

Design Data

Concrete

Loads shown are for 30N/mm² (C20/25) concrete.
For other grades of concrete between 20 and 50N/mm² where the anchor is in tension the load can be calculated using the following empirical formula:

$$\text{Tensile SWL in } 30\text{N/mm}^2 \text{ Concrete} \times \sqrt{\frac{\text{Actual Concrete Strength}}{30}}$$

This calculation is not valid for shear.

Edge and Spacing Distances

The loads shown are applicable to characteristic edge and spacing distances. For reduced edge and spacing distances, reduction factors must be calculated from the appropriate tables below.

Performance Data: Set Flush to Surface & Set at Depth

SIZE	SAFE WORKING LOAD (TENSION) (kN)				FAILURE LOAD (TENSION) (kN)				CHARACTERISTIC EDGE DISTANCE (mm) Tension	CHARACTERISTIC SPACING (mm) Tension
	ANCHOR SET FLUSH TO SURFACE* Concrete Strength		ANCHOR SET AT DEPTH** Concrete Strength		ANCHOR SET FLUSH TO SURFACE* Concrete Strength		ANCHOR SET AT DEPTH** Concrete Strength			
	30N/mm ²	60N/mm ²	30N/mm ²	60N/mm ²	30N/mm ²	60N/mm ²	30N/mm ²	60N/mm ²		
M8	4.8	5.0	7.9	9.4	14.4	14.6	23.8	30.9	160	180
M10	7.6	8.0	13.3	16.5	22.8	23.2	40.1	52.1	180	220
M12	10.5	11.2	17.3	21.6	31.5	33.7	51.8	67.3	200	260
M16	18.8	20.9	26.9	34.2	56.4	62.8	80.9	105.0	280	340
M20	26.0	31.8	38.3	49.0	80.1	98.0	115.0	150.0	320	380

* Grade of stud 4.6 ** Grade of stud 8.8

Reduction Factors - Edge and Spacing Distances

The characteristic edge and spacing distances quoted in the table above are the minimum allowable for the quoted safe loads to apply. Where the design dictates reduced edge and spacing distances, the appropriate reduction factor/s from the tables below must be applied to the safe working load. Choose the required bolt diameter across the top of the table

and read down the left hand column until actual edge or spacing distance is found. Read off the reduction factor where the two lines intersect (interpolate as required). Multiply this factor by the safe working load quoted in the table. On the occasion that multiple close edge and/or spacing distances occur, the appropriate reduction factors must be applied.

Edge Distance (Concrete)

EDGE (mm)	TENSILE : EDGE REDUCTION FACTORS				
	M8	M10	M12	M16	M20
70	0.72				
80	0.75	0.70			
90	0.78	0.73	0.70		
100	0.81	0.76	0.73		
120	0.87	0.82	0.78	0.72	
140	0.94	0.88	0.84	0.75	0.70
160	1.0	0.94	0.89	0.79	0.73
180		1.0	0.94	0.82	0.77
200			1.0	0.86	0.80
240				0.93	0.87
280				1.0	0.93
320					1.0

Spacing (Concrete)

SPACING (mm)	TENSILE REDUCTION FACTORS				
	M8	M10	M12	M16	M20
60	0.70				
80	0.75	0.70			
100	0.80	0.74	0.65		
140	0.90	0.83	0.74	0.72	
180	1.0	0.91	0.82	0.78	0.70
220		1.0	0.91	0.83	0.76
260			1.0	0.89	0.82
300				0.94	0.88
340				1.0	0.94
380					1.0