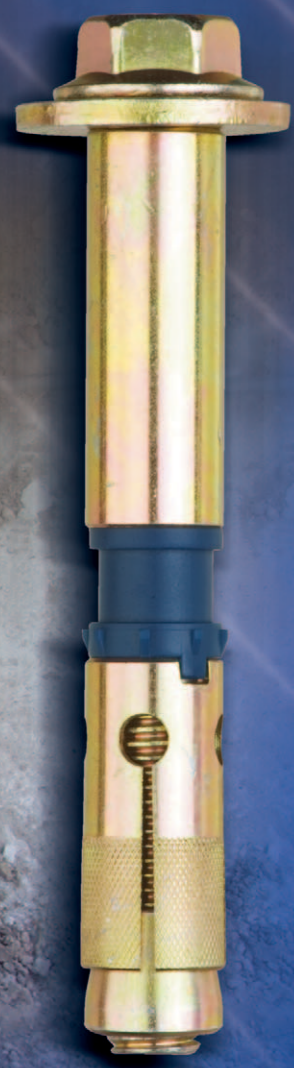


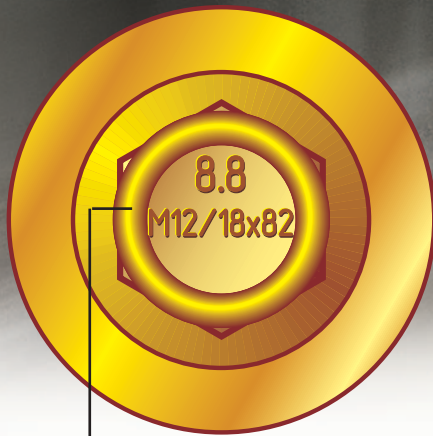
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STRUCTURAL ANCHOR

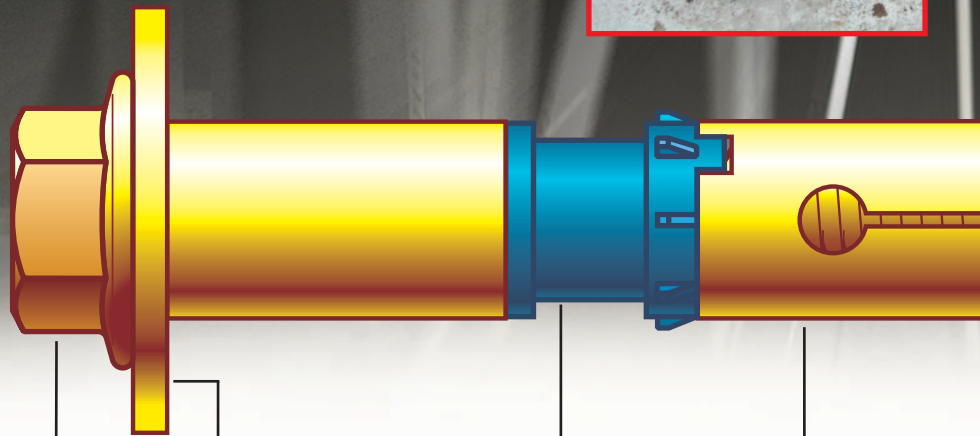


PBI Structural Anchor



Unique head markings for easy product traceability and effective on site inspection

Flanged hex head class 8.8 bolt for high performance in both tension and shear applications. Flanged head provides increased bearing of anchor and washer against fixture.



Heavy-duty large diameter washer suitable for oversized fixture clearance holes

Nylon compression ring ensures positive grip of anchor in drilled hole. Compression ring also provides fixture clamp down against base material for dynamic loading applications.

