ITW CONSTRUCTION PRODUCTS

CHEMICAL FIXINGS

MECHANICAL FIXINGS

DIRECT FIXINGS

Ramset™

Fastening Solutions

Fire Rated • Cracked Concrete • Seismic Design

Buildex®

spit

MODFIX

Company Profile

ITW is a Fortune 150 diversified manufacturing company that was founded on innovation and expanded on the strength of its customer commitment. For over 100 years, ITW employees have kept an entrepreneurial spirit alive that is firmly focused on its customers. Ramset™, as part of ITW group, is a renowned brand in developing, manufacturing and supplying the latest technology for the construction industry since 1952. Our team of professionals is well supported by ITW technical experts worldwide.

Masters of concrete technology

Ramset expertise in concrete technology includes systems for chemical and mechanical anchoring, drilling, diamond coring, construction chemicals, as well as direct fixing into concrete and steel. Our areas of speciality include: Cracked and non-cracked concrete anchoring systems tested to and compliant with International Standards, front to back of project enginnering design and specification services.

Designed and engineered to work

Ramset minimise design risk and maximise project performance by developing and manufacturing a significant portion of its anchoring systems. Our dedicated approach to product development and manufacturing has resulted in production efficiencies, greater flexibility, the ability to quickly adapt products to project needs and to deliver to the customer in full on time.

Anchoring design services

Ramset provides assistance for qualified design professionals to choose a suitable anchoring solution which meets a project specific set of design inputs such as: Design tools for anchor layouts and calculating performance in grouped anchor configurations, tailored outcomes to suit project specific anchoring and perfomance criteria. Ramset is a quality endorsed company.

Ramset Hong Kong

In order to serve Hong Kong, Macau and Southern China better, RAMSET FASTENERS (HONG KONG) LIMITED is also a channel to provide the best products of different brands under ITW umbrella, including but not limited to ITW Spit, Buildex, Reid, Modfix, Miska and Danley.

ITW Quality Construction Brands

Ramset™ — Performance Engineered anchoring, drilling and fixing systems

spit — International approved anchoring, drilling and fixing systems

reid™ — Lifting, reinforcing, fastening and propping solutions for precast concrete and on site tilt up construction

Buildex® — Self drilling screws and fasteners

MODFIX — Plastic accessories including shimplates

DANLEY Systems — Industrial concrete flooring and pavement construction systems specialist

miska — Expansion joint solutions for civil and architectural construction projects

Contents

More anchor selections are available in full product guide

Different Types of Anchors

Torque Setting Expansion Anchors

Expansion is achieved by the application of torque to a bolt or nut which causes a cone to be drawn into a sleeve. Anchorage is verified with this torque.

Displacement Setting Expansion Anchors

Expansion is achieved by hammering a component (normally a cone) which is captive in the body of the anchor. Anchorage is verified by the travel of the expansion component.

Rotation Setting Anchors

Anchorage is achieved by screwing the anchor into the concrete and creating mechanical interlock. Allows reduced spacings and edge distances than for expansion anchors.

Cast-In Anchors

Anchorage is achieved by having the anchor being retained in the hardened concrete by either the enlargement on the base of the anchor, or by a bar located in the cross-hole. Cast-In Anchor allows reduced spacing and edge distances than expansion anchors and eliminates the chance of hitting rebars when comparing to all post-installed anchors.

Chemical Anchors

The anchor consists of a fixing element and a synthetic-based adhesive. The two components are placed in the hole and after curing the adhesive creates dual adhesion, one between the fixing element and the adhesive and the other between the adhesive and base material. The adhesive is supplied either in a glass capsule or an injection cartridge. Chemical anchors generate lower stresses in the base material so they can be used closer to edges and closer together.

Friction Based Light Duty Anchors

Performance is achieved by the introduction of an expansion component which is screwed or hammered into the anchor body. The anchor body is thus firmly blocked against the sides of the drilled hole.

Deformation Based Light Duty Anchors

The anchor body is drawn against the interior of the base material by deformation.

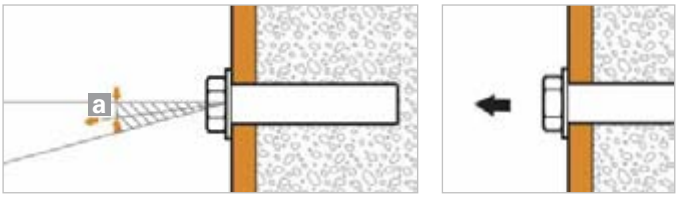
Anchor Systems - Principles of Operation

Hollow or Low Strength Base Materials

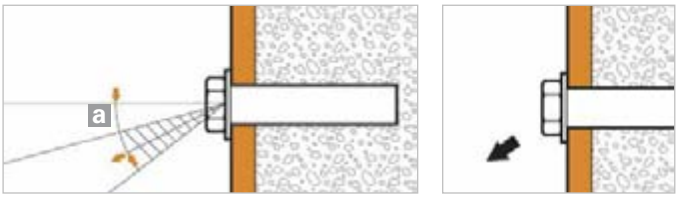
We have stated indicative loads for performance in certain types of masonry, both solid and hollow, while indicating various types. Given the vast selection of different types of bricks and blocks that are encountered on site, it is recommended that adequate site tests be carried out to establish a realistic recommended load for:

Solid concrete block
Solid brick
Hollow concrete block
Hollow brick
Dry wall
Aerated concrete and gypsum block

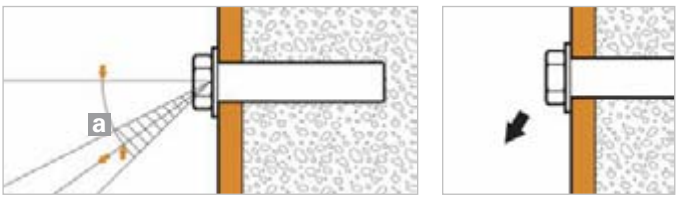
Load Directions - Tensile ($0° \leq a \leq 15°$)



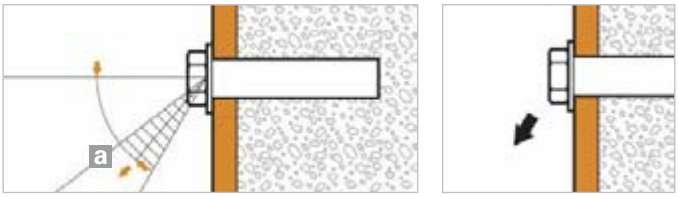
Oblique 30° ($15° < a \leq 37.5°$)



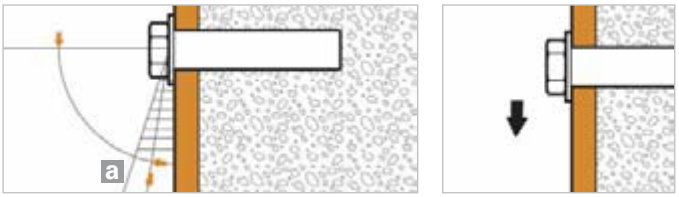
Oblique 45° ($37.5 < a \leq 52.5°$)



Oblique 60° ($52.5° < a \leq 67.5°$)

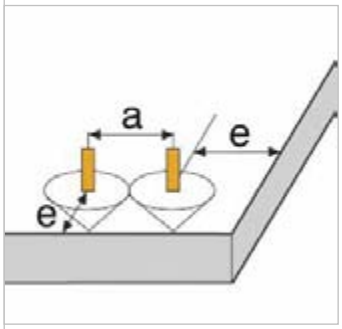


Shear ($67.5° < a \leq 90°$)



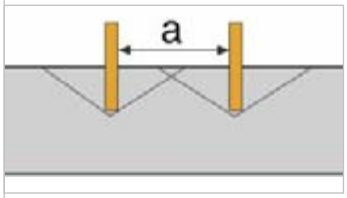
Anchor Spacing

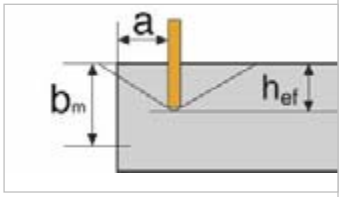
Taking into account the stress values created by the expansion anchors and the loads they are designed to support, the following points must be considered when establishing the performance of each individual product (recommended load):



- The minimum thickness of the base material (b_m) (determined by anchor effective depth h_{ef})
- The minimum distance between anchors (a)
- The distance of anchors from edges of the slab or structure (e)

The coincidence of stress cones of adjacent anchors in concrete reduces their tensile performance.





Anchor Effective Depth: h_{ef}

Each anchor has a minimum anchorage depth which guarantees its minimum rated load (recommended load). Certain anchor types can be embedded deeper with a resulting increase in performance.
For further information consult the Ramset™ Technician.

Reduced Distance Between Anchors

The distance between anchors and from edges and corners can also be reduced in some cases. Such reduction will affect the recommended load of the anchor and one or more reduction coefficients will have to be applied.

Load Classification

Static Load

A load is static when it's constant and stationary.

Vibrating Load

A variable cyclic load of relatively low amplitude and high frequency (motor vibration for example).

Dynamic Load

A variable load in time with a relatively medium or high amplitude with or without negative loading (wind for example).

Shock Load

Isolated high load applied in a very short period of time.

These four load types can be occasional or permanent. An occasional load is applied during a limited period of time and several times. A permanent load is applied continuously.

3D Interface

A userfriendly 3D visual interface

The new one i-Expert software allows you to create 3D design models of all your applications :

- Rectangular, circular, triangular base plates;
- Predefined applications such as safety barriers, brackets, lamp post, metallic stand for framework
- Post installed rebar connections.

A logical and intuitive interface

A logical and intuitive interface

The main menu guides you through the easy to follow steps:

- Selection of the application,
- Definition of the dimensions of the base plate,
- Definition of the concrete base material and the environmental conditions,
- Data input of combined forces ie : tensile, shear, bending moment, torsion moment..

A userfriendly result display

A userfriendly result display

From the resulting display, by using filter you can select the optimal anchor, have access to the resistance tables for the group of anchors, the installation data and edit the calculation sheet in PDF format.

You can also select one anchor and run the manual and automatic optimisation program.

ERT
by SPIT

Design per ETAG

FIND US ON
http://i-expert.spit.com

Custom mode

With the custom mode, i-Expert has no limits

It gives the possibility to design applications with unlimited fixings and defines the position coordinates of each anchor

Calculation method

European calculation method

The new I-Expert software allows you to design according to the following calculation methods :

- Design according to ETAG 001 Annex C (Amended September 2010);
- Design according to Technical Report TR029 (amended September 2010) for chemical anchors with variable embedment);
- Design resistance to fire according to Technical report TR020;
- Design of anchorage under seismic actions according to French CISMA Recommendations;
- Design rebar reinforcement according to Eurocode 2, including the possibility to design to fire and seismic actions.

Checking of the base plate thickness

Finite Elements calculation

I-EXPERT software offers the possibility of creating a design model of the base plate using finite elements in order to check that it is thick enough to guarantee its rigidity.


Ramset
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EPCON G5™ High Strength Epoxy Adhesive

Ramset™

*Suit various design conditions
- Cracked concrete
- Seismic
- 4 hours FRP

Approvals / Listings

ICC-ES EVALUTION REPORT

CSTB fire tested.

- ASTM C881-99, Type IV, Grade 3, Class A, B and C
- ICC Evaluation Service, Inc. 20091BC
- Miami Dade County - #06-0425.02
- DOT Approval
- Florida Building Code FL#14419 Approval
- Warrington Fire Resistance Tests with Rebars BS 476 Part 20 - 1987
- HDB Prefabrication Technology Centre tested
- SETSCO Tests
  NSF/ANSI standard 61 - Drinking water system components

Performance Related

Dynamic Load | Pull down | Cracked Concrete | Fire Resistant | Seismic

Material Specification

GAL Hot dipped Galvanised | A4 316 Stainless Steel | Zn Zinc Plated

Description

EPCON G5™ High Strength Epoxy
A high performance chemical epoxy adhesive. Fast cure with extended working time for use in tropical climate. Works well in dry, damp, wet and flooded holes.

