Powers FASTENERS®

Blue-Tip SCREW-BOLT™

zero expansion
one piece
completely removable

Edition: April 2011

Powers offers the widest range of mechanical and adhesive fasteners in the market place. Powers products cover the full traditional anchoring range while specialising in innovative products that provide the architect, engineer and end user with aesthetic, high performance, labour saving fastening solutions.
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Other Powers fastening systems

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High performance.
Fast cure
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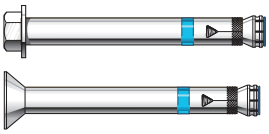
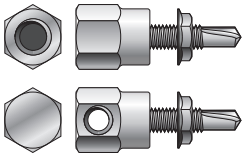
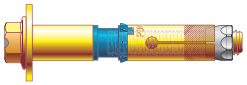


Power-Bolt®
Heavy duty
Self-undercut design
Vibration resistant



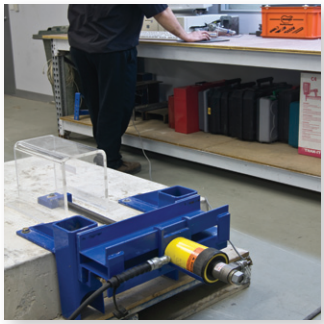
Vertigo™
One piece
Various styles



PBI BRACE-IT anchor
High performance
Economical
Versatile

Support

Training Facility
Melbourne



In-house Product & Application Testing Service
Melbourne

National on Site Anchor Testing Service

National On Site Service
Powers Training Vehicles (PTV)

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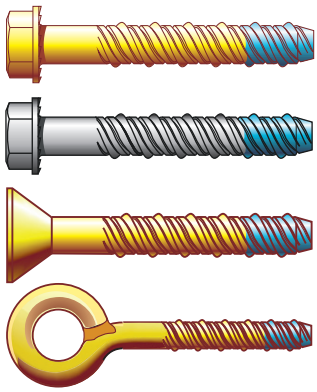
Blue-Tip SCREW-BOLT™

Introduction

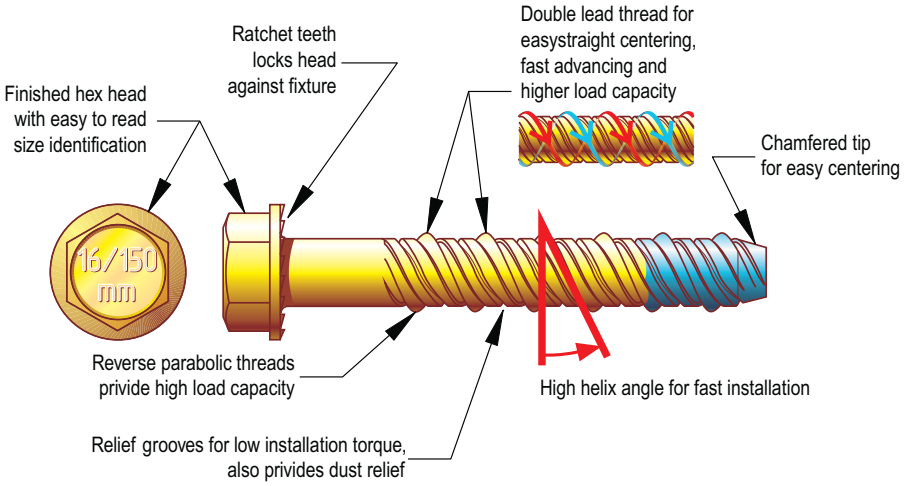


Blue -Tip SCREW-BOLT™ anchors have many unique features and benefits that make this innovative anchor well suited for almost every application. Optimum performance is obtained using a combination of patented design concepts. The benefit to the designer is higher load capacities while the benefit to the user is easy and fast installation.steel.

Description

Blue-Tip SCREW-BOLT™ anchor

Blue -Tip SCREW-BOLT™ anchors are one-piece units featuring a finished hex head formed with an integral washer, a patented dual lead thread, and a chamfered tip. Blue -Tip SCREW-BOLT™ anchors cut a thread into the base material. Since there are no expansion forces, the Blue -Tip SCREW-BOLT™ anchor can be installed closer to the edge than traditional mechanical anchors without damaging the base material.



Blue -Tip SCREW-BOLT™ anchors are designed to match standard fixture holes that are 2mm over nominal to provide a secure fit. Since the Blue -Tip SCREW-BOLT™ is specifically matched to the clearance hole, the need for hole layout is eliminated and can be used in a variety of base materials.

Blue -Tip SCREW-BOLT™ anchors can be installed at a shallower embedment than traditional wedge or sleeve anchors reducing the chance of striking reinforcing bars or embedded cables. Blue -Tip SCREW-BOLT™ anchors are designed with a patented double lead, elliptical profile thread to facilitate easy centering, faster installation and higher load capacities

Blue -Tip SCREW-BOLT™ anchors are vibration resistant. Unlike traditional anchors that have a small expansion mechanism, the double lead threads grip the base material over the full embedment length and there are no expansion forces to pulverise the concrete. For additional vibration resistance, the ratchet teeth on the underside of the hex washer head lock against the fixture.effort in all base materials.