Thick expansion sleeve generating high slip resistance and maximum lateral wedging effect in drilled hole

1. Load Controlled Expansion Anchors for brace fixing

M12 / Ø 18 - PBI Structural Anchor Specification Data

| | | |
|-------------------------|--------------------------------|--|
| Product: | PBI Structural Anchor | |
| Part No.: | PBI18-17/102LE or PBI18-27/127 | |
| Sizes: | 18 x 102mm & 18 x 127mm | |
| Bolt: | M12 (class 8.8) | |
| Drill Dia.: | 18mm | |
| Embed. Depth: | 82mm & 107mm | |
| Anchor Spacing: | 180mm (nominal) | |
| Anchor Edge Distance: | 216mm (nominal) | |
| Fixture Thickness: | 20mm (nominal) | |
| Fixture Clearance Hole: | 20 to 22mm | |
| Tightening torque: | 80 Nm | |

Performance in 20 MPa Concrete

| | | |
|---------|--|---------|
| Tension | First Slip Load (0.1mm): | 22.9 kN |
| | R_{WLL} (0.65 x First Slip Load): | 14.9 kN |
| Shear | R _{(S)A} Anchor Allowable Working Load: | 23.1 kN |

M14 / Ø 20 - PBI Structural Anchor Specification Data

| | | |
|-------------------------|--------------------------------|--|
| Product: | PBI Structural Anchor | |
| Part No.: | PBI 20-17/102 or PBI 20-27/127 | |
| Sizes: | 20 x 102mm & 20 x 127mm | |
| Bolt: | M14 (class 8.8) | |
| Drill Dia.: | 20mm | |
| Embed. Depth: | 82mm & 107mm | |
| Anchor Spacing: | 200mm (nominal) | |
| Anchor Edge Distance: | 240mm (nominal) | |
| Fixture Thickness: | 20mm (nominal) | |
| Fixture Clearance Hole: | 22 to 24mm | |
| Tightening torque: | 120 - 140 Nm | |

Performance in 20 MPa Concrete

| | | |
|---------|--|---------|
| Tension | First Slip Load (0.1mm): | 35.6 kN |
| | R_{WLL} (0.65 x First Slip Load): | 23.1 kN |
| Shear | R _{(S)A} Anchor Allowable Working Load: | 27.2 kN |

2. Load controlled expansion anchors for structural connections

Allowable Working Load Performance Data

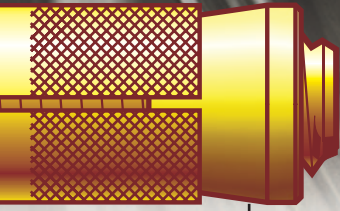
| Part No. | Size mm | Bolt size | Drill dia. mm | Clearance hole mm | Torque setting Nm | Embed depth mm | 40 MPa Concrete | | Panel thickness (Minimum) mm |
|-----------------|----------|-----------|---------------|-------------------|-------------------|----------------|-----------------|------------|------------------------------|
| | | | | | | | Tension (kN) | Shear (kN) | |
| PBI 18-12/82 LE | 18 x 82 | M 12 | 18 | 20 - 22 | 80 | 70 | 11.2 | 16.7 | 100 |
| PBI 18-17/102LE | 18 x 102 | | | | | 85 | 13.7 | 23.1 | 125 |
| PBI 18-27/127 | 18 x 127 | | | | | 100 | 19.4 | 23.1 | 125 |
| PBI 20-17/102 | 20 x 102 | M 14 | 20 | 22 - 24 | 120 - 140 | 85 | 23.6 | 29.3 | 125 |
| PBI 20-27/127 | 20 x 127 | | | | | 100 | 27.7 | 37.6 | 125 |

Never drill deeper than 80% of panel thickness, always clean the drilled hole and always use the correct length load controlled expansion anchor. This will prevent blow out in panels and eliminate costly repairs.





The new Proprietary PBI Structural Anchor is a heavy-duty thick sleeve expansion anchor. It is vibration resistant and removable. The anchor is available in a flange hex head version and can be used in concrete, stone and some types of solid brick and core filled blockwork. The anchor diameter of the PBI structural anchor is the same as the drilled hole, which eliminates layout or hole spotting.