Features and Benefits

Formulated for hot or warm weather

- High strength epoxy
- Fire rated: tested up to 4 hours FRP
- Shorter curing time with extended working time
- Works in damp holes and underwater applications
- Low shrinkage, suitable for cored and oversized holes
- Virtually odorless, can be used indoors
- Easy handling and installations
- Re-sealable tip

Specification

EPCON G5™ is a heavy duty, pure epoxy injection chemical anchor.

Setting characteristics at 27°C:

- Working time: 12 minutes
- Full cure time: 2 hours.

Substrates

- Concrete (cracked and non-cracked)
- Solid block
- Solid brick
- Natural stone

Applications

- Reinforcing and starter bars
- Underwater fixings
- Diaphragm wall fixings
- Guard rail fixings
- Parapet wall fixings
- Tunnel fixings
- Floor slabs

Base Material Temperature (F°/C°)	Working Time	Cure Time
90° / 32°	8.5 minutes	2 hours
80° / 27°	12 minutes	2 hours
70° / 20°	15 minutes	2 hours
60° / 16°	18 minutes	3 hours
50° / 10°	21 minutes	6 hours

Installation temperature

~ Substrate: 5°C to 40°C

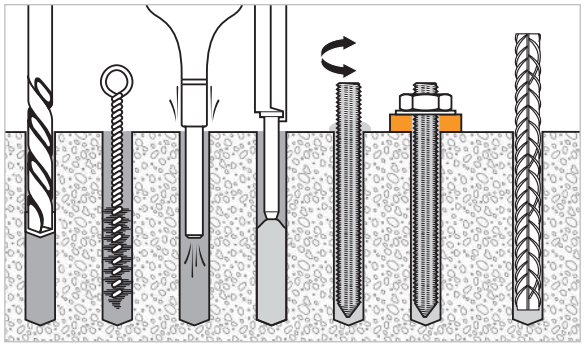
- Load should not be applied to anchor until the chemical has sufficiently cured as specified
- Warming of cartridge required if mortar temperature is below 20°C

Service temperature

-10°C to 80°C

Installation

1. Drill correct diameter hole to recommended depth.
2. Clean hole thoroughly with brush and air pump 3~4 times.
3. Assemble nozzle onto cartridge. Dispense and discard enough chemical until uniform mix is achieved. Inject from the bottom of the hole gradually, filling in until 40% full.
4. Insert the rod/stud or rebar by hand to full depth, using slow rotating movement.
5. Allow EPCON G5 to cure for specified period before loading.



Product Range - EPCON G5™ Epoxy Resin Adhesive

Part No.	Description	Order Qty
G5	EPCON G5 (650ml)	6
E55	E55 Nozzle	24
E102	E102 Dispensing Tool	1
E202	Pneumatic Dispenser Tool E202	1

EPCON G5™ - Recommended Working Loads in 40N/mm² non-cracked Concrete - Anchor Studs

Thread Ø	Hole Ø (mm)	Fixture Hole Ø (mm)	Embedment Depth (mm)	Hole Depth (mm)	Torque (Nm)	Shear Load (kN)	Tension Load (kN)
M8	10	10	80	80	10	5.3	6.3
M8	10	10	100	100	10	5.3	8.0
M10	12	12	90	90	20	8.4	13.1
M10	12	12	110	110	20	8.4	16.0
M12	14	15	110	110	30	12.1	19.1
M12	14	15	150	150	30	12.1	26.0
M16	18	19	125	125	60	22.5	30.4
M16	18	19	190	190	60	22.5	46.2
M20	24	24	170	170	120	36.5	43.1
M20	24	24	250	250	120	36.5	63.3
M24	28	28	210	210	200	52.7	56.9
M24	28	28	280	280	200	52.7	75.9
M30	35	35	280	280	400	83.9	84.6
M30	35	35	380	380	400	83.9	114.8

* Safety factor for all loads = 3
* This table does not consider edge distance and anchor spacing effects. Please refer to Ramset Design Guide for more information
* Recommended shear load is limited by anchor stud grade 8.8 refer to ISO 898-i:2009(E). For loading of other material grade, please contact Ramset Technical Department.
* Pull out test for single anchor = working load x 1.5
* For cracked concrete design condition or anchor size larger than M30, please contact Ramset for further support.

Rebar Fixing with EPCON G5 - for loading and installation, please refer to following pages.

STRENGTH LIMIT STATE DESIGN (Rebar Fixing)

RAMSET CHEMSET INJECTION SYSTEM - EPCON G5
METHOD STATEMENT FOR
INSTALLATION OF REBARS

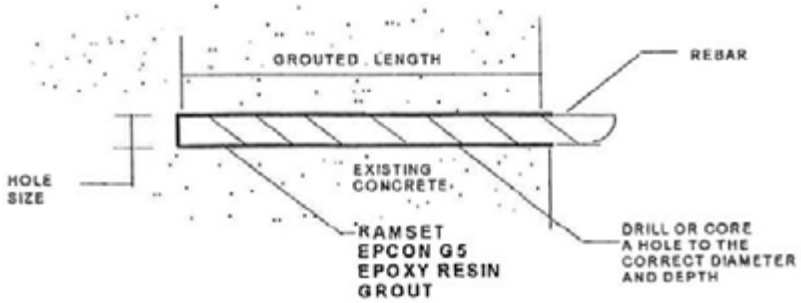
BAR DIA	HOLE SIZE	GROUTED LENGTH	CHAR. ULT. TENSILE LOAD as per BS5080 Part 1	*YIELD STRENGTH OF 460N/mm² HIGH YIELD DOWEL BAR*	*YIELD STRENGTH OF 500N/mm² HIGH YIELD DOWEL BAR*
Y10	12 mm	100 mm	46.8 kN	*36.1 kN*	*39.3 kN*
Y12	16 mm	120 mm	57.8 kN	*52.0 kN*	*56.6 kN*
Y16	20 mm	160 mm	103.7 kN	*92.5 kN*	*100.5 kN*
Y20	25 mm	200 mm	167.9 kN	*144.5 kN*	*157.1 kN*
Y25	30 mm	250 mm	255.4 kN	*225.8 kN*	*245.4 kN*
Y32	40 mm	320 mm	431.5 kN	*369.9 kN*	*402.1 kN*
Y40	48 mm	400 mm	630.5 kN	*578.0 kN*	*628.3 kN*
Y50	62 mm	500 mm	982.0 kN	*903.2 kN*	*981.8 kN*

* It is based on non-cracked concrete with strength 30MPa.

- Please apply appropriate factor of safety to get your design working load.
- Pull Out Test Per BS5080: Part 1 had been performed on full range of high yield dowels bar of yield strength 460N/mm². Characteristic tensile capacity for Y50 is derived from the test load of Y50 with 480mm embedment depth (per BS5080 Part 1 clause 7.1).
- No load reduction to be applied for installation conditions including dry, water-saturated，water-filled, and underwater applications.
- For design condition considering cracked concrete, please contact Ramset Technical Department for more information.
- **For design condition under 1-4 hours FRP, please refer to the following pages.**

Installation Procedure

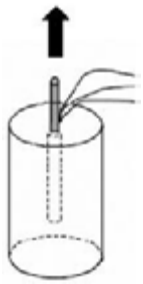
1) Drill a hole to the correct diameter and depth for particular rebar size being installed.
2) Wire brush the hole using wire brush, blow out all dust with forced air and leave no slurry.
3) Insert nozzle and fill the hole to at least one third its depth. When starting new cartridges or new nozzle，dispense and discard enough adhesive until uniform light grey colored is achieved.
4) Before the G5 gels, insert rebar into the bottom of hole with a slow twisting motion. Wipe off the excess resin if necessary.
5) After the G5 has fully cured, attach the fixture.



Warrington Fire Test Report

UP TO 4 HOURS FIRE RESISTANCE TEST PERFORMED ON REBAR GROUTED USING RAMSET EPCON G5 AT SPLICE OR ANCHORAGE CONNECTION TO BS 476 PART 20-1987

WFRA is NATA accredited. Two sets of fire tests under different concrete joint connection have been carried out to assess bond stress model that quantifies the relationship between bond stress and temperature for deformed bars anchored with RAMSET EPCON G5 when exposed to fire. The bond stress model is based on withdrawal tests of various bar diameters from heated concrete cylinders in addition to a fire test of a representative section of a loaded wall to slab as well as slab to slab connections exposed to heating regime of BS 476 Part 20. Briefly, the overall testing procedures conducted by Warrington Fire Research Centre can be illustrated as follows:



(1) Cylinder test: Pull out tests of full range of bar diameters (from 012 to 040) from heated concrete cylinders at different temperature were performed.

(2) Bond stress model: By comparing various heated temperatures and pull out force， temperature dependence bond stress model was obtained. Note that temperature based on was the temperature of coldest end of bar to gives conservative bond stress model.

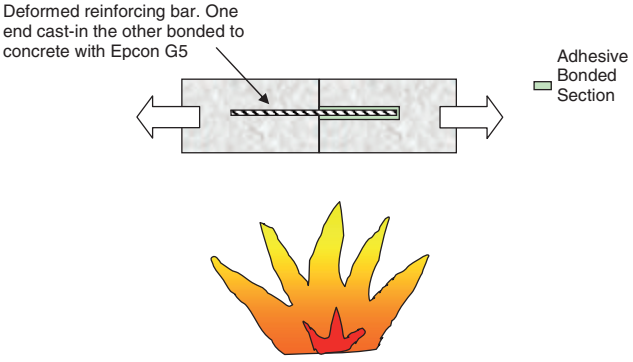
(3) FEM: At the same time, with the help of finite element analysis of model TASEF， temperature at various covers and a range of slab/element thickness for periods of exposure between 30 minutes and four hours to the BS476:Part 20-1987 heating regime, were obtained.

(4) Full scale 4 hours Fire-resistance test in accordance with BS476:Part 20: Taking Splice Connection Test as an example, 2 reinforced slabs were connected by 2 nos of Y16 rebars, one end bonded to concrete with EPCON G5 and the one end cast-in. Based on concrete cover and slab thickness, temperature was obtained from finite-element modelling (FEM) as in (3). Consequently, bond stress was calculated using the bond stress model and applied loading was determined with reference to bond length, temperature dependence bond stress and bar diameter used in the full scale test.

(5) FEM validation: Temperature probe were installed at various location to validate the temperature indicate by FEM. Therefore, temperature obtained from FEM can be confidently used to tabulate bond stress at different combinations of concrete cover and slab/element depth.

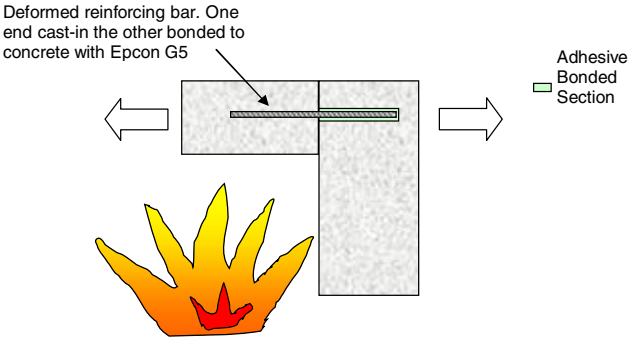
(6) Bond stress model validation: Since slab splice joint did not failed after 4 hours fire test with the loading derived from bond stress model and loading has been increased up to 6 times higher to reach failure mode, the bond stress model is again proved to be very conservative.

For details, please refer to WRFA Report No.45832.3 for test under splice joint condition & WRFA Report No.45838.4 for test under anchorage joint condition.



