



1

All steel assembly for maximum performance even in fire situations

2

Bolt lengths suitable for fixture thickness up to 150mm

3

Ferrule marked with hole diameter for correct installation

4

Pressed steel segments ensure consistent dimensional accuracy and positive expansion

5

Optimum taper nut angle for maximum expansion in all substrates

### Product Data

The Rawlbolt® Shield Anchor is the world's most popular torque controlled expanding shield anchor, combining ease of installation with good load carrying capacity.

It is the ideal general purpose anchor bolt, having higher degrees of expansion than other types of expansion anchor and excellent tolerance to variations in hole sizes. The collapsible ferrule ensures positive clamping force is transmitted to the fixture.

The expansion shield is available without the bolt for customised applications.

### Available in:

Yellow passivated zinc-plated steel

### Typical Applications:

Roller Shutter Doors  
Fire Doors  
Steelwork

Security Grills  
Machinery  
Pipework/Ductwork Support

### Approvals:

The Rawlbolt® anchor is approved by major UK and International Independent approval bodies.



## Rawlbolt® Shield Anchor: Loose Bolt

REF	BOLT SIZE (d)	BOLT LENGTH (mm) (l)	SHIELD LENGTH (mm) (s)	FIXTURE THICKNESS (mm)		HOLE DIAMETER (mm)		MINIMUM HOLE DEPTH (mm) (b <sub>o</sub> )	MINIMUM SUBSTRATE THICKNESS (mm) (b <sub>min</sub> )	RECOMMENDED TORQUE (Nm)		PRODUCT CODE
				MAX (mm) (T <sub>fix</sub> )	MIN (mm) (T <sub>fix</sub> )	IN FIXTURE (d <sub>f</sub> )	IN SUBSTRATE (d <sub>o</sub> )			30N/mm <sup>2</sup> Concrete (T <sub>inst</sub> )	20.5N/mm <sup>2</sup> Brickwork (T <sub>inst</sub> )	
M6 10L M6 25L M6 40L	M6	55 70 85	45	10 25 40	0	6.5	12	50	70	6.5	5.0	44-015 44-020 44-025
M8 10L M8 25L M8 40L	M8	65 80 95	50	10 25 40	0	9.0	14	55	80	15	7.5	44-055 44-060 44-065
M10 10L M10 25L M10 50L M10 75L	M10	75 90 115 140	60	10 25 50 75	0	11	16	65	100	27	13	44-105 44-110 44-115 44-120
M12 10L M12 25L M12 40L M12 60L	M12	90 105 120 140	75	10 25 40 60	0	13	20	85	120	50	23	44-155 44-160 44-165 44-170
M16 15L M16 30L M16 60L	M16	135 150 180	115	15 30 60	0 10 30	17	25	125	190	120	-	44-205 44-210 44-215
M20 60L M20 100L	M20	195 235	130	60 100	25 60	22	32	140	220	230	-	44-255 44-260
M24 100L M24 150L	M24	255 300	150	100 150	25 100	26	38	160	240	400	-	44-305 44-310

# RAWL® Rawlbolt® Shield Anchor Loose Bolt

## 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 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.

By using spacers the anchor can be set at increased depths which will generally improve the tensile performance. This option should be considered for substrates of lower strength than 25N/mm<sup>2</sup>.

### Brickwork

Loads shown are for 20.5N/mm<sup>2</sup> brick. The anchor should be positioned a minimum of 300mm from the vertical edge of the wall and four courses down from the top of an unrestrained wall. Installing the anchor into mortar joints should be avoided.

### Edge and Spacing Distances (concrete only)

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.

### Combined Load (concrete only)

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

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

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

## Performance Data at Standard Embedment Depth

SIZE	CONCRETE 30N/mm <sup>2</sup> (C20/25)									BRICKWORK 20.5N/mm <sup>2</sup>		
	SAFE WORKING LOAD (kN)			FAILURE LOAD (kN)			CHARACTERISTIC EDGE DISTANCE (mm)				CHARACTERISTIC SPACING DISTANCE (mm)	SAFE WORKING LOAD (kN)
	Tension	Shear		Tension	Shear		Tension	Shear				
		5.8G	8.8G		5.8G	8.8G		5.8G	8.8G		Tension & Shear	Tension & Shear
M6	3.3	4.4	6.8	12.2	9.7	14.9	80	80	100	120	1.8	
M8	4.8	5.6	8.7	15.4	12.4	19.0	100	100	120	150	2.3	
M10	6.2	8.9	13.7	21.2	19.6	30.2	120	120	160	180	2.9	
M12	9.7	12.9	19.9	30.9	28.5	43.8	160	160	180	250	4.3	
M16	21.3	24.1	36.9	73.1	53.0	81.3	190	190	260	290	Bolts above M12 are not recommended in brickwork	
M20	31.2	37.5	60.0	100.5	82.6	132.0	250	250	300	330		
M24	38.0	54.1	86.6	125.5	119.0	190.5	280	280	350	420		

### Reduction Factors - Edge and Spacing Distances for Bolt Projecting and Loose Bolt

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 for 8 . 8 Grade Bolts (Concrete) Spacing (Concrete)

EDGE (mm)	TENSILE : EDGE REDUCTION FACTORS							EDGE (mm)	SHEAR : EDGE REDUCTION FACTORS						
	M6	M8	M10	M12	M16	M20	M24		M6	M8	M10	M12	M16	M20	M24
50	0.70							60	0.50						
60	0.80	0.70						70	0.64						
70	0.90	0.80	0.70					80	0.76	0.50					
80	1.0	0.90	0.80	0.70				100	1.0	0.75	0.50				
100		1.0	0.90	0.78	0.70			120		1.0	0.69	0.50			
120			1.0	0.85	0.78	0.70		160			1.0	0.85			
140				0.93	0.85	0.76	0.70	170				0.93	0.50		
160				1.0	0.93	0.82	0.76	180			1.0	0.55			
190					1.0	0.88	0.82	220				0.76	0.50		
220						0.94	0.88	260				1.0	0.75	0.50	
250						1.0	0.94	300					1.0	0.75	
280							1.0	350						1.0	

SPACING (mm)	TENSILE & SHEAR REDUCTION FACTORS						
	M6	M8	M10	M12	M16	M20	M24
60	0.70						
80	0.80	0.70					
100	0.90	0.80	0.70				
120	1.0	0.90	0.80	0.70			
150		1.0	0.90	0.78	0.70		
180			1.0	0.85	0.78	0.70	
210				0.93	0.85	0.78	0.70
250				1.0	0.93	0.85	0.76
290					1.0	0.93	0.82
330						1.0	0.88
370							0.94
420							1.0

For reduction factors for 5.8 grade bolts see page 5  
For Installation see back cover