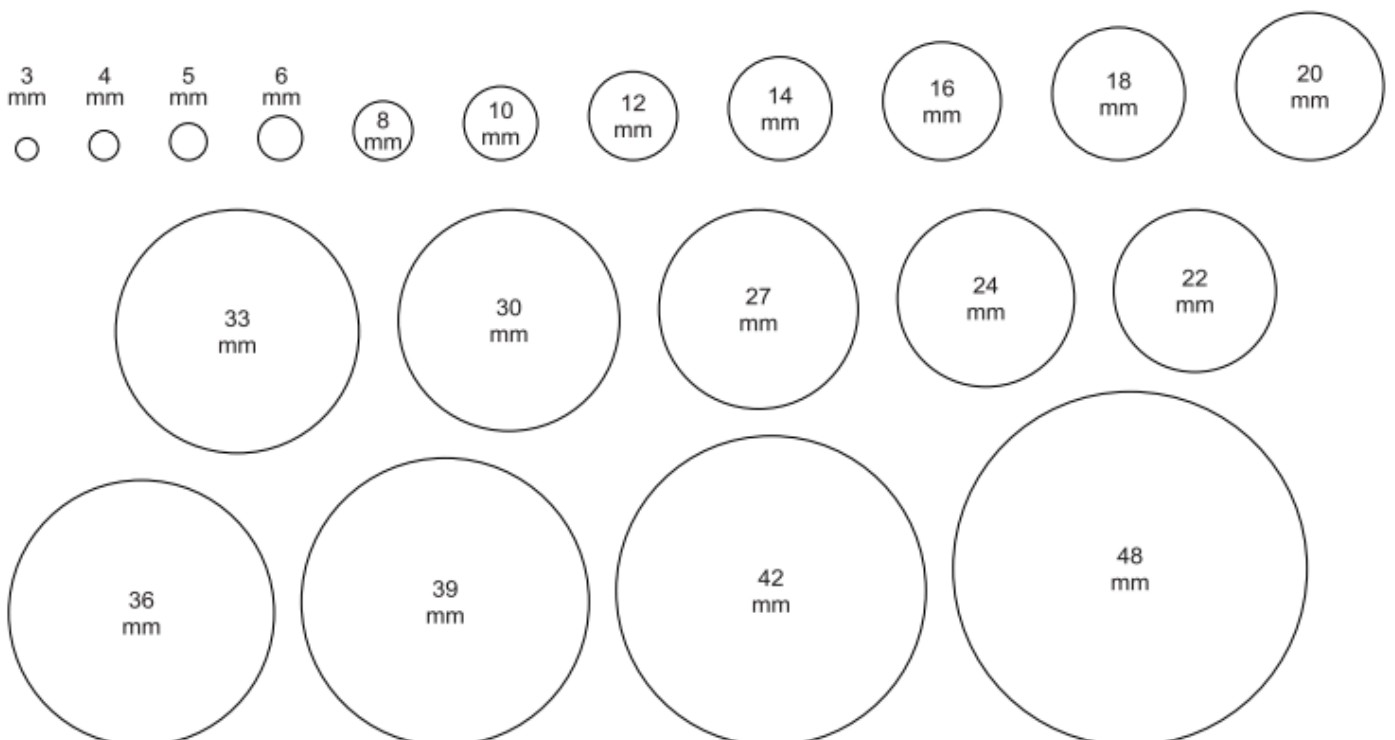
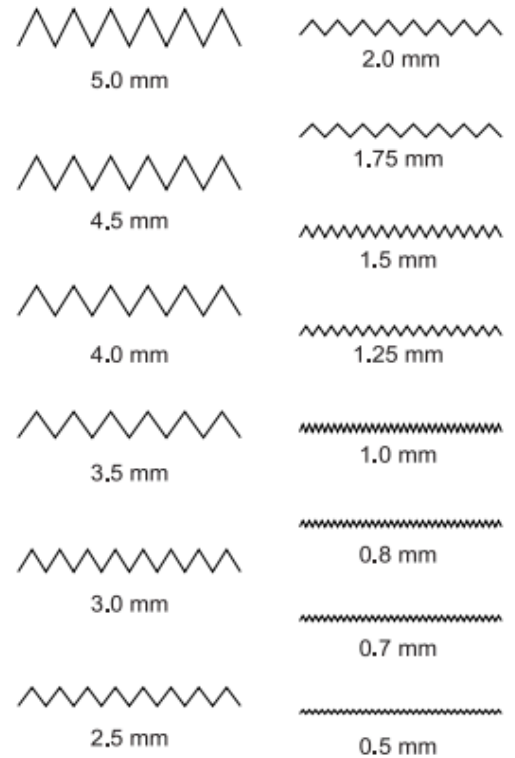
### Mechanical and physical properties of bolts, screws and studs