Loaded Stad Heated to BS 476 Part20

WFRA Report No. 45832.3



Loaded Anchorage Connection Heated to BS 476 Part20

WFRA Report No. 45838.4

ChemSet™ Anchor Studs - Features and Benefits

- Grade 5.8 Carbon Steel - 500 MPa Steel Capacity
- High Corrosion resistant AISI 316(A4) Stainless Steel
- Hot Dip Galvanised to 45µm min
- External Hex Drive for reliable socket fit
- Depth Set Mark to ensure correct embedment
- Bevelled tip to prevent unthreading
- High quality finish

Material

Zn | GAL | A4 316

ChemSet™ Anchor Studs - Zinc Plated 6µm minimum 45° Single Cut

Part No.	Description	Anchor Size (mm)	Stud Length (mm)	Max Fixture Thickness (mm)	Drilled Hole Ø (mm)	Min Hole Depth (mm)	Order Qty
CS08110	CS08110 Chemset Studs	8	110	15	10	80	10
CS10130	CS10130 Chemset Studs	10	130	20	12	90	10
CS12160	CS12160 Chemset Studs	12	160	25	14	110	10
CS16190	CS16190 Chemset Studs	16	190	35	18	125	10
CS20260	CS20260 Chemset Studs	20	260	65	25	170	6
CS24300	CS24300 Chemset Studs	24	300	63	28	210	6
CS30380	CS30380 Chemset Studs	30	380	70	35	280	5

ChemSet™ Anchor Studs - Hot Dipped Galvanised 45µm minimum 45° Single Cut

Part No.	Description	Anchor Size (mm)	Stud Length (mm)	Max Fixture Thickness (mm)	Drilled Hole Ø (mm)	Min Hole Depth (mm)	Order Qty
CS08110GH	CS08110GH Chemset Studs	8	110	15	10	80	10
CS10130GH	CS10130GH Chemset Studs	10	130	20	12	90	10
CS12160GH	CS12160GH Chemset Studs	12	160	25	14	110	10
CS16190GH	CS16190GH Chemset Studs	16	190	35	18	125	10
CS20260GH	CS20260GH Chemset Studs	20	260	65	25	170	6
CS24300GH	CS24300GH Chemset Studs	24	300	63	28	210	6
CS30380GH	CS30380GH Chemset Studs	30	380	70	35	280	5

ChemSet™ Anchor Studs - Stainless Steel A4 316 45° Single Cut

Part No.	Description	Anchor Size (mm)	Stud Length (mm)	Max Fixture Thickness (mm)	Drilled Hole Ø (mm)	Min Hole Depth (mm)	Order Qty
CS08110SS	CS08110SS Chemset Studs	8	110	15	10	80	10
CS10130SS	CS10130SS Chemset Studs	10	130	20	12	90	10
CS12160SS	CS12160SS Chemset Studs	12	160	25	14	110	10
CS16190SS	CS16190SS Chemset Studs	16	190	35	18	125	10
CS20260SS	CS20260SS Chemset Studs	20	260	65	25	170	6
CS24300SS	CS24300SS Chemset Studs	24	300	63	28	210	6
CS30380SS	CS30380SS Chemset Studs	30	380	70	35	280	5

Lead time applies for Chemset™ Anchor Studs. Note: A4-70, A4-80 and Grade 8.8 are available for selection.

ATP Stainless Steel A4 Internal Threaded Socket (to match Epcon C8/G5)

Part No.	Description	Anchor Size (mm)	Anchor Length (mm)	Drilled Hole Ø (mm)	Drilling Depth (mm)	Thread Length (mm)	Order Qty
062860	ATP Socket M8X60 A4	8	60	14	80	25	10
062960	ATP Socket M10X65 A4	10	65	20	90	32	10
063100	ATP Socket M12X75 A4	12	75	24	210	38	10
051175	ATP Socket M16X125 A4	16	125	28	280	50	10

EPCON C8 XTREM Extreme Performance Epoxy Resin

Ramset™

Product from split

Description

Extreme performance resin, specifically formulated for extreme rebar and stud applications. With virtually no odour, New Epcon C8 is easy to inject at low temperatures and is approved for use in wet and diamond drilled holes.

Features and Benefits

- Suitable for cracked concrete
- Suitable for use in oversized holes and diamond drill hole
- Easy to inject at low temperatures
- Reliable performance at high temperature - 100% performance at 60°C, 70% performance at 80°C
- Virtually no odour
- Phenol and Styrene free
- 3 years shelf life - Reduces risks associated with holding stock
- 450ml cartridge
- High performance injection tool - Reduces effort required for application
- Works in damp, wet and submerged hole
- Minimum shrinkage - Improves long term performance in freeze / thaw cycles
- Vibration resistant
- Reduces anchor spacing and edge distances
- Embedment is 8-20d for stud fixing

LOW VOC

Specification

- Pure Epoxy
- Minimal shrinkage: 0.05%
- High bond strength: 20N/mm²
- Intended working life of the anchor: 50 years

Approvals

ETA-10/0309

ETA-07/0189

Transport for London Underground authorised for use.

WRAS approved for the maintenance or installation of water treatment systems and associated applications. Approval number 0901501.

DTA N°3/11-684

NF approved (meets requirements for creep resistance).

CSTB fire tested. 26007642-b per ISO 834

Waterproof

Substrates

- Concrete (cracked and non-cracked)
- Hollow block wall
- Solid stone
- Aerated concrete
- Solid block
- Plasterboard
- Hollow brick
- Hollow block
- Solid block

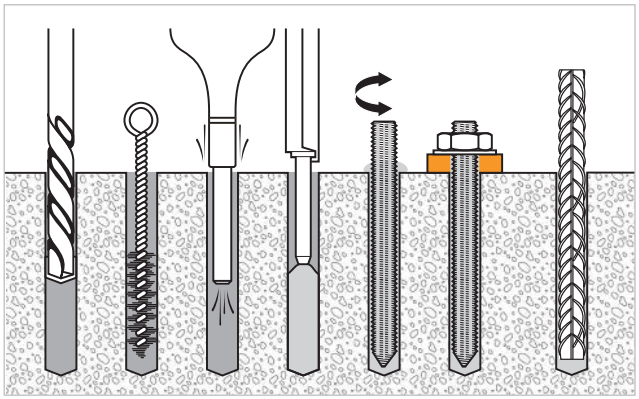
Setting Time

Ambient Temperature (C°)	Max. time for installation	Curing time
40°	5 minutes	6 hours
30°	8 minutes	8 hours
20°	14 minutes	12 hours
10°	20 minutes	23 hours
5°	26 minutes	26 hours

Applications

- Submerged installations
- Installing process & ancillary equipment
- Water treatment
- Pumps and pipework
- Fixing steel framed structures
- Fixing machinery (resistant to vibration)
- Electric insulation (high dielectric strength 10,000V)
- Protective barriers, safety rails
- Rebar installation
- Starter bar installation
- Applications subject to dynamic loads

Installation



1. Drill correct diameter hole to recommended depth.
2. Clean hole thoroughly with brush and air pump 3~4 times.
3. Assemble nozzle onto cartridge. Dispense and discard enough chemical until uniform mix is achieved. Inject from the bottom of the hole gradually, filling in until 40% full.
4. Insert the rod/stud/rebar by hand to full depth, using slow rotating movement.
5. Allow EPCON C8 to cure for specified period before loading.

Product Range - EPCON C8 Extreme Performance Epoxy Resin

C8

050069

050067

055830

051828

Part No.	Description	Order Qty
EPCON C8	EPCON C8 Cartrigde (450ml) + 1 Nozzle + 1 Extension	1
050069	Application Nozzle with Extension (10 nos.)	1
055837	Bag of 10 mixing nozzles	1
050969	Bag of 5 mixing nozzles	1
050067	EPCON C8 450ml Manual Injection Tool - Premium	1
055830	EPCON C8 450ml Manual Injection Tool - Standard	1
370689	Premium Tool Sleeve	1
051828	Pneumatic Injection Tool for EPCON C8	1

EPCON C8 Recommended Working Load in 40 N/mm² Non-cracked Conrete - Anchor Studs

Thread Ø	Hole Ø (mm)	Fixture Hole Ø (mm)	Embedment Depth (mm)	Hole Depth (mm)	Min Thick of Base Material (mm)	Tightening Torque (Nm)	Shear Load (kN)	Tension Load (kN)
M8	10	9	80	80	110	10	5.3	9.7
M10	12	12	90	90	120	20	8.4	15.4
M12	14	14	110	110	140	30	12.1	20.9
M16	18	18	125	125	160	60	22.5	25.3
M20	25	22	170	170	220	120	36.5	40.2
M24	28	26	210	210	265	200	52.7	55.2
M30	35	33	280	280	350	400	83.9	85.0

* These are zinc coated studs, for SS studs see full submission

* Safety factor for all loads = 3
* This table does not consider edge distance and anchor spacing effects. Please refer to Ramset Design Guide for more information.
* Recommended shear load is limited by anchor stud grade 8.8 refer to ISO 898-i:2009(E). For loading of other material grade, please contact Ramset Technical Department.
* Pull out test for single anchor = working load x 1.5

Rebar Fixing with EPCON C8 - for loading and installation, please contact Ramset for full product submission

Approvals

ETA Option 1
no 05/0044

TR 020

XTREM
C1/C2
Seismic approval

Performance Related

Dynamic Load | Pull down | Cracked Concrete | Fire Resistant | Seismic

Material Specification

Zn Zinc Plated | A4 316 Stainless Steel

Features and Benefits

- ETA Option 1 - cracked concrete & seismic zone
- Heavy duty torque controlled anchors for use in concrete over 20MPa
- Through fixing – no marking out and repositioning
- Fully assembled
- Variety of head styles for perfect finishing
- Sleeved through bolt anchor - very high shear loads
- Achieves high pull-out and pull-down force values
- High performance for fixture clamping
- High shear and tensile capacity, Grade 8.8 steel bolt and threaded rod
- Metal "collapse system" sleeve. Patented Z shaped anti-rotation and Z shape shearing
- The patented anti-rotation expansion sleeve is designed with sharp angled protrusions that grip the sides of the hole, preventing anchor rotation during installation. As expansion of the sleeve begins, the locking barbs also grip the sides of the hole, further embedding as expansion progresses, giving extra holding power. The sleeve pulls down during tightening ensuring excellent pressure between the fixture and the concrete.
- The low profile hex or countersunk heads provide a neat finish

Substrates

- Concrete (cracked and non-cracked)
- Hard natural stone

Description

The TRIGA Z XTREM Anchor is a heavy duty, torque controlled expansion anchor, with an integrated pull-down section, designed for high performance in both static and dynamic load applications, in both cracked and non-cracked concrete. The TRIGA Z XTREM Anchor is ideally suited for through fixing into concrete when security and reliability are paramount.

Typical Applications

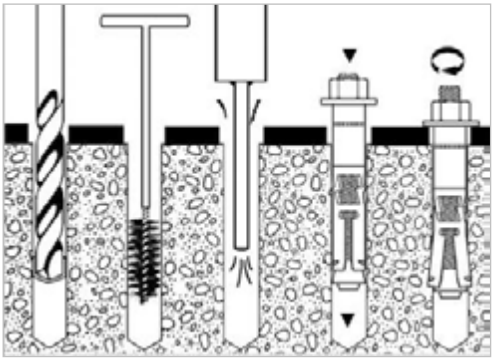
- Structural steel columns
- Steel beams
- Holding down machinery
- Steel bollards
- Industrial doors
- Fixing of pre-cast units

TRIGA Z XTREM Collapse System

During collapse, the Z shapes shears, which enables the upper part of the anchor to move down (bolt, washer and tube). The special Z shape of Triga Z anchors ensures that fixtures are always fit snugly.

Installation

1. Drill the correct diameter hole to the same diameter as the TRIGA Z XTREM stud anchor selected.
2. Remove debris from hole by blowing out with compressed air or hand held blow out pump.
3. Install the anchor in the hole with a hammer until washer seats on fixture.
4. Tighten bolt with a torque wrench to recommended assembly torque



TRIGA Z XTREM Zinc Plated - Recommended Working Loads in 40N/mm² non-cracked Concrete

			Stud Head		Bolt Head & Countersunk	
Thread Ø	Embedment Depth (mm)	Torque (Nm)	Shear Load (kN)*	Tension Load (kN)*	Shear Load (kN)*	Tension Load (kN)*
M6	50	15	4.8	7.5	7.8	7.5
M8	60	25	6.3	8.4	10.9	8.4
M10	70	50	10.3	12.4	16.4	12.4
M12	80	80	15.8	15.2	24.2	15.2
M16	100	120	31.0	21.3	39.1	21.3
M20	125	200	36.6	29.7	57.8	29.7

* Safety factor for all loads = 3
* This table does not consider edge distance and anchor spacing effects. Please refer to Ramset Design Guide for more information.
* Pull out test for single anchor = working load x 1.5

TRIGA Z XTREM Bolt Head - Zinc Plated

Bolt version

- The conventional version,for sleek fixing.