Material specifications

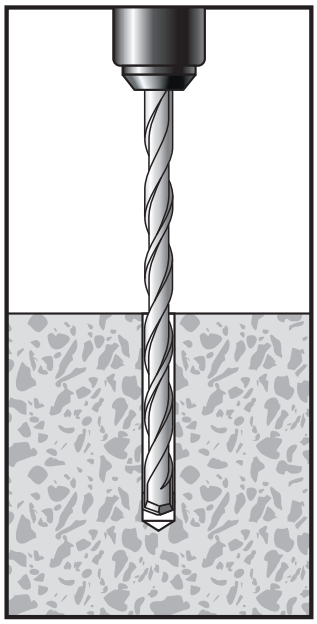
Blue -Tip SCREW-BOLT™ anchors are manufactured from heat treated carbon steel that is plated with commercial bright zinc, and a supplementary yellow chromate treatment in accordance with AS1789–2003.

Anchor Specification:

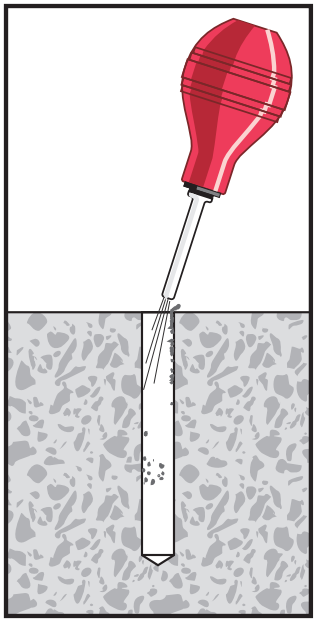
Anchor body	AISI 1020 /1040 carbon steel (heat treated)
Plating (zinc)	5 microns (minimum)
Plating (galvanised)	*25 microns (minimum) GALZIN® coating. (Zinc Alum corrosion resistant coating applied by mechanical plating process.)

* GALZIN® corrosion resistant coating is superior to hot dipped galvanised coating. (Refer to GALZIN® brochure.)

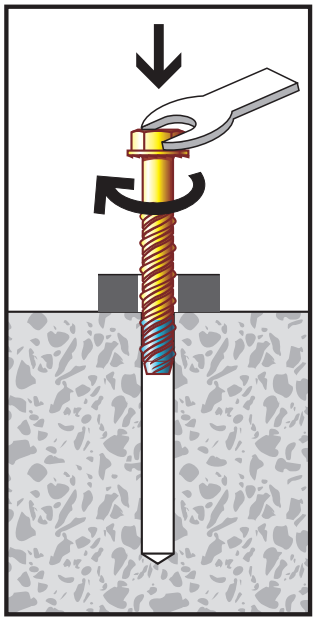
Installation procedures

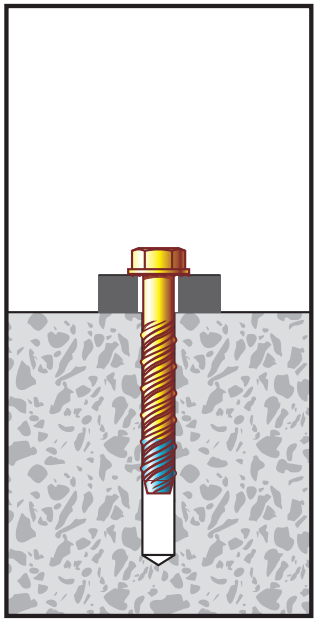


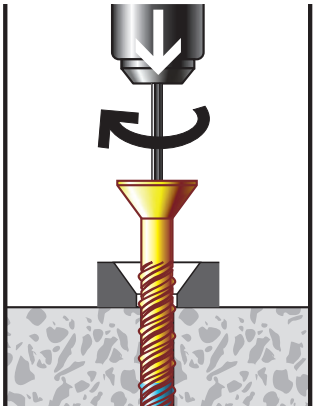
Using the proper diameter bit, drill a hole into the base material to a depth of at least 13mm or one anchor diameter deeper than the embedment required.

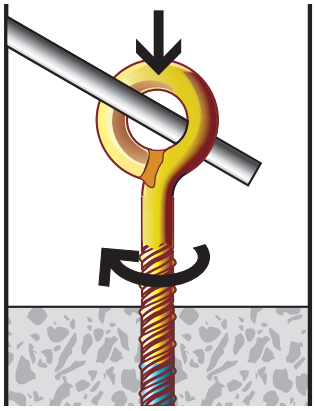


Blow the hole clean of dust and other material.