Hardened Tapered cone with optimum geometric design for maximum anchor expansion

The PBI Structural Anchor is a torque (load) controlled thick sleeve expansion anchor, which is suitable for all applications requiring high performance with minimal slip. Its unique design ensures efficient load carrying capacity in both tension and shear.

Powers Fasteners have tested the PBI Structural Anchor in accordance with AS 3850 –2003 (Tilt-up concrete construction standard) for bracing of tilt-up concrete panels.

AS 3850 – 2003 states that where expansion anchors are to be used as brace fixing or structural connection fixing inserts they shall be of the load-controlled type and the WLL (Working Load Limit) shall be limited to 0.65 of the first slip load.

Typical Applications:

- Bracing of Tilt-up concrete panels
- Structural connections including column bases, beam supports etc.
- Scaffolding tie back to concrete and masonry
- Heavy machinery

3. Anchor Design Criteria

The minimum recommended thickness of base material, BMT, when using the PBI Structural Anchor 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 and edge distance criteria listed below should be considered when calculating the performance capabilities of the PBI Structural Anchor.

ANCHOR SPACING

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 factors, Rs for each diameter d, based on the centre to centre anchor spacing.

| Anchor Hole Size d (mm) | Anchor Spacing, S (mm) Tension and Shear | | | | | |
|-------------------------|--|------|------|------|------|------|
| | 10d | 9d | 8d | 7d | 6d | 5d |
| 18 | 180 | 162 | 144 | 126 | 108 | 90 |
| 20 | 200 | 180 | 160 | 140 | 120 | 100 |
| Rs | 1.00 | 0.90 | 0.80 | 0.70 | 0.60 | 0.50 |

EDGE DISTANCE – TENSION

An edge distance, E, of 12 anchor diameters (12d) should be used to obtain the maximum tension load. The minimum recommended edge distance, E, is 5 anchor diameters (5d) at which point the tension load should be reduced by 20%. 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 d (mm) | Edge Distance, E (mm) Tension only | | | | | | | |
|-------------------------|------------------------------------|------|------|------|------|------|------|------|
| | 12d | 11d | 10d | 9d | 8d | 7d | 6d | 5d |
| 18 | 216 | 198 | 180 | 162 | 144 | 126 | 108 | 90 |
| 20 | 240 | 220 | 200 | 180 | 160 | 140 | 120 | 100 |
| Re | 1.00 | 0.97 | 0.94 | 0.91 | 0.89 | 0.86 | 0.83 | 0.80 |

EDGE DISTANCE – SHEAR

For shear loads, an edge distance, E, of 12 anchor diameters (12d) should be used to obtain the maximum load. The minimum recommended edge distance, E, is 5 anchor diameters (5d) at which point the shear load should be reduced by 50%. 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 d (mm) | Edge Distance, E (mm) Shear only | | | | | | | |
|-------------------------|----------------------------------|------|------|------|------|------|------|------|
| | 12d | 11d | 10d | 9d | 8d | 7d | 6d | 5d |
| 18 | 216 | 198 | 180 | 162 | 144 | 126 | 108 | 90 |
| 20 | 240 | 220 | 200 | 180 | 160 | 140 | 120 | 100 |
| Re | 1.00 | 0.93 | 0.86 | 0.79 | 0.71 | 0.64 | 0.57 | 0.50 |

4. Combined Loading

Anchors loaded in both Tension & Shear shall be designed to satisfy -

$$(F_{(T)S.W.L} / R_{WLL})^{5/3} + (F_{(S)S.W.L} / R_{(S)A})^{5/3} \leq 1$$

Where;

| | | |
|----------------|---|---------------------------------------|
| $F_{(T)S.W.L}$ | = | Applied service load (tension) |
| R_{WLL} | = | 0.65 x First Slip Load (tension) |
| $F_{(S)S.W.L}$ | = | Applied service load (shear) |
| $R_{(S)A}$ | = | Anchor allowable working load (shear) |