Part No.	Description	Thread Ø	Max Fixture Thickness (mm)*	Fixture Clearance Hole Ø (mm)	Overall Anchor Length (mm)	Drilled Hole Ø (mm)	Min Hole Depth (mm)*	Order Qty	Seismic Approval
050673	V6-10/5	M6	5	12	65	10	70	100	-
050674	V6-10/20	M6	20	12	80	10	70	100	-
050678	V8-12/10	M8	10	14	80	12	80	50	-
050679	V8-12/20	M8	20	14	90	12	80	50	-
053001	V8-12/50	M8	50	14	120	12	80	50	-
050688	V10-15/10	M10	10	17	95	15	90	25	C1/C2
050689	V10-15/20	M10	20	17	105	15	90	25	C1/C2
053003	V10-15/55	M10	55	17	140	15	90	25	C1/C2
050696	V12-18/10	M12	10	20	105	18	105	25	C1/C2
050697	V12-18/25	M12	25	20	120	18	105	25	C1/C2
053004	V12-18/55	M12	55	20	150	18	105	25	C1/C2
050704	V16-24/10	M16	10	26	130	24	131	10	C1/C2
050705	V16-24/25	M16	25	26	145	24	131	10	C1/C2
050710	V16-24/50	M16	50	26	170	24	131	10	C1/C2
050711	V20-28/25	M20	25	31	170	28	157	5	-

* Data based on minimum anchor depth

TRIGA Z XTREM Stud Head - Zinc Plated

Stud Head version

- For removable fixing.

Part No.	Description	Thread Ø	Max Fixture Thickness (mm)*	Fixture Clearance Hole Ø (mm)	Overall Anchor Length (mm)	Drilled Hole Ø (mm)	Min Hole Depth (mm)*	Order Qty	Seismic Approval
050675	E6-10/50	M6	50	12	117	10	70	100	-
050681	E8-12/20	M8	20	14	99	12	80	50	-
050683	E8-12/35	M8	35	14	114	12	80	50	-
050684	E8-12/55	M8	55	14	134	12	80	50	-
050685	E8-12/95	M8	95	14	174	12	80	25	-
050691	E10-15/20	M10	20	17	114	15	90	25	C1/C2
050692	E10-15/35	M10	35	17	129	15	90	25	C1/C2
050693	E10-15/55	M10	55	17	149	15	90	25	C1/C2
050694	E10-15/100	M10	100	17	194	15	90	25	C1/C2
053698	E12-18/25	M12	25	20	132	18	105	25	C1/C2
050699	E12-18/45	M12	45	20	152	18	105	20	C1/C2
050701	E12-18/65	M12	65	20	172	18	105	10	C1/C2
053702	E12-18/100	M12	100	20	207	18	105	10	C1/C2
050706	E16-24/25	M16	25	26	159	24	131	10	C1/C2
050707	E16-24/55	M16	55	26	189	24	131	5	C1/C2
050708	E16-24/100	M16	100	26	234	24	131	5	C1/C2
050712	E20-28/25	M20	25	31	192	28	157	5	-
050713	E20-28/60	M20	60	31	227	28	157	5	-
050714	E20-28/100	M20	100	31	267	28	157	5	-

* Data based on minimum anchor depth

TRIGA Z XTREM Countersunk Head - Zinc Plated

Countersunk version

- Flush the surface

Part No.	Description	Thread Ø	Max Fixture Thickness (mm)*	Fixture Clearance Hole Ø (mm)	Overall Anchor Length (mm)	Drilled Hole Ø (mm)	Min Hole Depth (mm)*	Order Qty	Seismic Approval
050686	TF V8-12/16	M8	16	14	85	12	80	50	-
053002	TF V8-12/26	M8	26	14	95	12	80	50	-
050695	TF V10-15/27	M10	27	17	105	15	90	25	C1/C2
050715	TF V12-18/40	M12	40	20	120	18	105	10	-

* Data based on minimum anchor depth

TRIGA Z Stainless Steel A4 - Recommended Working Loads in 40N/mm² non-cracked Concrete

Thread Ø	Embedment Depth (mm)	Torque (Nm)	Stud Head Shear Load (kN)*	Stud Head Tension Load (kN)*	Bolt Head Shear Load (kN)*	Bolt Head Tension Load (kN)*
M6	50	10			7.2	7.5
M8	60	25	5.5	9.9	10.5	9.9
M10	70	50	9.1	12.5	16.4	12.5
M12	80	80	13.8	15.2	20.0	15.2
M16	95	120	27.1	19.6		

* Safety factor for all loads = 3
* This table does not consider edge distance and anchor spacing effects. Please refer to Ramset Design Guide for more information.
* Pull out test for single anchor = working load x 1.5

TRIGA Z Bolt Head - Stainless Steel A4

Part No.	Description Ø	Thread Thickness (mm)*	Max Fixture Ø (mm)	Fixture Hole Length (mm)	Overall Anchor Ø (mm)	Drilled Hole Depth (mm)*	Min Hole Qty	Order
050694	V6-10/10 A4	M6	10	12	65	10	70	100
050595	V8-12/10 A4	M8	10	14	80	12	80	25
050596	V8-12/30 A4	M8	30	14	100	12	80	25
050601	V10-15/25 A4	M10	25	17	115	15	90	25
050605	V12-18/25 A4	M12	25	20	120	18	105	25

* Data based on minimum anchor depth

TRIGA Z Stud Head - Stainless Steel A4

Part No.	Description	Thread Ø	Max Fixture Thickness (mm)*	Fixture Hole Ø (mm)	Overall Anchor Length (mm)	Drilled Hole Ø (mm)	Min Hole Depth (mm)*	Order Qty
050598	E8-12/45 A4	M8	45	14	124	12	80	50
050604	E10-15/45 A4	M10	45	17	139	15	90	25
050606	E12-18/15 A4	M12	15	20	122	18	105	25
050608	E12-18/45 A4	M12	45	20	152	18	105	20
052940	E16-24/25 A4	M16	25	26	157	24	130	10

* Data based on minimum anchor depth

TRIGA Z Countersunk Head - Stainless Steel A4

Countersunk version

- Flush the surface

Part No.	Description	Thread Ø	Max Fixture Thickness (mm)*	Fixture Hole Ø (mm)	Overall Anchor Length (mm)	Drilled Hole Ø (mm)	Min Hole Depth (mm)*	Order Qty
057902	TF V8-12/30 A4	M8	30	14	100	12	80	50

* Data based on minimum anchor depth

FIX Z XTREM Stud Anchors for Cracked and Non-cracked Concrete

Product from split

Approvals

FIRE TEST FT TR 020

FM APPROVED FIX Z A4 M10

ETA CE European Technical Agrement
ETA Option 1
no 15/0388
(FIX Z XTREM)

ETA CE European Technical Agrement
ETA Option 1
no 04/0010
(FIX Z A4)

XTREM
C1/C2
Seismic approval
for Zn Plated
FIX Z XTREM

Performance Related

Dynamic Load | Pull down | Cracked Concrete | Fire Resistant | Seismic

Material Specification

Zn Zinc Plated | A4 316 Stainless Steel

Description

The FIX Z XTREM Stud Anchor is a true-to-size, heavy duty, torque controlled expansion anchor, for permanent anchoring into standard and hard concrete. Designed for heavy duty anchoring in cracked and non-cracked concrete. Suitable for seismic and fire environments.

Features and Benefits

- 3 legs clip for a better expansion
- 6 lugs for a better fixing in concrete
- Improved efficiency with fewer hammer blows and turns for installation
- "Pull down" capabilities for secure fixings

Substrates

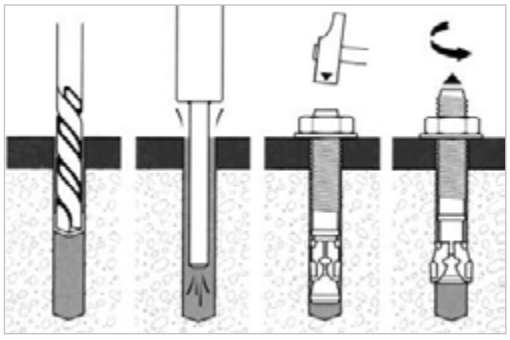
- Concrete (cracked and non-cracked), Solid Stone (applicable with care)

Installation

1. Drill the correct diameter hole to the same diameter as the FIX Z stud anchor selected.
2. Remove debris from hole by blowing out with compressed air or hand held blow out pump.
3. Install the anchor in the hole with a hammer until washer seats on fixture.
4. Tighten bolt with a torque wrench to recommended assembly torque.

Typical Applications

- Structural beams and columns
- Load bearing zones
- Cable trays
- Overhead piping
- Air condition ducts
- Securing of machines and equipment
- Tie back brackets for façade



FIX Z XTREM - Zinc Plated - Recommended Working Loads in 40N/mm² non-cracked Concrete

Thread Ø	Embedment Depth (mm)	Torque (Nm)	Shear Load (kN)*	Tension Load (kN)*
M8	46	20	4.6	3.8
M10	60	45	5.3	8.4
M12	70	60	7.7	12.5
M16	85	110	15.0	16.6
M20	100	160	20.4	21.3

* Safety factor for all loads = 3
* This table does not consider edge distance and anchor spacing effects. Please refer to Ramset Design Guide for more information.
* Pull out test for single anchor = working load x 1.5

FIX Z XTREM Stud Anchors - Zinc Plated

Part No.	Description	Thread Ø	Max Fixture Thickness (mm)*	Fixture Clearance Hole Ø (mm)	Overall Anchor Length (mm)	Drilled Hole Ø (mm)	Min Hole Depth (mm)*	Order Qty	Seismic Approval
057763	M8x65/5	M8	5	9	65	8	60	100	C1
057764	M8x75/15	M8	15	9	75	8	60	100	C1
057765	M8x90/36	M8	30	9	90	8	60	50	C1
057788	M8x130/70	M8	70	9	130	8	60	50	C1
057768	M10x85/5	M10	5	12	85	10	75	50	C1/C2
057769	M10x90/10	M10	10	12	90	10	75	50	C1/C2
057771	M10x120/40	M10	40	12	120	10	75	25	C1/C2
057773	M10x160/80	M10	80	12	160	10	75	25	C1/C2
057774	M12x100/5	M12	5	14	100	12	90	25	C1/C2
057776	M12x115/20	M12	20	14	115	12	90	25	C1/C2
057777	M12x135/40	M12	40	14	135	12	90	25	C1/C2
057778	M12x155/60	M12	60	14	155	12	90	25	C1/C2
057779	M12x180/85	M12	85	14	180	12	90	25	C1/C2
057781	M16x145/25	M16	25	18	145	16	110	10	C1/C2
057782	M16x170/50	M16	50	18	170	16	110	10	C1/C2
057783	M16x180/60	M16	60	18	180	16	110	10	C1/C2
057785	M20x170/30	M20	30	22	170	20	130	10	C1/C2
057787	M20x220/80	M20	80	22	220	20	130	10	C1/C2

* Data based on minimum anchor depth

FIX Z Stainless Steel A4 - Recommended Working Loads in 40N/mm² non-cracked Concrete

Thread Ø	Embedment Depth (mm)	Torque (Nm)	Shear Load (kN)*	Tension Load (kN)*
M6	35	10	2.1	3.0
M8	48	20	3.8	5.1
M10	58	35	6.0	6.8
M12	70	50	8.7	6.8
M16	86	100	15.2	12.7

