



## BOLT LOAD CAPACITY TABLES TO BS449 PART 2, AMENDED NOV 1995 THE ALLOWABLE STRESS METHOD (ie UNFACTORED APPLIED LOADS)

GRADE 4.6 BOLTS															
Bolt Size	Gross Area mm <sup>2</sup>	Tensile Capacity at 120N/mm <sup>2</sup> kN	Nominal Area mm <sup>2</sup>	Shear Capacity at 80N/mm <sup>2</sup> THREADS IN SHEAR PLANE		In Grade 43, bearing capacity = 250N/mm <sup>2</sup> , for e ≥ 2d									
						In Grade 50, bearing capacity = 350N/mm <sup>2</sup> , for e ≥ 2d									
						Thickness in mm of plate passed through									
				Single	Double	5	6	7	8	9	10	12	15	18	
M16	157	18.8	201	16.1	32.2	20 (28)	24 (34)	28	32	36					
M20	245	29.4	314	25.1	50.2	25 (35)	30 (42)	35 (49)	40 (56)	45	50	60			
(M22)	303	36.4	380	30.4	60.8	27 (38)	33 (46)	38 (54)	44 (62)	49	55	66			
M24	353	42.4	452	36.2	72.4	30 (42)	36 (50)	42 (59)	48 (67)	54 (76)	60	72	90		
M27	459	55.1	572	45.8	91.6	34 (47)	41 (57)	47 (66)	54 (76)	61 (85)	68 (95)	81	101		
M30	561	67.3	707	56.6	113.2	38 (53)	45 (63)	53 (74)	60 (84)	68 (95)	75 (105)	90 (126)	113	135	

GRADE 8.8 BOLTS																
Bolt Size	Tensile Capacity at 281N/mm <sup>2</sup> kN	Shear Capacity at 187N/mm <sup>2</sup> THREADS IN SHEAR PLANE		In Grade 43, bearing capacity = 250N/mm <sup>2</sup> , for e ≥ 2d												
				In Grade 50, bearing capacity = 350N/mm <sup>2</sup> , for e ≥ 2d												
				Thickness in mm of plate passed through												
		Single	Double	5	6	7	8	9	10	12	15	18	20	22	25	30
M16	44.1	37.6	75.2	20 (28)	24 (34)	28 (39)	32 (45)	36 (50)	40 (56)	48 (67)	60 (84)	72	80			
M20	68.8	58.7	117.4	25 (35)	30 (42)	35 (49)	40 (56)	45 (63)	50 (70)	60 (84)	75 (105)	90 (125)	100	110	125	
(M22)	85.1	71.1	142.2	27 (38)	33 (46)	38 (54)	44 (62)	49 (69)	55 (77)	66 (92)	82 (115)	99 (137)	110 (154)			
M24	99.2	84.5	169	30 (42)	36 (50)	42 (59)	48 (67)	54 (76)	60 (84)	72 (101)	90 (126)	108 (151)	120 (168)	132 (185)		
M27	129	107	214	34 (47)	41 (57)	47 (66)	54 (76)	61 (85)	68 (95)	81 (113)	101 (142)	122 (170)	135 (189)	149 (208)	169 (236)	203
M30	157.6	132.2	264.4	38 (53)	45 (63)	53 (74)	60 (84)	68 (95)	75 (105)	90 (126)	113 (158)	135 (189)	150 (210)	165 (231)	188 (263)	225

**NOTES :-**

- 1) The above tables are for ISO metric coarse thread bolts
- 2) 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
- 3) a) For tensile capacities the gross area (tensile area) of the bolt shall be used (see clause 50a)  
b) For shear capacities the nominal diameter or nominal area of the bolt shall be used (see clause 50a)  
c) For bearing capacities the nominal diameter or nominal area of the bolt shall be used (see clause 50a)
- 4) 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)		
St (tensile)	120	* 281	Table 20	* 281 = (0.7 x 785)/235 x 120
Sv (shear)	80	187	Table 20	
Sb (bearing)	250	585	Table 20	

- 5) The allowable stresses for the parent metal are :-

	Grade 43	Grade 50	Code Ref
fb	250	350	Table 20A