Installation tips:

1. Use quality hexagonal socket with a ratchet spanner.
2. Where substrate allows, a torque controlled impact wrench can be used.
3. During installation debris or dust created by the thread cutting action may cause some resistance to be experienced. This is easily overcome by unscrewing the Blue -Tip SCREW-BOLT™ for one turn, or more and then continue to fix to the full embedment.

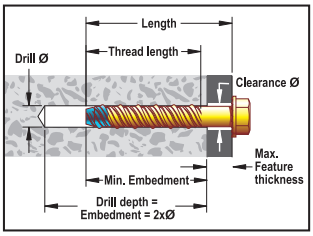
Insert the anchor through the fixture into the anchor hole.
Begin tightening the anchor by applying forward pressure when engaging the first thread.

Additional initial forward pressure may be required for installation in high strength, dense base materials.

Continue tightening the anchor until the head is firmly seated against the fixture.
In extremely dense materials, use of an impact wrench is recommended.

- Be sure the anchor is at the required embedment depth.
- Don't exceed the maximum clamping torque.
- The installation is now complete.

Anchor sizes and styles



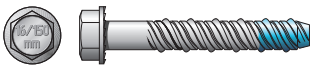
The following table lists the sizes of hex head Blue -Tip SCREW-BOLT™ anchors. To select the proper length; (1), determine the embedment depth required to obtain the desired load capacity (2), add the thickness of the fixture, (including any spacers or shims), to the embedment depth.

Zinc plated carbon steel, hex head Blue-Tip SCREW-BOLT™

Carbon steel Blue-Tip SCREW-BOLT™ anchors are manufactured from carbon steel which is plated with commercial bright zinc and a supplementary chromate treatment.

Part No	Drill Ø mm	Length mm	Thread length mm	Minimum embedment mm	Maximum fixture thickness mm	Clearance hole Ø mm	Box qty	Carton qty
BT550	5	50	44.5	25	25	7	100	500
BT6530	6.5	30	28.5	25	5	8	100	500
BT6550		50	44.5		25		100	500
BT6575		75	70		50		50	250
BT65100		100	95		75		50	250
BT850	8	50	44.5	35	15	10	50	250
BT875		75	70		40		50	250
BT8100		100	95		65		50	250
BT1060	10	60	54	40	20	12	50	250
BT1075		75	70		35		50	250
BT10100		100	95		60		50	250
BT10120		120	95		80		50	250
BT1275	12	75	70	50	25	15	50	150
BT12100		100	95		50		50	150
BT12150		150	95		100		25	75
BT16100	16	100	95	65	35	19	15	60
BT16150		150	95		85		15	60

Carbon steel, mechanically galvanised Blue-Tip SCREW-BOLT™



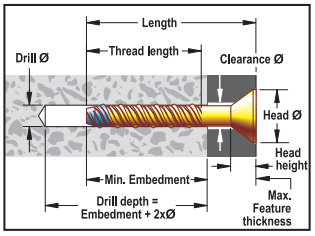
Mechanically plated Blue-Tip SCREW-BOLT™ anchors are manufactured from steel which has a mechanically galvanised coating (GLAZIN®).

Part No	Drill Ø mm	Length mm	Thread length mm	Minimum embedment mm	Maximum fixture thickness mm	Clearance hole Ø mm	Box qty	Carton qty
BTG550	5	50	44.5	25	25	7	100	500
BTG6530	6.5	30	28.5	25	5	8	100	500
BTG6550		50	44.5		25		100	500
BTG6575		75	70		50		50	250
BTG65100		100	95		75		50	250
BTG850	8	50	44.5	35	15	10	50	250
BTG875		75	70		40		50	250
BTG8100		100	95		65		50	250
BTG1060	10	60	54	40	20	12	50	250
BTG1075		75	70		35		50	250
BTG10100		100	95		60		50	250
BTG10120		120	95		80		50	250
BTG1275	12	75	70	50	25	15	50	150
BTG12100		100	95		50		50	150
BTG12150		150	95		100		25	75
BTG16100	16	100	95	65	35	19	15	60
BTG16150		150	95		85		15	60

Carbon steel, Countersunk Blue-Tip SCREW-BOLT™

Carbon steel Blue-Tip SCREW-BOLT™ anchors are manufactured from carbon steel which is plated with commercial bright zinc and a supplementary chromate treatment.

The following table lists the sizes of Countersunk Blue -Tip SCREW-BOLT™ anchors. To select the proper length; (1), determine the embedment depth required to obtain the desired load capacity (2), add the thickness of the fixture, to the embedment depth.