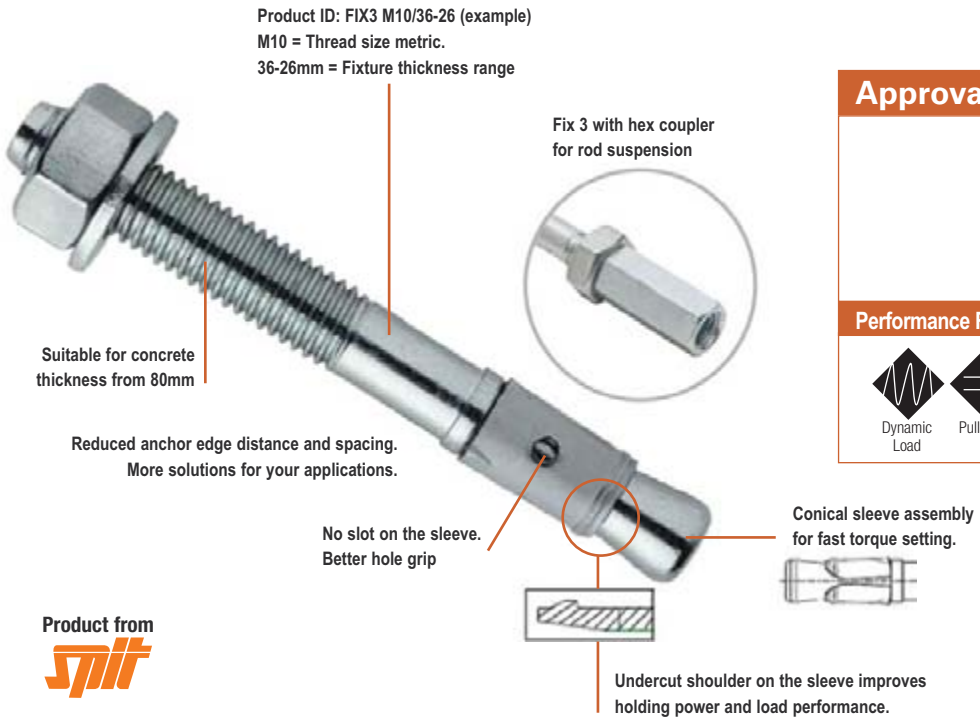
* Safety factor for all loads = 3
* This table does not consider edge distance and anchor spacing effects. Please refer to Ramset Design Guide for more information.
* Pull out test for single anchor = working load x 1.5

FIX Z A4 Stud Anchors - Stainless Steel A4

Part No.	Description	Thread Ø	Max Fixture Thickness (mm)*	Fixture Clearance Hole Ø (mm)	Overall Anchor Length (mm)	Drilled Hole Ø (mm)	Min Hole Depth (mm)*	Order Qty
054270	M6x55/15 A4**	M6	15	8	55	6	41	100
050441	M8x55/5 A4	M8	5	9	55	8	52	100
054610	M8x70/20-7 A4	M8	20	9	70	8	52	100
055343	M8x90/40-27 A4	M8	40	9	90	8	52	100
050367	M8x130/80-67 A4	M8	80	9	130	8	52	50
050466	M10x65/5 A4	M10	5	12	65	10	62	50
054630	M10x75/15 A4	M10	15	12	75	10	62	50
054640	M10x95/35-20 A4	M10	35	12	95	10	62	50
050442	M10x120/60-45 A4	M10	60	12	120	10	62	25
055344	M12x80/5 A4	M12	5	14	80	12	75	25
055345	M12x100/25-6 A4	M12	25	14	100	12	75	25
055394	M12x115/40-21 A4	M12	40	14	115	12	75	25
054680	M12x140/65-46 A4	M12	65	14	140	12	75	25
050443	M16x125/30-8 A4	M16	30	18	125	16	95	25
054700	M16x150/55-33 A4	M16	55	18	150	16	95	10
050444	M16x170/75-53 A4	M16	75	18	170	16	95	10

* Data based on minimum anchor depth
** Not belong to ETA, only for non-cracked concrete

Fix 3™ Multi Purpose Heavy Duty Stud Anchor



Approvals

ETA Option 7
no.13/0005

Performance Related	Material Specification
Dynamic Load, Pull down, Fire Resistant	Zn Zinc Plated

Description

The Fix 3™ Stud Anchor is a true-to-size, heavy duty, multi purpose expansion anchor, for permanent anchoring into concrete. Designed for heavy duty anchoring in non cracked concrete where reduced edge distance and anchor spacing is required. Undercut shoulder on the sleeve improves hole grip and increases load performance.

Features and Benefits

- The Fix 3™ Stud Anchor diameter equals the required hole diameter providing maximum shear capacity for hole size and making drill bit selection simple. Anchor design provides superior strength and reliability.
- The anchor design ensures maximum expansion of the sleeve and pull-down on the fixture. These actions are both further assisted by the application of load.
- The anti-rotation expansion sleeve is designed to grip the sides of the hole, preventing anchor rotation during installation.
- Use threaded couplers where rod suspension applications are required.
- Suitable for installation in concrete from 80mm thick such as pre-fabricated concrete panels.

Substrates

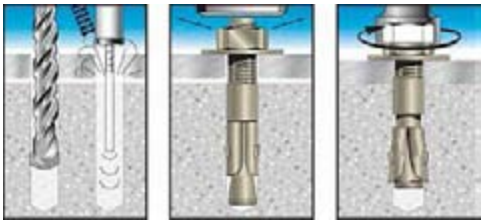
- Concrete

Typical Applications

- Installing curtain walls, balustrades & barriers
- Anchoring elevator guide rails
- Anchoring structural steel columns/beams
- Staduim seating & Pallet racking
- Overhead suspension & Anchoring

Installation

1. Drill a hole to the recommended diameter and depth using the fixture as a template. Clean the hole thoroughly with a hole cleaning brush. Remove the debris with a hand pump, compressed air, or vacuum.
2. Insert the anchor through the fixture and drive with a hammer until the washer contacts the fixture.
3. Tighten the nut with a torque wrench to the specified assembly torque.



Fix 3™ Zn Plated - Recommended Working Loads in 40N/mm² non-cracked Concrete

Thread Ø	Embedment Depth (mm)	Tightening Torque (Nm)	Shear Load (kN)*	Tension Load (kN)*
M8	40	15	3.3	5.4
M10	50	30	4.6	7.5
M12	65	50	9.1	11.1
M16	80	100	12.2	15.2
M20	100	160	23.7	21.3

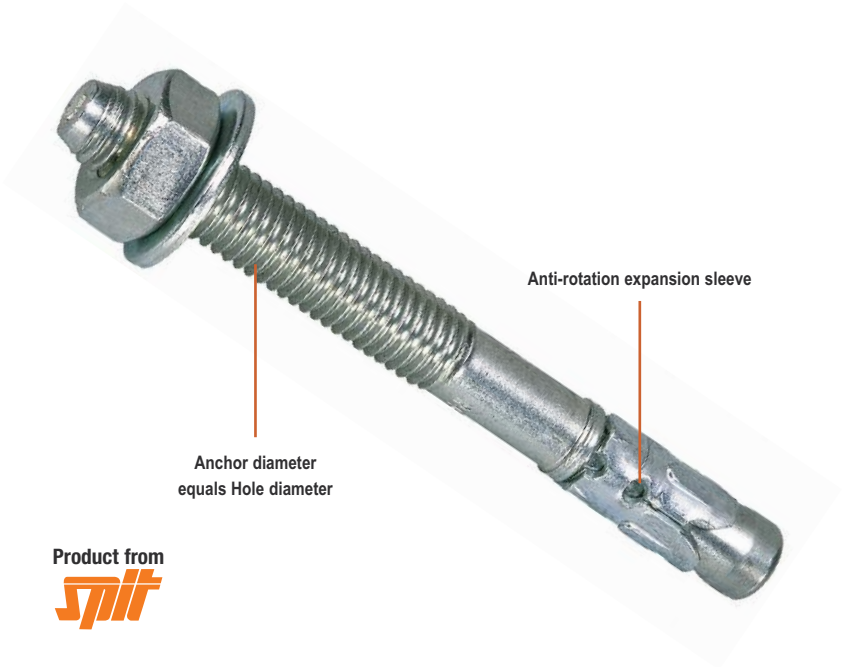
* Safety factor for all loads = 3
* This table does not consider edge distance and anchor spacing effects. Please refer to Ramset Design Guide for more information.
* Pull out test for single anchor = working load x 1.5

Fix 3™ Stud Anchor - Hex Nut - Zinc Plated

Part No	Description	Thread Ø	Max Fixture* Thickness (mm)	Fixture Clearance Hole Ø (mm)	Overall Anchor Length (mm)	Drilled Hole Ø (mm)	Min Hole Depth (mm)	Order Qty
057450	M8x55	M8	5	9	55	8	50	100
057451	M8x70/20-10	M8	20	9	70	8	55	100
057452	M8x90/40-30	M8	40	9	90	8	55	50
057455	M8x130/80-70	M8	80	9	130	8	55	50
057461	M10x75/15-5	M10	15	12	75	10	65	50
057463	M10x95/36-26	M10	36	12	95	10	65	50
057465	M10x125/65-55	M10	65	12	125	10	65	25
057467	M10x160/100-90	M10	100	12	160	10	65	25
057470	M12x80/5	M12	5	14	80	12	80	25
057471	M12x100/25-10	M12	25	14	100	12	80	25
057472	M12x115/40-25	M12	40	14	115	12	80	25
057474	M12x140/65-50	M12	65	14	140	12	80	25
057476	M12x180/105-90	M12	105	14	180	12	80	25
057480	M16x100/5	M16	5	18	100	16	100	20
057481	M16x125/30-15	M16	30	18	125	16	100	20
057482	M16x150/55-40	M16	55	18	150	16	100	10
057483	M16x170/75-60	M16	75	18	170	16	100	10
057484	M16x185/90-75	M16	90	18	185	16	100	10
057490	M20x125/10	M20	10	22	125	20	125	10
057491	M20x165/50-25	M20	50	22	165	20	125	10
057492	M20x220/105-80	M20	105	22	220	20	125	10

* Data based on minimum anchor depth

For hot-dip galvanized stud anchor, please consult Techical Department for anchor proposal.



Product from split

Performance Related	Material Specification
Dynamic Load, Pull down, Fire Resistant	GAL Hot dipped Galvanised

Description

The Fix II™ Stud Anchor is a true-to-size, heavy duty, torque controlled expansion anchor, for permanent anchoring into concrete. Designed for heavy duty anchoring in standard and hard concrete structural applications.

Features and Benefits

- The Fix II™ Stud Anchor diameter equals the required hole diameter providing maximum shear capacity for hole size and making drill bit selection simple. Its cold forged construction ensures superior strength and reliability.
- The anchor design ensures maximum expansion of the sleeve and pull-down on the fixture. These actions are both further assisted by the application of load.
- The anti-rotation expansion sleeve is designed to grip the sides of the hole, preventing anchor rotation during installation.

Substrates

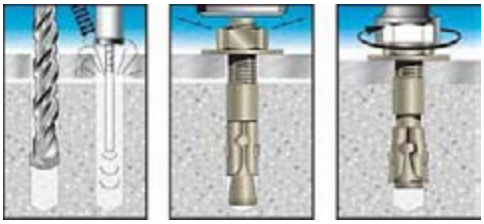
- Concrete

Typical Applications

- Installing curtain walls, balustrades & barriers
- Anchoring elevator guide rails
- Anchoring structural steel columns/beams
- Staduim seating & Pallet racking
- Overhead suspension & Anchoring

Installation

1. Drill a hole to the recommended diameter and depth using the fixture as a template. Clean the hole thoroughly with a hole cleaning brush. Remove the debris with a hand pump, compressed air, or vacuum.
2. Insert the anchor through the fixture and drive with a hammer until the washer contacts the fixture.
3. Tighten the nut with a torque wrench to the specified assembly torque.