Sub-clause number	Mechanical and physical property	Property Class											
		3.6	4.6	4.8	5.6	5.8	6.8	8.8 <sup>a</sup>		9.8 <sup>b</sup>	10.9	12.9	
								d ≤ 16 <sup>c</sup> mm	d ≥ 16 <sup>c</sup> mm				
5.1	Nominal tensile strength, $R_{m, nom}$ N/mm <sup>2</sup>	300	400		500		600	800	800	900	1000	1200	
5.2	Minimum tensile strength, $R_{m, min}^{da}$ N/mm <sup>2</sup>	330	400	420	500	520	600	800	830	900	1040	1220	
5.3	Vickers hardness, HV F > 98 N	min	95	120	130	155	160	190	250	255	290	320	385
		max	220 <sup>i</sup>					250	320	335	360	380	435
5.4	Brinell hardness, HB F = 30 D <sup>2</sup>	min	90	114	124	147	152	181	238	242	276	304	366
		max	209 <sup>i</sup>					238	304	318	342	361	414
5.5	Rockwell hardness, HR	min HRB	52	67	71	79	82	89	-	-	-	-	-
		max HRC	-	-	-	-	-	-	22	23	28	32	39
		min HRB	95.0 <sup>i</sup>					99.5	-	-	-	-	-
		min HRC	-					-	32	34	37	39	44
5.6	Surface hardness, HV 0,3	max	-					g					
5.7	Lower yield stress $R_{el}^h$ , N/mm <sup>2</sup>	nom	180	240	320	300	400	480	-	-	-	-	-
		min	190	240	340	300	420	480	-	-	-	-	-
5.8	Stress at 0.2% non-proportional elongation $R_{p0.2}^i$ , N/mm <sup>2</sup>	nom	-					-	640	640	720	900	1080
		min	-					-	640	660	720	940	1100
5.9	Stress at proof load, $S_p$ $S_p/R_{el}$ or $S_p/R_{p0.2}$ N/mm <sup>2</sup>	$S_p/R_{el}$ or $S_p/R_{p0.2}$	0,94	0,94	0,91	0,93	0,90	0,92	0,91	0,91	0,90	0,88	0,88
		N/mm <sup>2</sup>	180	225	310	280	380	440	580	600	650	830	970
5.10	Breaking torque, $M_b$ Nm min	-					See ISO 898-7						
5.11	Percent elongation after fracture, A min	25	22	-	20	-	-	12	12	10	9	8	
5.12	Reduction area after fracture, Z % min	-					52		48	48	44		
5.13	Strength under wedge loading <sup>e</sup>	The values for full size bolts and screws (no studs) shall not be smaller than the minimum values for tensile strength shown in 5.2											
5.14	Impact strength, KU J min	-		25	-		30	30	25	20	15		
5.15	Head soundness	No fracture											
5.16	Minimum height of non-decarburized thread zone, E	-					$\frac{1}{2} H_1$		$\frac{2}{3} H_1$	$\frac{3}{4} H_1$			
	Maximum depth of complete decarburization, G mm	-					0.015						
5.17	Hardness after retempering	-					Reduction of hardness 20 HV maximum						
5.18	Surface integrity	In accordance with ISO 6157-1 or ISO 6157-3 as appropriate											

## Thread Pitch Chart

Metric Diameter	Pitch mm	
	Coarse Standard	Fine Standard
3mm	0.50	0.35
4mm	0.70	0.50
5mm	0.80	0.50
6mm	1.00	0.75
8mm	1.25	1.00
10mm	1.50	1.25
12mm	1.75	1.25
14mm	2.00	1.50
16mm	2.00	1.50
18mm	2.50	1.50
20mm	2.50	1.50
22mm	2.50	1.50
24mm	3.00	2.00
27mm	3.00	2.00
30mm	3.50	2.00
33mm	3.50	2.00
36mm	4.00	3.00
39mm	4.00	3.00
42mm	4.50	3.00
48mm	5.00	3.00

### Metric Thread Pitches





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