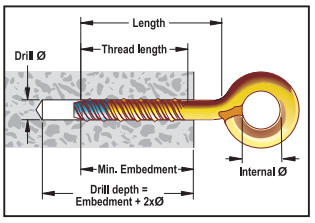


Part No	Drill Ø mm	Length mm	Thread length mm	Head Ø mm	Head height mm	Hex drive	Min. embed. mm	Maximum fixture thickness mm	Clearance hole Ø mm	Box qty	Carton qty
BTCSK06550	6.5	50	44.5	16	6.5	A/F5mm	25	25	7	100	500
BTCSK06575		75	70					50		50	250
BTCSK0850	8	50	44.5	20	8.0	A/F6mm	35	15	10	50	250
BTCSK0875		75	70					40		50	250
BTCSK08100		100	95					65		50	250
BTCSK1060	10	60	54	24.5	9.5	A/F8mm	40	20	12	50	250
BTCSK1075		75	70					35		50	250
BTCSK10100		120	95					60		50	250
BTCSK1275	12	75	70	27.5	10.5	A/F10mm	50	25	15	50	150
BTCSK12100		100	95					50		50	150
BTCSK12150		150	95					100		25	75

Carbon steel, Blue-Tip SCREW-BOLT™, Eyebolt

Carbon steel Blue-Tip SCREW-BOLT™ Eyebolt anchors are manufactured from carbon steel which is plated with commercial bright zinc and a supplementary chromate treatment.

The following table lists the sizes of Blue -Tip SCREW-BOLT™ Eyebolt anchors. To select the proper length, determine the embedment depth required to obtain the desired load capacity.



Part No	Drill Ø mm	Length mm	Thread length mm	Internal Ø mm	Box qty	Carton qty
BTEYE06550	6.5	50	44.5	12.7	100	500
BTEYE08055	8	55	44.5	15.2	50	250
BTEYE10065	10	65	54	17	50	250
BTEYE12075	12	75	70	21.6	50	150

Performance data

Mechanical properties

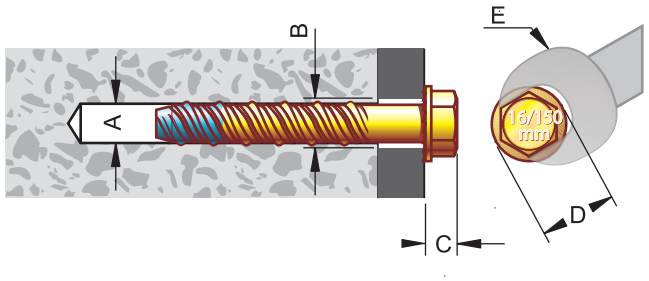
Blue-Tip SCREW-BOLT™ is manufactured using carbon steel that is heat treated to form a surface hardened high performance concrete anchor.

The heat treatment process ensures:

- a high strength and wear resistant surface providing easy, consistent and safe installation even in high compressive strength base materials
- increased core strength and toughness for impact and cyclic loading applications

Mechanical Properties	Units	5	6.5	8	10	12	16
Nominal tensile strength f_u	N/mm²	1000	1000	1000	1000	1000	1000
Yield strength f_y	N/mm²	900	900	900	900	900	900
Stress cross sectional area A_s	mm²	11.1	21.1	38.5	60.7	82.7	153.8
Section modulus Z	mm³	5.2	13.7	33.5	66.6	106.1	269.1
Nominal moment capacity M_f	N/m	4.7	12.3	30.2	59.9	95.5	242.2

Installation specification



A Anchor Ø mm	B Clearance hole Ø mm	C Flanged head height mm	D Washer Ø mm	E Wrench size mm
5	7	5	12	7
6.5	8	6	13	10
8	10	8	17	13
10	12	9.5	22	17
12	15	11.5	25	19
16	19	13.2	30	24

Maximum clamping force (Nm)

Blue -Tip SCREW-BOLT™ anchors achieve their load capacity by threads undercutting the base material. It is not necessary to tighten the anchor to any special torque value. The table shows the maximum permissible torque value to be used to clamp the fixture to the base material.

Base material	Anchor Ø					
	5	6.5	8	10	12	16
15 MPa Concrete	5	7	15	55	80	100
30 MPa Concrete	8	15	45	55	80	100
40 MPa Concrete	8	15	45	55	80	100
Grout filled block	8	15	15	20	55	80
Solid red brick	8	15	15	40	80	100

Performance data – concrete

Working stress design – concrete

Allowable working load capacities for carbon steel Blue-Tip SCREW-BOLT™							
ANCHOR Ø mm	EMBED. DEPTH mm	15 MPa concrete		32 MPa concrete		40 MPa concrete	
		Tension kN	Shear kN	Tension kN	Shear kN	Tension kN	Shear kN
5	25	0.6	0.8	0.9	1.7	1.0	2.0
6.5	25	1.5	1.4	2.5	2.8	2.6	3.3
	30	2.4	3.4	3.0	3.8	3.2	3.8
	45	3.3	3.7	5.0	4.0	5.9	4.5
8	35	3.0	3.5	4.0	4.8	4.3	6.3
	40	3.5	4.5	4.7	6.1	5.2	6.7
	60	5.9	6.4	7.4	6.4	9.7	6.7
10	40	3.9	4.9	4.9	6.6	5.6	9.9
	50	4.8	6.6	6.0	8.5	7.0	9.9
	75	7.4	8.3	9.5	8.7	11.8	9.9
	90	9.3	9.8	12.3	10.0	14.7	10.2
12	50	6.7	8.8	7.3	9.9	8.8	12.0
	60	7.1	10.0	9.2	11.4	10.6	12.3
	90	10.6	11.6	17.4	12.6	18.7	12.6
	110	10.7	11.6	19.5	12.9	20.5	12.9
16	65	6.8	10.5	9.3	15.2	11.3	18.3
	75	8.2	13.5	11.0	17.1	13.0	19.2
	100	13.0	18.3	17.4	20.5	20.2	21.2
	125	17.5	22.0	23.5	23.7	27.1	23.7

NOTE: Incorporated safety factor (Tension and shear) F_{sc}=3 (concrete).