Fix II™ Hot Dipped Galvanised Stud Anchor - Recommended Working Loads in 40N/mm² non cracked Concrete

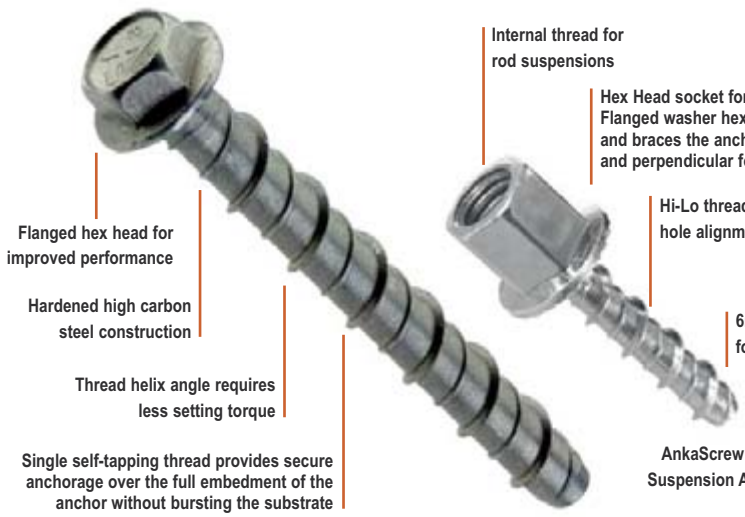
Thread Ø	Embedment Depth (mm)	Tightening Torque (Nm)	Shear Load (kN)*	Tension Load (kN)*
M8	48	15	1.6	3.8
M10	52	30	4.7	5.1
M12	68	50	7.6	8.4
M16	86	100	7.9	16.8

* Safety factor for all loads = 3
* This table does not consider edge distance and anchor spacing effects. Please refer to Ramset Design Guide for more information.
* Pull out test for single anchor = working load x 1.5

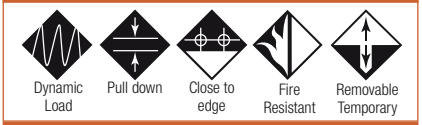
Fix II™ Stud Anchor - Hex Nut - Hot Dipped Galvanised

Part No	Description	Thread Ø	Max Fixture* Thickness (mm)	Fixture Clearance Hole Ø (mm)	Overall Anchor Length (mm)	Drilled Hole Ø (mm)	Min Hole* Depth (mm)	Order Qty
050310	M8x70/20-7	M8	20	10	70	8	52	100
050320	M8x90/40-27	M8	40	10	90	8	52	100
050350	M10x75/15-5	M10	15	12	75	10	62	50
050360	M10x95/36-26	M10	36	12	95	10	62	50
050340	M10x120/60-50	M10	60	12	120	10	62	25
050341	M10x160/100-90	M10	100	12	160	10	62	25
055352	M12x100/25-8	M12	25	14	100	12	75	25
055395	M12x115/40-23	M12	40	14	115	12	75	25
050400	M12x140/65-48	M12	65	14	140	12	75	25
050410	M12x180/105-88	M12	105	14	180	12	75	25
050440	M16x125/30-8	M16	30	18	125	16	95	20
050354	M16x150/55-33	M16	55	18	150	16	95	10
050450	M16x170/75-53	M16	75	18	170	16	95	10

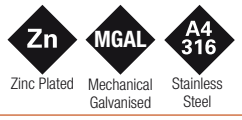
* Data based on minimum anchor depth



Performance Related



Material Specification



Description

The AnkaScrew™ Screw-In Anchor is a totally removable, medium duty, rotation setting, thread forming anchor, ideal for either temporary or permanent anchoring into substrates such as concrete, brick, hollow brick or block. The AnkaScrew™ is particularly well suited to close-to-edge or close-to-anchor fixing as it does not expand and burst the surrounding substrate

Features and Benefits

- New WERCS thread allows fast and easy to install as it simply screws into a pre-drilled hole
- Screw out leaving an empty hole without protruding metal part to grind off
- Does not expand and burst concrete which allows close to edge installation

Substrates

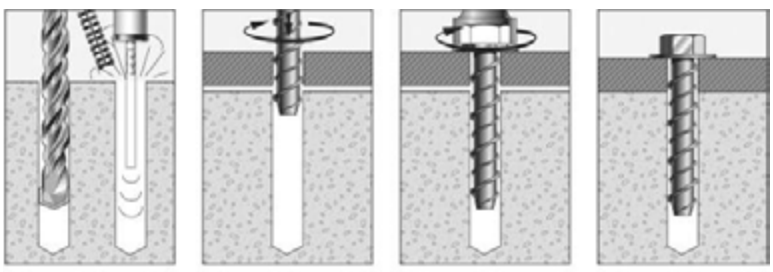
- Concrete
- Solid brick / block
- Hollow brick / block
- Hollow slab

Typical Applications

- Pallet racking
- Temporary safety barriers
- Conveyors
- Pipe brackets
- Gate hinges into brickwork
- Temporary hand rails
- Bottom plates

Installation

1. Drill hole to correct diameter and depth. Clean thoroughly with brush. Remove debris by way of vacuum or hand pump, compress air etc.
2. Using a socket wrench, screw the AnkaScrew™ into the hole using slight pressure until the self tapping action starts.
3. Tighten the AnkaScrew™ until the fixture is held firm. If resistance is experienced when tightening, unscrew the anchor one turn and re-tighten. Ensure that you do not over tighten.
4. For optimum performance, a torque wrench should be used.



AnkaScrew™ Screw-In Anchors - Recommended Working Loads in 40N/mm² non-cracked Concrete

Anchor Size Hole Ø (mm)	Embedment Depth (mm)	Shear Load (kN)*	Tensile Load (kN)*
6	45	3.8	3.8
8	60	7.0	6.1
10	75	11.5	9.1
12	90	13.9	13.3
16	120	30.8	23.1

* Safety factor for all loads = 3
* This table does not consider edge distance and anchor spacing effects. Please refer to Ramset Design Guide for more information.
* Pull out test for single anchor = working load x 1.5

AnkaScrew™ WERCS Thread Screw-In Anchors - Mechanically Galvanised

Part No.	Anchor Diameter (mm)	Anchor Length (mm)	Maximum Fixture Thickness (mm)	Hole Ø (mm)	Hole Depth (mm)	Fixture Hole Diameter (mm)	Order Qty
AS06050WGM	6	50	20	6	60	8	100
AS06075WGM	6	75	45	6	65	8	100
AS06100WGM	6	100	70	6	65	8	100
AS08060WGM	8	60	20	8	75	10	100
AS08075WGM	8	75	35	8	75	10	100
AS08100WGM	8	100	60	8	80	10	100
AS10060WGM	10	60	10	10	80	12	50
AS10075WGM	10	75	25	10	85	12	50
AS10100WGM	10	100	50	10	95	12	50
AS10150WGM	10	150	100	10	95	12	50
AS12075WGM	12	75	15	12	95	15	50
AS12100WGM	12	100	40	12	110	15	50
AS12150WGM	12	150	90	12	110	15	20

* Stainless steel Ankascrew is available upon request. Lead time applies.

AnkaScrew™ Screw-In Anchors - Zinc Plated

Part No.	Anchor Diameter (mm)	Anchor Length (mm)	Maximum Fixture Thickness (mm)	Hole Ø (mm)	Hole Depth (mm)	Fixture Hole Diameter (mm)	Order Qty
AS16115	16	115	40	16	130	19	20
AS16160	16	160	85	16	140	19	20

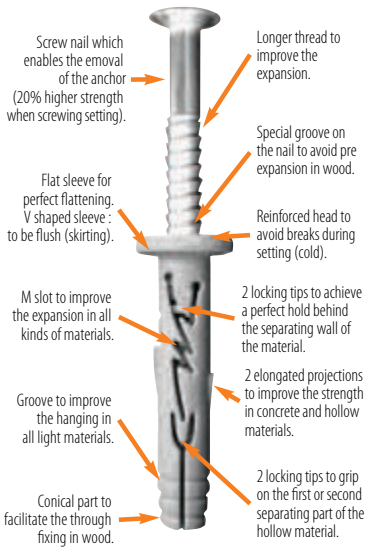
AnkaScrew™ Rod Flanged Head Suspension Anchor - Recommended Working Loads in 40N/mm² non-cracked Concrete

Anchor Size/ Hole Ø (mm)	Embedment Depth (mm)	Min Edge Distance (mm)	Min Anchor Spacing (mm)	Tensile Load (kN)
6	35	25	50	2.3

AnkaScrew™ Rod Flanged Head Suspension Anchor - Zinc Plated

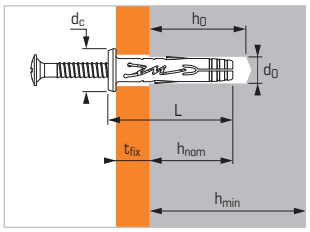
Part No	Description	Internal Thread (mm)	Anchor Size (mm)	Anchor Length (mm)	Drilled Hole Ø (mm)	Min Hole Depth (mm)	Hex Socket Size (mm)	Order Qty
AS06035R10HBZ	AnkaScrew™ Rod Flanged Head - M10	10	6	35	6	45	13	100
AS06035R12HBZ	AnkaScrew™ Rod Flanged Head - M12	12	6	35	6	45	15	50

* Screw-in Anchor to be used for cracked concrete condition is available. Please contact Ramset Technical Department for more information.



Description

Hammer-set anchor for light duty fixings for concrete and all materials types



ETA 014 - 06/0032

INOX STAINLESS STEEL

Technical Data

Part No. Zinc Coated Steel	Part No. Stanless Steel A4	Anchor Size	Embedment Depth (mm) h_{mon}	Max thickness of part to be fix (mm) t_{fix}	Drilling depth through part to be fixed (mm) L+8	Drilling depth in base material (mm) h_o	Drilling Diameter (mm) d_o	Min Thickness of base material (mm) h_{min}	Cylinder Head diameter (mm) d_c	Total Anchor length (mm) L	Type of nail	Order Qty
050116	-	5X25/5 P	20	5	35	30	5	100	9	27	PZ2	200
050117	-	5X25/15 P	20	15	45	30	5	100	9	37	PZ2	200
050118	060104	6X30/5 P	25	5	40	35	6	100	11	32	PZ2	200
050119	-	6X40/12 P	25	12	47	35	6	100	11	39	PZ2	100
050121	060105	6X50/25 P	25	25	60	35	6	100	11	52	PZ2	100
050116	060106	6X65/40 P	25	40	75	35	6	100	11	67	PZ2	100
050129	-	6X40/12 V	25	12	47	35	6	100	10	39	PZ2	100
050131	-	6X50/25 V	25	25	60	35	6	100	10	52	PZ2	100
050132	-	6X65/40 V	25	40	75	35	6	100	10	67	PZ2	100
050142	-	6X30/5 M7X150	30	-	-	40	6	100	11	32	M7	100
060090	060107	8X40/10 P	30	10	50	40	8	100	13	42	PZ2	50
055378	-	8X40/10 P20	30	10	50	40	8	100	13	42	PZ2	100
060091	060108	8X60/30 P	30	30	70	40	8	100	13	62	PZ2	100
060092	060109	8X90/60 P	30	60	100	40	8	100	13	92	PZ2	100
060093	-	8X110/80 P	30	80	120	40	8	100	13	112	PZ2	100
060094	-	8X130/100 P	30	100	140	40	8	100	13	132	PZ2	100
060095	-	8X60/30 V	30	30	70	40	8	100	11.5	62	PZ2	100
060096	-	8X90/60 V	30	60	100	40	8	100	11.5	92	PZ2	100
060097	-	8X110/80 V	30	80	120	40	8	100	11.5	112	PZ2	50
060098	-	8X130/100 V	30	100	140	40	8	100	11.5	132	PZ2	50
057601	-	8X160/125 P	30	125	206	40	8	100	15	198	PZ3	50
057602	-	8X180/145 P	30	145	166	40	8	100	15	158	PZ3	50
057603	-	8X200/165 P	30	165	206	40	8	100	15	198	PZ3	50

* In masonry, the thickness of the part to be fixed may fluctuate, to ± 5 mm for Ø5 and Ø6 mm and to ± 10 mm for Ø8 mm, to allow a good contact between collar and the part to be fixed.