5. PBI Structural Anchor Material Specifications

| Anchor Components – Carbon Steel | |
|----------------------------------|--|
| Bolt | Class 8.8 (UTS = 800 MPa min. / Y.S. = 640MPa min.) |
| Washer | C1040 (heat treated) |
| Expander Sleeve | C1022 |
| Extension Sleeve | C1022 |
| Expander Cone | C1040 (heat treated) |
| Compression Ring | Nylon |
| Plating | Zinc plated in accordance with AS1789-2003 |
| Head Style | Heavy Hex Flange Head |
| | M12 / O.D. = 26.5mm |
| | M14 / O.D. = 30.5mm |
| Socket Size | M12 / 18 = 18mm socket |
| | M14 / 20 = 21mm socket |



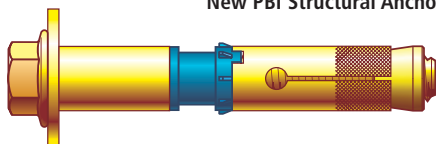
PBI Structural Anchor

Anchors for bracing and structural connection of tilt-up and precast concrete panels



PBI Structural Anchor

New PBI Structural Anchor is a heavy-duty thick sleeve expansion anchor.

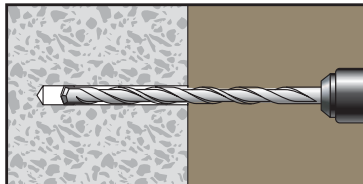


| Part No. | Description | mm | mm | mm | Nm | qty | qty |
|----------------|-------------|----|-----|----|-----|-----|-----|
| PBI18-12/82LE | M12 x 82mm | 18 | 70 | 12 | 80 | 25 | 75 |
| PBI18-17/102LE | M12 x 102mm | 18 | 85 | 17 | 80 | 25 | 75 |
| PBI18-27/127 | M12 x 127mm | 18 | 100 | 27 | 80 | 25 | 75 |
| PBI20-17/102 | M14 x 102mm | 20 | 85 | 17 | 120 | 10 | 40 |
| PBI20-27/127 | M14 x 127mm | 20 | 100 | 27 | 120 | 10 | 40 |

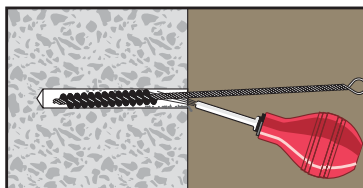


Installation

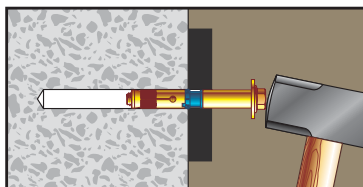
Using the proper diameter bit, drill a hole into the base material to the depth required. This must be no more than 80% of the base material thickness



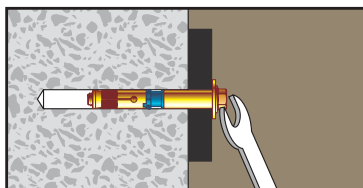
Blow and brush the hole clean of dust and other material. Position the fixture. Do not expand the anchor prior to installation.



Drive the anchor through the fixture into the anchor hole until the bolt head is firmly seated against the fixture. Be sure the anchor is driven to the the required embedment depth.



Tighten the anchor by turning the head 3 to 4 turns or by applying the guide installation torque from the fingertight position



POWERS FASTENERS Victoria - Head Office

Factory 3 / 205 Abbots Rd
Dandenong Sth, 3175
Tel: 03-8787 5888
Fax: 03-8787 5899

New South Wales

Tel: 02-9748 7766
Fax: 02-9648 5977

Queensland

Tel: 07-3216 7122
Fax: 07-3216 7216

Far North Queensland

Fax: 07-4036 4166

South Australia

Tel: 08-8346 5611
Fax: 08-8346 5711

Western Australia

Tel: 08-9209 1211
Fax: 08-9209 1055

New Zealand

Unit 1 / 12 Beatrice Tinsley Cres
Albany, Auckland
Tel: 0011 64-9415 2425
Fax: 0011 64-9415 2627

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