Note:
Performance data is based on tests conducted in un-reinforced concrete of specified cylinder compressive strength.

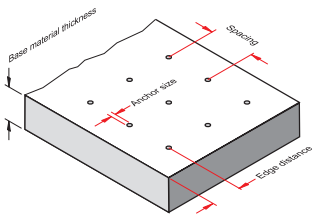
Limit state design – concrete

Limit state design capacities for carbon steel Blue-Tip SCREW-BOLT™							
ANCHOR Ø mm	EMBED. DEPTH mm	15 MPa concrete		32 MPa concrete		40 MPa concrete	
		Tension kN	Shear kN	Tension kN	Shear kN	Tension kN	Shear kN
5	25	1.1	1.5	1.6	3.0	1.9	3.5
6.5	25	2.6	2.5	4.4	5.1	4.7	5.9
	30	4.3	6.2	5.4	6.9	5.7	6.9
	45	5.9	6.7	9.0	7.1	10.6	8.1
8	35	5.3	6.4	7.3	8.6	7.8	11.3
	40	6.3	8.2	8.5	11.0	9.4	12.1
	60	10.7	11.5	13.3	11.5	17.5	12.1
10	40	7.1	8.8	8.8	11.8	10.0	17.8
	50	8.6	11.9	10.9	15.4	12.5	17.8
	75	13.3	14.9	17.1	15.7	21.2	17.8
	90	16.8	17.6	22.1	17.9	26.5	18.4
12	50	12.1	15.8	13.1	17.8	15.9	21.6
	60	12.8	17.9	16.6	20.6	19.1	22.1
	90	19.1	20.8	31.4	22.7	33.6	22.7
	110	19.3	20.8	35.0	23.2	37.0	23.2
16	65	12.2	18.9	16.8	27.4	20.3	32.9
	75	14.8	24.4	19.7	30.8	23.5	34.6
	100	23.5	32.9	31.3	37.0	36.4	38.2
	125	31.4	39.6	42.2	42.7	48.8	42.7

NOTE: Incorporated strength reduction factor (Tension and shear) ϕ = 0.6.

Note:
Performance data is based on tests conducted in un-reinforced concrete of specified cylinder compressive strength.

Design criteria – Concrete



Base material thickness

The minimum recommended thickness of solid base material, BMT, is 125% of the embedment to be used. For example, when installing an anchor to a depth of 100mm, the base material thickness should be 125mm.

Spacing between anchors

To obtain the maximum load in tension or shear, a spacing, S, of 10 anchor diameters (10d) should be used. The minimum recommended anchor spacing, S, is 5 anchor diameters (5d) at which point the load should be reduced by 50%. The following table lists the load reduction factor, Rs, for each anchor diameter, d, based on the center to center anchor spacing.

ANCHOR HOLE SIZE Ø mm	Spacing distance, S (mm) Tension and Shear					
	10d	9d	8d	7d	6d	5d
5	50	45	40	35	30	25
6.5	65	58.5	52	45.5	39	32.5
8	80	72	64	56	48	40
10	100	90	80	70	60	50
12	120	108	96	84	72	60
16	160	144	128	112	96	80
Rs	**1.00**	**0.90**	**0.80**	**0.70**	**0.60**	**0.50**

Edge distance – Tension

An edge distance, E, of 10 anchor diameters (10d) should be used to obtain the maximum tension load. The minimum recommended edge distance, E, is 3 anchor diameters (3d) at which point the tension load should be reduced by 28%. The following table lists the load reduction factor, Re, for each anchor diameter, d, based on the anchor centre to edge distance.

ANCHOR HOLE SIZE Ø mm	Edge distance, E (mm) Tension only							
	10d	9d	8d	7d	6d	5d	4d	3d
5	50	45	40	35	30	25	20	15
6.5	65	58.5	52	45.5	39	32.5	26	19.5
8	80	72	64	56	48	40	32	24
10	100	90	80	70	60	50	40	30
12	120	108	96	84	72	60	48	36
16	160	144	128	112	96	80	64	48
Re(t)	**1.00**	**0.96**	**0.92**	**0.88**	**0.84**	**0.80**	**0.76**	**0.72**

Edge distance – Shear

For shear loads, an edge distance, E, of 10 anchor diameters (10d) should be used to obtain the maximum load. The minimum recommended edge distance, E, is 3 anchor diameters (3d) at which point the shear load should be reduced by 84%. The following table lists the load reduction factor, Re, for each anchor diameter, d, based on the anchor centre to edge distance.