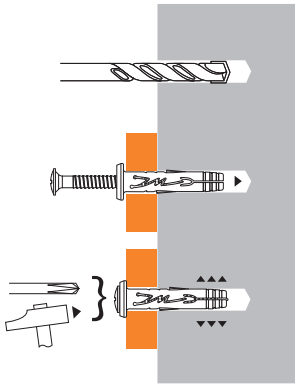
Applications

- Insulation cladding
- Profiles for thin coat external
- Insulation systems
- Drywall track
- Wood
- Flashing
- Electrical accessories
- Collar

Material

- Body: polyamid 6
- Expansion nail: Zinc coated steel: FR 15 (5 µm) Stainless steel: A2
- Screw head type: PZ2/PZ3

Installation



WARNING:
For anchor sizes 8X160/125P, 8X180/145P & 8X200/165P, setting only by screwing

Characteristics Load (N_{RK} V_{RK}) in kN

TENSILE

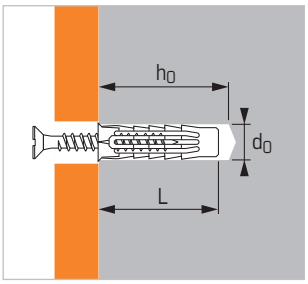
Base material \ Anchor size	Ø5	Ø6	Ø8
Concrete (C20/25)			
N_{Rk}	0,60	0,90	1,2
Solid concrete blocks B120 (fc = 13,5 N/mm²)			
N_{Rk}	0,30	0,40	0,50
Clay bricks (fc = 55 N/mm²)			
N_{Rk}	0,20	0,80	1,2
Hollow concrete blocks B40 not rendered (fc = 6,5 N/mm²)			
N_{Rk}	0,20	0,30	1,2
Hollow concrete blocks B40 rendered (fc = 6,5 N/mm²)			
N_{Rk}	0,95	1,70	2,25
Hollow clay bricks Eco-30 not rendered (fc = 4,5 N/mm²)			
N_{Rk}	0,30	0,40	0,50
Hollow clay bricks Eco-30 rendered (fc = 4,5 N/mm²)			
N_{Rk}	0,95	1,30	1,70
Engineering clay bricks not rendered (fc = 14,5 N/mm²)			
N_{Rk}	0,55	0,75	0,95
Engineering clay bricks rendered (fc = 14,5 N/mm²)			
N_{Rk}	0,95	1,30	1,70
Aerated concrete (Mvn = 500 kg/m³)			
N_{Rk}	0,15	0,2	0,3
Plasterboard BA13			
N_{Rk}	0,15	0,15	0,18
Plasterboard BA10 + polystyren			
N_{Rk}	0,18	0,18	0,2

SHEAR

	5X25/5 5X35/15	6X30/5 6X40/12 6X50/25	6X65/40	8X40/10 to 8X90/60	8X110/80 to 8X200/165
V_{Rk}	1,9	2,8	2,25	4,3	3,55
V_{Rk}	1,9	2,8	2,25	4,3	3,55
V_{Rk}	1,9	2,8	2,25	4,3	3,55
V_{Rk}	1,9	2,25	2,25	2,8	2,8
V_{Rk}	1,9	2,25	2,25	2,8	2,8
V_{Rk}	0,55	0,75	0,75	0,9	0,9
V_{Rk}	0,9	1,1	1,3	1,7	1,7
V_{Rk}	1,9	2,25	2,25	2,8	2,8
V_{Rk}	1,9	2,8	2,25	4,3	3,55
V_{Rk}	0,15	0,2	0,2	0,3	0,3
V_{Rk}	0,15	0,15	0,15	0,18	0,18
V_{Rk}	0,18	0,18	0,18	0,2	0,2

Description

Nylon anchor for hollow and solid material



Applications

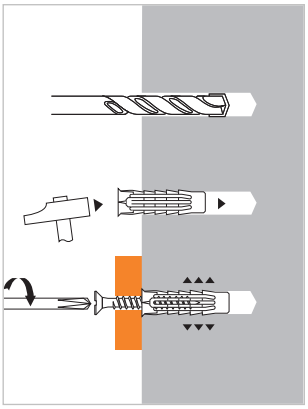
- Lightweight fixing in all base material
- Small electrical accessories, small light fittings, fuse boxes, etc...

Material

- Body: polyamid 6

  Suitable temperature - 20° + 40°C
- Screw : Special screw supplied, head type PZ2

Installation



Technical Data

Part No. without screw	Part No. with VBA screw	Anchor Size (mm)	Screw diameter (mm)	Drilling depth (mm) h_o	Drilling diameter (mm) d_o	Total anchor length (mm) L	Order Qty (mm)
565642	565646	5X25	3-4	35	5	25	100
565643	565647	6X30	4-5	40	6	30	100
565644	565648	8X40	4.5-6	50	8	40	100
565645	565649	10X50	6-8	65	10	50	50
565617	-	12X60	8-10	75	12	60	25
565618	-	14X70	10-12	85	14	70	20

Recommended Load (N_{rec}) and Ultimate Load ($N_{Ru,m}$) in kN with wood screw

TENSILE

Base material \ Anchor size / Screw Ø	Ø5 4	Ø6 5	Ø8 6	Ø10 8
Concrete (≥C20/25)				
N_{rec}*	0,28	0,28	0,50	0,70
$N_{Ru,m}$*	1,40	1,40	2,50	3,50
Hollow concrete blocks B 40				
N_{rec}*	0,23	0,3	0,43	0,46
$N_{Ru,m}$*	1,15	1,5	2,15	2,30
Clay bricks BP 400				
N_{rec}*	0,20	0,26	0,35	0,60
$N_{Ru,m}$*	1,00	1,30	1,75	3,00
Hollow clay bricks Eco 40				
N_{rec}*	0,17	0,19	0,23	0,25
$N_{Ru,m}$*	0,85	0,95	1,15	1,25

* Indicative values : depending on the type of screw used, the loads must be reduce by 50 %

Material Specification

Zn	GAL	A4 SS
Zinc Plated	Hot dipped Galvanised	Stainless Steel

Description

Cast-In Anchor to suit various bolt type
The TCM is a medium to heavy duty, cast-in ferrule. All steel threaded socket for casting into pre-cast concrete and institute concrete elements, giving a prefixed fastening point.

Product Advantages

- Stress free anchoring close to edge and reduced anchor spacing
- Cast-in placement eliminates the need for drilling, this is particularly important where reinforcing is present in the fixing zone
- Ideal for shallow embedment as the anchor can be tied into the reinforcing to distribute the load over a wider area to become an intergral part of the reinforcing structure
- High tensile load carrying capacities as well as applications in tension zones
- Also available in A4 316 material for industrial environment

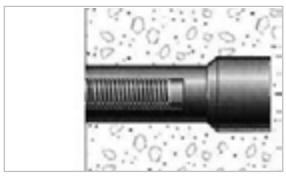
Typical Applications

- Structural connections
- Curtain wall and facade fixings (concrete, GRC etc)
- Anchoring bracing and precast panels

Substrates

- Concrete
- GRC

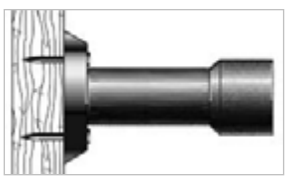
Installation

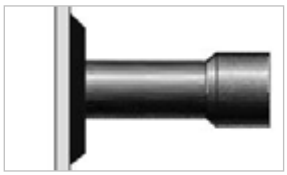


Concrete inserts can be set in wet concrete, attached into reinforcing through the cross hole (for reinforced case) or fastened to the inside of formwork with a bolt through the formwork.

1. Drill hole in formwork. Pass the bolt through the hole into the concrete insert and tighten. Tie the insert to the reinforcing system.

2. Pour the concrete. Remove the bolt and formwork leaving the concrete insert firmly embedded.





Options to use with nail plate and glue-on plate:

1. Nail plate

2. Glue-on plate (for steel formwork)

TCM™ Cast-in Anchors (Stainless Steel) - Recommended Working Loads in 40N/mm² non-cracked Concrete

Thread Ø	Embedment Depth (mm)	Torque (Nm)	Unreinforced ferrule Shear Load (kN)	Unreinforced ferrule Tensile Load (kN)	Reinforced ferrule Shear Load (kN)	Reinforced ferrule Tensile Load (kN)
M8	28	10	5.2	4.9	-	-
M10	29	17	8.3	5.3	8.3	6.3
M12	37	30	12.2	7.8	12.2	9.3
M16	52	75	23.4	14.4	23.4	17.2
M20	57	144	31.7	16.1	31.7	19.3
M24	101	250	42.7	35.5	42.7	43.1

* Safety factor for all loads = 3
* This table does not consider edge distance and anchor spacing effects. Please refer to Ramset Design Guide for more information.
* Pull out test for single anchor = working load x 1.5
* Reinforcing TCM is TCM connected to reinforcing bar of specified length.

TCM™ Cast-in Anchors (Zn Plated / Hot Dipped Galv) - Recommended Working Loads in 40N/mm² non-cracked Concrete

Thread Ø	Embedment Depth (mm)	Torque (Nm)	Unreinforced ferrule Shear Load (kN)	Unreinforced ferrule Tensile Load (kN)	Reinforced ferrule Shear Load (kN)	Reinforced ferrule Tensile Load (kN)
M8	28	10	5.2	4.9	-	-
M10	29	17	8.3	5.3	8.3	6.3
M12	37	30	12.2	7.8	12.2	9.3
M16	52	75	23.4	14.4	23.4	17.2
M20	57	144	29.3	16.1	29.3	19.3
M24	101	250	36.7	35.5	36.7	43.1

* Safety factor for all loads = 3
* This table does not consider edge distance and anchor spacing effects. Please refer to Ramset Design Guide for more information.
* Pull out test for single anchor = working load x 1.5
* Reinforcing TCM is TCM connected to reinforcing bar of specified length.

TCM™ Cast-in Anchors

Part No. Zn Plated	Part No. Galv	Part No. SS	Thread Ø (mm)	Overall Anchor Length (mm)	Thread Length (mm)	Cross Hole to suit (Reinforced ferrule) (mm)	Order Qty
TCM8R	TCM8GH	TCM8RSS	M8	35	16	R8x300	50
TCM10R	TCM10GH	TCM10RSS	M10	44	20	R8x300	50
TCM12R	TCM12GH	TCM12RSS	M12	54	25	R8x300	50
TCM16R	TCM16GH	TCM16RSS	M16	75	32	Y12x300	50
TCM20R	TCM20GH	TCM20RSS	M20	80	38	Y12x300	25
TCM24R	TCM24GH	TCM24RSS	M24	125	50	Y12x300	25

Metric Plastic Nail Plates

Part No.	Description	Qty (per box)
NP12	Nail Plate to suit M12 Cast-in Anchor	100
NP16	Nail Plate to suit M16 Cast-in Anchor	100
NP20	Nail Plate to suit M20 Cast-in Anchor	100
NP24	Nail Plate to suit M24 Cast-in Anchor	100

Glue-on Metric Plate

Part No.	Description	Qty (per box)
NP12GLUE	Glue-on Plate 12mm Red	100
NP16GLUE	Glue-on Plate 16mm Green	100
NP20GLUE	Glue-on Plate 20mm Blue	100
NP24GLUE	Glue-on Plate 24mm Yellow	100
GPTAB	Double-sided Adhesive Tab	100

Note: All glue-on plates do not come with Adhesive Tab in the box.

Description

Cast-In Anchor to suit various bolt type
The CIM is a medium to heavy duty, cast-in ferrule. All steel threaded socket for casting into pre-cast concrete and institute concrete elements, giving a prefixed fastening point.

