



## BOLT LOAD CAPACITY TABLES TO BS5950 PART 1, 2000 THE ULTIMATE LIMIT STATE (ie FACTORED APPLIED LOADS)

GRADE 4.6 BOLTS														
Bolt Size	Gross Area	Tensile Capacity at 195N/mm <sup>2</sup>	Shear Capacity at 160N/mm <sup>2</sup> THREADS IN SHEAR PLANE		In Grade 43, bearing capacity = 460N/mm <sup>2</sup> , for e ≥ 2d									
					In Grade 50, bearing capacity = 550N/mm <sup>2</sup> , for e ≥ 2d									
					Thickness in mm of plate passed through									
	mm <sup>2</sup>	kN	Single	Double	5	6	7	8	9	10	12	15	18	
M16	157	30.6	25.1	50.2	36.8 (44.0)	44.2 (52.8)	51.5							
M20	245	47.8	39.2	78.4	46.0 (55.0)	55.2 (66.0)	64.4 (77.0)	73.6	82.8					
(M22)	303	59.1	48.5	97.0	50.6 (60.5)	60.7 (72.6)	70.8 (84.7)	81.0 (96.8)	91.1	101				
M24	353	68.8	56.5	113	55.2 (66.0)	66.2 (79.2)	77.3 (92.4)	88.3 (106)	99.4 (119)	110				
M27	459	89.5	73.4	147	62.1 (74.2)	74.5 (89.1)	86.9 (104)	99.3 (118)	111.8 (133)	124 (148)	149			
M30	561	109	89.8	180	69 (82.5)	82.8 (99.0)	96.6 (115)	110 (132)	124 (148)	138 (165)	165 (198)	207		

GRADE 8.8 BOLTS															
Bolt Size	Tensile Capacity at 450N/mm <sup>2</sup>	Shear Capacity at 375N/mm <sup>2</sup> THREADS IN SHEAR PLANE		In Grade 43, bearing capacity = 460N/mm <sup>2</sup> , for e ≥ 2d											
				In Grade 50, bearing capacity = 550N/mm <sup>2</sup> , for e ≥ 2d											
				Thickness in mm of plate passed through											
	kN	Single	Double	5	6	7	8	9	10	12	15	18	20	22	25
M16	70.7	58.9	118	36.8 (44.0)	44.2 (52.8)	51.5 (61.6)	58.9 (70.4)	66.2 (79.2)	73.6 (88.0)	88.3 (106)	110 (132)	132			
M20	110	91.9	184	46.0 (55.0)	55.2 (66.0)	64.4 (77.0)	73.6 (88.0)	82.8 (99.0)	92.0 (110)	110 (132)	138 (165)	166 (198)	184		
(M22)	136	114	227	50.6 (60.5)	60.7 (72.6)	70.8 (84.7)	81.0 (96.8)	91.1 (109)	101 (121)	121 (145)	152 (182)	182 (218)	202 (242)	223	253
M24	159	132	265	55.2 (66.0)	66.2 (79.2)	77.3 (92.4)	88.3 (106)	99.4 (119)	110 (132)	132 (158)	166 (198)	199 (238)	221 (264)	243 (290)	276
M27	207	172	344	62.1 (74.2)	74.5 (89.1)	86.9 (104)	99.3 (118)	111.8 (133)	124 (148)	149 (178)	186 (222)	223 (267)	248 (297)	273 (371)	310
M30	252	210	421	69 (82.5)	82.8 (99.0)	96.6 (115)	110 (132)	124 (148)	138 (165)	165 (198)	207 (247)	248 (297)	276 (330)	303 (363)	345 (413)

**NOTES :-**

- The following tables are for ISO metric coarse thread bolts
- a) The specification for ISO metric precision bolts (all grades) is BS3692 : 2001  
b) The specification for ISO metric black bolts (wide tolerance) (grade 4.6 only) is BS4190 : 2001
- a) For tensile capacities the gross area (tensile area) of the bolt shall be used (see clause 6.3.1)  
b) For shear capacities the gross area (tensile area) of the bolt shall be used (see clause 6.3.1)  
c) For bearing capacities the nominal diameter or nominal area of the bolt shall be used (see clause 6.3.3)
- The allowable stresses of the bolts are :-

	Grade 4.6	Grade 8.8	Code Ref
(N/mm <sup>2</sup> )	(Mild Steel)	(High Yield Steel)	
S <sub>t</sub> (tensile)	192 (say 195)	448 (say 450)	Table 34 (value x 0.8)
S <sub>v</sub> (shear)	160	375	Table 30
S <sub>b</sub> (bearing)	460	1000	Table 31

- The allowable stresses for the parent metal are :-

	Grade 43	Grade 50	Code Ref
f <sub>b</sub>	460	550	Table 32