ANCHOR HOLE SIZE Ø mm	Edge distance, E (mm) Shear only							
	10d	9d	8d	7d	6d	5d	4d	3d
5	50	45	40	35	30	25	20	15
6.5	65	58.5	52	45.5	39	32.5	26	19.5
8	80	72	64	56	48	40	32	24
10	100	90	80	70	60	50	40	30
12	120	108	96	84	72	60	48	36
16	160	144	128	112	96	80	64	48
Re(s)	**1.00**	**0.88**	**0.76**	**0.64**	**0.52**	**0.40**	**0.28**	**0.16**

Performance data – masonry

Working load capacities for grout filled block (kN)

Anchor Ø mm	Embedment depth mm	Tension	Shear
5	30	0.5	0.8
6.5	65	2.9	1.9
8	80	3.2	3.1
10	90	4.3	4.8
12	100	6.1	8.9
16	100	7.7	14.2

NOTE: Incorporated safety factor (Tension and shear) F_{SC}=3 (concrete).

400 x 200 x 200mm block
Manufacturer: NUBRIK
Block compressive strength: 12MPa
Grout compressive strength: 20MPa

Limit state design capacities for grout filled block (kN)

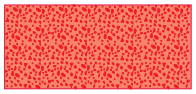
Anchor Ø mm	Embedment depth mm	Tension	Shear
5	30	0.9	1.4
6.5	65	5.2	3.4
8	80	5.8	5.5
10	90	7.7	8.7
12	100	10.9	16.
16	100	13.9	25.5

NOTE: Incorporated strength reduction factor (Tension and shear) ϕ = 0.6.

Working load capacities for solid pressed red brick (kN)

Anchor Ø mm	Embedment depth mm	Tension	Shear
5	35	3.1	1.7
6.5	40	4.6	2.2
8	50	6.5	4.2
10	60	7.7	5.7
12	75	11.2	10.5
16	80	13.3	16.1

NOTE: Incorporated safety factor (Tension and shear) F_{SC}=3 (concrete).



230 x 110 x 76mm
Manufacturer; NUBRIK
Brick compressive strength: 40MPa

Limit state design capacities for solid pressed red brick (kN)

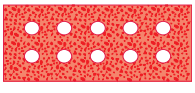
Anchor Ø mm	Embedment depth mm	Tension	Shear
5	35	5.5	3.1
6.5	40	8.2	4.0
8	50	11.8	7.5
10	60	13.9	10.3
12	75	20.2	19.0
16	80	24.0	29.0

NOTE: Incorporated strength reduction factor (Tension and shear) ϕ = 0.6.

Working load capacities for 10 hole extruded wire cut brick (kN)

Anchor Ø mm	Embedment depth mm	Tension	Shear
5	25	0.3	0.6
6.5	65	0.7	1.3
8	65	1.0	2.1
10	65	1.0	3.3

NOTE: Incorporated safety factor (Tension and shear) F_{SC}=3 (concrete).



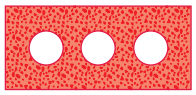
230 x 110 x 76mm
Manufacturer; BORAL
Brick compressive strength: 15MPa

Limit state design capacities for 10 hole extruded wire cut brick (kN)

Anchor Ø mm	Embedment depth mm	Tension	Shear
5	25	0.5	1.0
6.5	65	1.3	2.3
8	65	1.8	3.8
10	65	1.9	5.9

NOTE: Incorporated strength reduction factor (Tension and shear) ϕ = 0.6.

Working load capacities for 3 hole extruded wire cut brick (kN)



230 x 110 x 76mm
Manufacturer; BORAL
Brick compressive strength: 55MPa

Anchor Ø mm	Embedment depth mm	Tension	Shear
5	40	2.5	1.8
6.5		5.7	2.2
8		6.5	3.8
10		7.8	5.6
12		8.7	9.2

NOTE: Incorporated safety factor (Tension and shear) F_{SC}=3 (concrete).

Limit state design capacities for 3 hole extruded wire cut brick (kN)

Anchor Ø mm	Embedment depth mm	Tension	Shear
5	40	4.4	3.2
6.5		10.3	4.0
8		11.8	6.8
10		14.0	10.0
12		15.7	16.5

NOTE: Incorporated strength reduction factor (Tension and shear) ϕ = 0.6.

Note: The consistency of brick and block walls varies greatly. Load capacities listed above are based on actual tests conducted in brick and block walls with M3 specification mortar (1 : 1 : 6, AS3700)
Capacities should be used as guidance only.

