

## Design Data

### Concrete

Loads shown are for 30N/mm<sup>2</sup> (C20/25) concrete.  
For other grades of concrete between 20 and 50N/mm<sup>2</sup> where 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 closer spacing, reduction factors must be calculated from the appropriate table below. Characteristic edge distances must not be reduced.

## Performance Data

SIZE	CONCRETE 30N/mm <sup>2</sup> (C20/25)						
	SAFE WORKING LOAD (kN)		FAILURE LOAD (kN)		CHARACTERISTIC EDGE DISTANCE (mm)		CHARACTERISTIC SPACING (mm)
	Tension	Shear	Tension	Shear	Tension	Shear	Tension & Shear
M6	2.4	2.0	10.0	7.0	80	80	90
M8	4.2	3.4	12.0	12.0	90	90	110
M10	5.3	5.4	22.0	19.0	120	120	140
M12	8.4	7.9	25.0	27.7	160	160	170
M16	11.0	14.7	58.0	51.5	220	220	250
M20	16.0	23.0	86.0	80.4	250	250	300

### 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 closer spacing distances, the appropriate reduction factor/s from the tables below must be applied to the safe working load.

### Combined Load

When selecting an anchor which will carry a combined load, ensure that the bolt size selected satisfies the following equation:

$$\frac{\text{Applied Tensile Load}}{\text{Safe Static Tensile Load}} + \frac{\text{Applied Shear Load}}{\text{Safe Static Shear Load}} \leq 1.2$$

(Spacing reduction factors, if applicable, should be applied to the safe tensile and safe shear loads).

Choose the required bolt diameter across the top of the table and read down the left hand column until actual spacing distance is found. Read off the reduction factor where the two lines intersect. Multiply this factor by the safe working load quoted in the table.

## Edge Distance (Concrete)

EDGE (mm)	TENSILE : EDGE REDUCTION FACTORS							SHEAR : EDGE REDUCTION FACTORS						
	M6	M8	M10	M12	M16	M20	M6	M8	M10	M12	M16	M20		
70														
80	1.0							1.0						
90		1.0							1.0					
100														
120			1.0						1.0					
140														
160				1.0						1.0				
190														
220					1.0						1.0			
250						1.0						1.0		

## Spacing (Concrete)

SPACING (mm)	TENSILE & SHEAR REDUCTION FACTORS						
	M6	M8	M10	M12	M16	M20	
50	0.80						
60	0.85	8.0					
70	0.90	0.84	0.80				
90	1.0	0.92	0.86	0.80			
110		1.0	0.91	0.85	0.80		
140			1.0	0.93	0.84	0.80	
170				1.0	0.88	0.84	
210					0.94	0.89	
250						1.0	
300							