Design criteria – Masonry (Brick and Blockwork)

- When fixing into brickwork or blockwork, position anchors a minimum of 300mm from an edge or opening.
- Anchors should be positioned four brick & 2 block courses down from the top of an unrestrained wall
- Minimum recommended spacing between anchors is 200mm
- Embedment should be limited to within 30mm of the remote face of the block / brick
- Avoid fixing into mortar joints

Combined loading

Anchors loaded in both tension and shear must satisfy the following equations:

Working stress design

$$\left(\frac{T_S}{T_A}\right)^{5/3} + \left(\frac{S_S}{S_A}\right)^{5/3} \leq 1$$

Where:

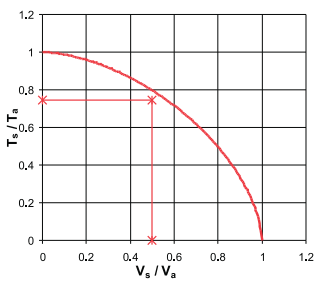
T_S= Applied Tension Load
T_A= Allowable Tension Load
S_S= Applied Shear Load
S_A= Allowable Shear Load

Limit state design

$$\left(\frac{N^*}{\phi N_A}\right)^{5/3} + \left(\frac{V^*}{\phi V_A}\right)^{5/3} \leq 1$$

Where:

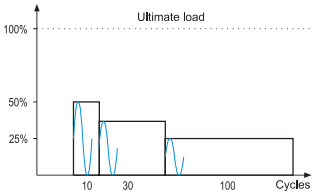
N^* = Design Tension Force
ϕN_A= Design Tension Anchor Capacity
V^* = Design Shear Force
ϕV_A= Design Shear Anchor Capacity



Anchors for use in Seismic/Cyclic applications

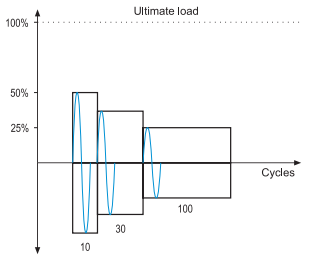
The selection and suitability of anchoring systems for seismic applications should be determined by a design professional in accordance with relevant building codes and standards. To assist in selecting the correct anchoring system, Powers Fasteners have conducted independent seismic tests on the Blue -Tip SCREW-BOLT™ anchor highlighting its suitability.

Chart 1



Earthquakes can induce loads in anchoring systems well in excess of their allowable working load levels. Evaluating the suitability of the Blue -Tip SCREW-BOLT™ involved subjecting the anchor to a simulated seismic test program in accordance with ICBO Evaluation Services Inc. (USA Standard). Load cycles are shown in Chart1 and 2 (Frequency 1Hz). Load was applied sinusoidally between a load no greater than 5% of the ultimate load and the required cyclic load level.

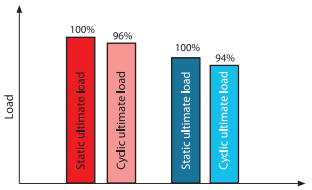
Chart 2



Acceptance criteria in accordance with ICBO Evaluation Services Inc. AC01 (USA Standard) is as follows:

- ***Anchor must withstand the loading cycles without failure***
- ***Anchor must be able to attain at least 80% of the static ultimate tension or shear capacity***
- ***Blue -Tip SCREW-BOLT™passed both criteria, refer chart 3.***

Chart 3



Blue -Tip SCREW-BOLT™

TRADAC SCREW-BOLT™

Description

The TRDAC SCREW-BOLT™ is a quick and simple system,which provides timber frame top plate tie-down to slabs for residential timber frame construction without the costly time consuming requirements of chemical anchoring systems. Its unique thread design provides an undercutting effect in the concrete ensuring optimum performance in residential slabs at minimal edge distance (e.g.35mm).

Material Specification

TRADAC SCREW-BOLT™ anchors are manufactured from heat treated carbon steel that is plated with commercial bright zinc, and a supplementary yellow chromate treatment in accordance with AS1789–2003.

Anchor Specification:

Anchor body	AISI 1020 /1040 carbon steel (heat treated)
Zinc plating	5 microns (minimum)

Sizes

Anchor size mm	Drill Ø mm	Rod size mm	Length mm
TRDAC 12100 12x100	12	M12	100
TRDAC 12150 12x150	12	M12	150

Load capacities

Limit state design – Timber frame construction (35mm timber frame)

Uplift capacity of wall frame tie-down connections using Powers connectors

Position of tie-down connection		Uplift capacity (kN)					
Top or Bottom plates to slab		Unseasoned timber			Seasoned timber		
Anchor size	Min.Edge Dist. mm	J2	J3	J4	JD4	JD5	JD6
12x100mm	35	10	10	10	10	10	10
	≥45	11	11	11	11	11	11
12x150mm	35	17	17	17	17	16	12
	≥45	18	18	18	18	16	12

50 x 50 x 3.0 (min) washer to be used with the 12 mm TRDAC SCREW-BOLT™
NOTE: For bottom plates greater than 35mm but 50mm or less in thickness, Limit State Design uplift capacities listed above shall be multiplied by 0.85.
TRDAC SCREW-BOLT™ uplift capacities have been derived in accordance with AS 1684-1999 requirements for top or bottom plates to slab tie down connections.

Limit state design – Steel frame construction

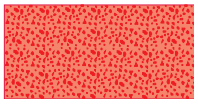
Position of tie-down connection		Uplift capacity (kN)
Top or Bottom plates to slab		
Anchor size	Min.Edge Dist. mm	
12x100mm	35	17.0
	≥45	18.0

50 x 50 x 3.0 (min) washer to be used with the 12 mm TRDAC SCREW-BOLT™
Uplift capacities are based on installation in accordance with Powers Fasteners installation instructions in 20MPa concrete and at 95mm embedment.
The designer responsible for the tie-down application also should consider the steel frame strength in their calculation.

Suitable base materials

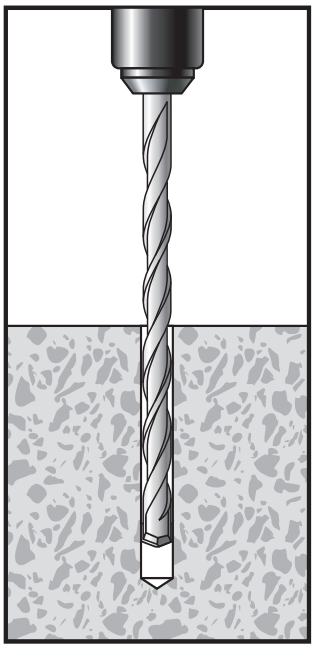

Concrete

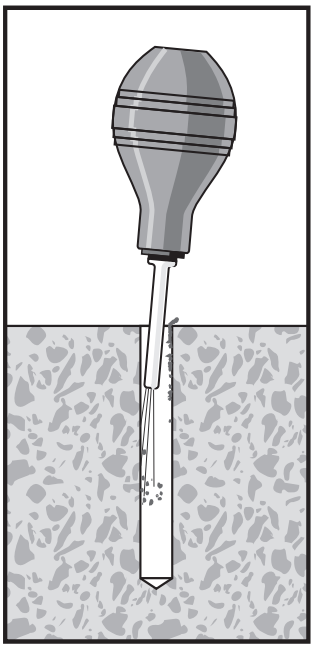

Block

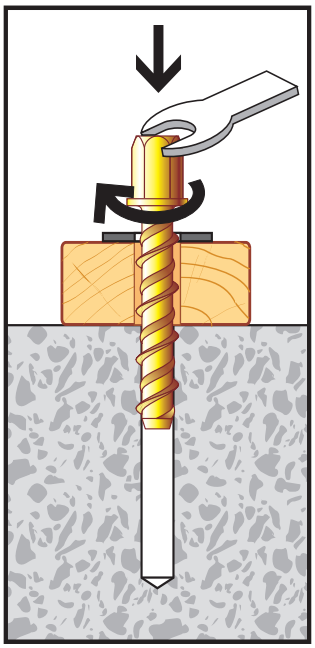

Brick

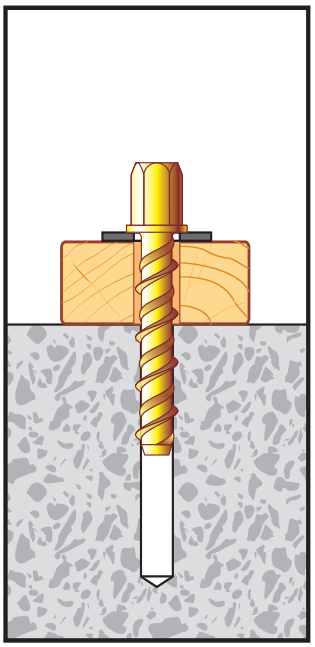

Stone

Installation procedures


Using the proper diameter bit, drill a hole into the base material to a depth of at least one to two anchor diameters deeper than the embedment required.


Blow the hole clean of dust and other material.


Insert the anchor through the fixture into the anchor hole
Begin tightening the anchor by applying forward pressure when engaging the first thread.
Additional initial forward pressure may be required for installation in high strength, dense base material.
Continue tightening the anchor until the head is seated against the fixture.
In extremely dense materials, use of an impact wrench is recommended.
The installation is now complete.


Installation tips:
Use quality hexagonal socket with a ratchet spanner
Where substrate allows, a torque controlled impact wrench can be used.
During installation debris or dust created by the thread cutting action may cause some resistance to be experienced. This is easily overcome by unscrewing the TRDAC 12100 SCREWBOLT™ for one turn, or more and then continue to fix to the full embedment

Suggested specification

	Example
Product name	Blue-tip SCREW-BOLT
Head style	Hex head
Part number	BT12150
Size	12 x 150
Embedment depth	50mm
Minimum spacing and edge distance	Spacing: 120mm, Edge distance: 120mm
	Product to be installed in accordance with published installation procedure

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