Product Advantages

- Stress free anchoring close to edge and reduced anchor spacing
- Cast-in placement eliminates the need for drilling, this is particularly important where reinforcing is present in the fixing zone
- Ideal for shallow embedment as the anchor can be tied into the reinforcing to distribute the load over a wider area to become an intergral part of the reinforcing structure
- High tensile load carrying capacities as well as applications in tension zones
- Simple cost effective design with material or finishing ranging from ZP, HDG, A2 and A4

Material Specification

Zn	A2 304	A4 316
Zinc Plated	Stainless Steel	Stainless Steel

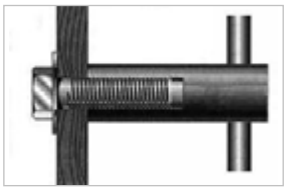
Substrates

- Concrete
- GRC

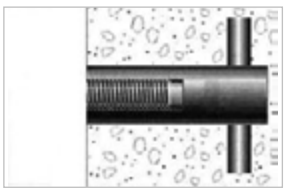
Applications

- Structural connections
- Curtain wall and facade fixings (concrete, GRC etc)
- Panel to panel connection
- High shear load applications
- Cooking bench
- Temporary precast panel braching points

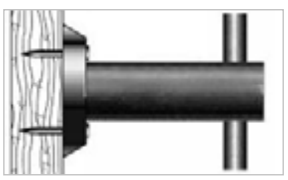
Installation



1. Drill hole in formwork. Pass the bolt through the hole into the concrete insert and tighten. Tie the pin of the insert to the reinforcing system.

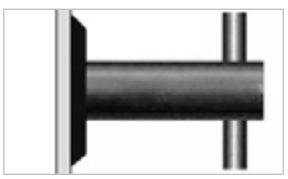


2. Pour the concrete. Remove the bolt and formwork leaving the concrete insert firmly embedded.



Options to use with nail plate and glue-on plate:

1. Nail plate



2. Glue-on plate (for steel formwork)

CIM Cast-in Anchors (Stainless Steel A2/A4) - Recommended Working Loads in 40N/mm² non-cracked Concrete

Thread Ø	Embedment Depth (mm)	Torque (Nm)	Unreinforced ferrule Shear Load (kN)	Unreinforced ferrule Tensile Load (kN)	Reinforced ferrule Shear Load (kN)	Reinforced ferrule Tensile Load (kN)
M6	26	5	2.8	3.2	2.8	3.9
M8	26	10	5.2	4.9	5.2	5.9
M10	35	17	8.3	5.0	8.3	6.3
M12	46	30	12.0	7.3	12.0	9.1
M16	57	75	22.1	12.3	22.1	15.3
M20	67	144	26.0	13.9	26.0	17.4
M24	112	250	33.7	32.5	33.7	40.7

* Safety factor for all loads = 3
* Shear load is calculated using Grade 8.8 steel or A4-80 stainless steel bolt
* This table does not consider edge distance and anchor spacing effects. Please refer to Ramset Design Guide for more information.
* Pull out test for single anchor = working load x 1.5
* Reinforcing CIM is CIM connected to reinforcing bar of specified length.

CIM Cast-in Anchors (Zn Plated) - Recommended Working Loads in 40N/mm² non-cracked Concrete

Thread Ø	Embedment Depth (mm)	Torque (Nm)	Unreinforced ferrule Shear Load (kN)	Unreinforced ferrule Tensile Load (kN)	Reinforced ferrule Shear Load (kN)	Reinforced ferrule Tensile Load (kN)
M6	26	5	2.8	3.2	2.8	3.9
M8	26	10	5.1	4.9	5.1	5.9
M10	35	17	8.3	5.0	8.3	6.3
M12	46	30	11.6	7.3	11.6	9.1
M16	57	75	20.9	12.3	20.9	15.3
M20	67	144	23.3	13.9	23.3	17.4
M24	112	250	29.0	32.5	29.0	40.7

* Safety factor for all loads = 3
* Shear load is calculated using Grade 8.8 steel or A4-80 stainless steel bolt
* This table does not consider edge distance and anchor spacing effects. Please refer to Ramset Design Guide for more information.
* Pull out test for single anchor = working load x 1.5
* Reinforcing CIM is CIM connected to reinforcing bar of specified length.

CIM Cast-in Anchors

Part No. Zn Plated	Part No. SS304	Part No. SS316	Thread Ø (mm)	Overall Anchor Length (mm)	Thread Length (mm)	Fixture Hole Ø (mm)	Order Qty
CIM06	CIM06SS	CIM06SS316	M6	35	14	7	50
CIM08	CIM08SS	CIM08SS316	M8	35	16	9	50
CIM10	CIM10SS	CIM10SS316	M10	44	22	12	50
CIM12	CIM12SS	CIM12SS316	M12	55	25	14	50
CIM16	CIM16SS	CIM16SS316	M16	70	32	18	50
CIM20	CIM20SS	CIM20SS316	M20	80	38	22	25
CIM24	CIM24SS	CIM24SS316	M24	125	50	27	25

Metric Plastic Nail Plates

Part No.	Description	Qty (per box)
NP12	Nail Plate to suit M12 Cast-in Anchor	100
NP16	Nail Plate to suit M16 Cast-in Anchor	100
NP20	Nail Plate to suit M20 Cast-in Anchor	100
NP24	Nail Plate to suit M24 Cast-in Anchor	100

Glue-on Metric Plate

Part No.	Description	Qty (per box)
NP12GLUE	Glue-on Plate 12mm Red	100
NP16GLUE	Glue-on Plate 16mm Green	100
NP20GLUE	Glue-on Plate 20mm Blue	100
NP24GLUE	Glue-on Plate 24mm Yellow	100
GPTAB	Double-sided Adhesive Tab	100

Note: All glue-on plates do not come with Adhesive Tab in the box.

Versatile Packing Shims

Description

Modfix Shimplate
Designed for packing underneath concrete precast or tilt-up panel, to gain alignment with a non-skid surface.

Colour coded by thickness for ease of selection. Modfix packing shims are manufactured from quality plastic and tested with compressive loads up to 20 tonnes.

Horseshoe style with long and short slots, are also available for placement around starter bars, locating bolts and pins etc.

Ideal for
Commercial and civil applications such as packing under panels, machines, door and window frames.

Size availability
Standard size 150 x 100 with 1, 2, 3, 5, 10,15 and 20mm thickness.

Horseshoe and half shims are also available

Feature and Benefits

- Very light to carry that ease the job at height
- No contact corrosion with steel or stainless steel bracket/anchor
- Variety of size and thickness

Material and Properties

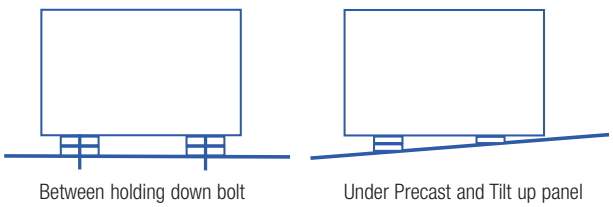
A reinforced polypropylene blend compound, exhibiting excellent surface finish and processability characteristics.

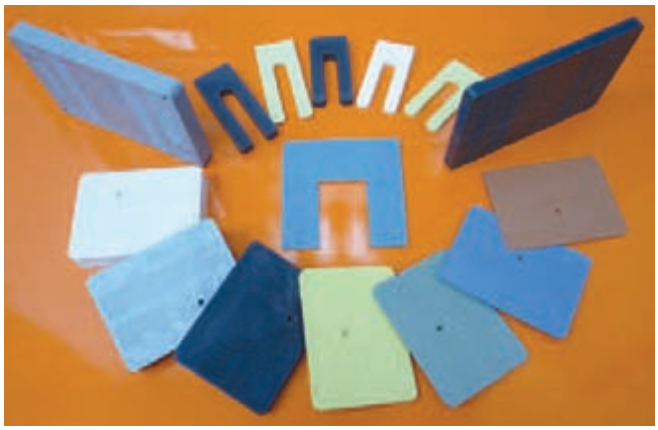
Property	Test Method	Units	Value[2][3]
Tensile @ Yield	ASTMD638	MPa	28
Elongation @ Break	ASTMD638	%	50
Flexural Strength	ASTMD790	MPa	42
Flexural Modulus	ASTMD790	GPa	2.4

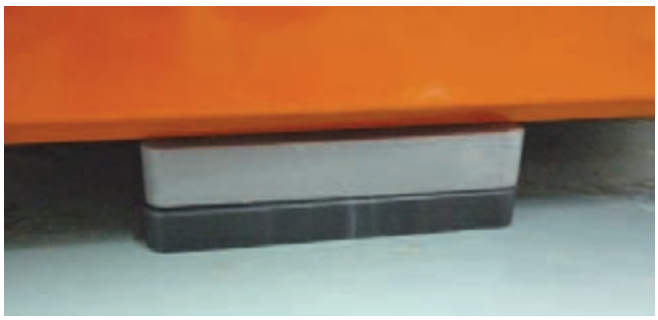
(1) Typical properties; not to be construed as specifications.
(2) Values quoted are the result of tests on representative samples and the product supplied may not conform in all respects.
(3) Values quoted are the result of tests on Natural/Un-pigmented product. These values may vary on products that contain pigmentation or any other additive.

Typical Application

- Bottom of precast panel
- Shim between streel bracket and wall

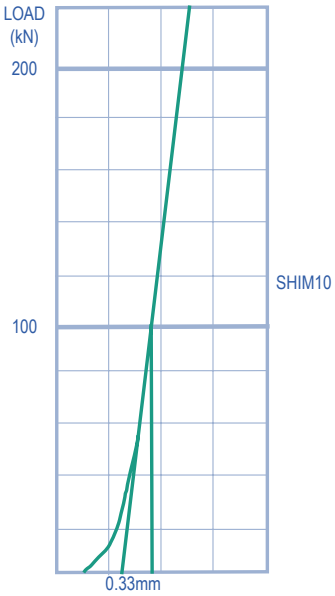






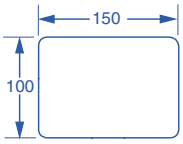
Load Performance

Compression tests on Modfix standard panel shims have been carried out at Monash University, Department of Material Engineering. No Yielding nor any deformation was observed.



Dimension

Full Shim 150mm x 100mm

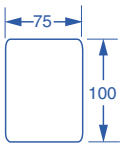


FULL SHIM

FULL

Thickness	Colour	Pack Qty.	Part No.
1	BROWN	100	SHIM01
2	BLUE	200	SHIM02
3	GREEN	100	SHIM03
5	YELLOW	100	SHIM05
10	BLACK	40	SHIM10
15	GREY	40	SHIM15
20	WHITE	30	SHIM20

Half Shim 100mm x 75 mm

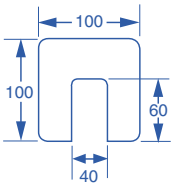


HALF SHIM

HALF

Thickness	Colour	Pack Qty.	Part No.
1	BROWN	200	SHS01
2	BLUE	400	SHS02
3	GREEN	200	SHS03
5	YELLOW	200	SHS05
10	BLACK	80	SHS10
15	GREY	80	SHS15
20	WHITE	60	SHS20

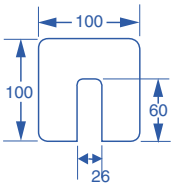
Horseshoe Shim 100mm x 100 mm with slot 60mm x 40mm



TYPE 'C'

Thickness	Colour	Pack Qty.	Part No.
2	BLUE	200	SHHC02-100/40
3	GREEN	200	SHHC03-100/40
5	YELLOW	200	SHHC05-100/40
10	BLACK	100	SHHC10-100/40

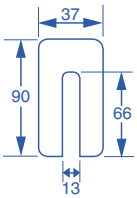
Horseshoe Shim 100mm x 100 mm with slot 60mm x 26mm



TYPE 'C'

Thickness	Colour	Pack Qty.	Part No.
1	BROWN	200	SHHC01-100/26
5	YELLOW	200	SHHC05-100/26

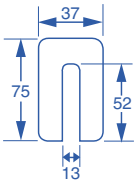
Horseshoe Shim 90mm x 37 mm with slot 66mm x 13mm



TYPE 'B'

Thickness	Colour	Pack Qty.	Part No.
1.5	BROWN	1000	SHHB01.5-90
3	GREEN	1000	SHHB03-90
5	YELLOW	1000	SHHB05-90
10	BLACK	500	SHHB10-90

Horseshoe Shim 75mm x 37 mm with slot 52mm x 13mm



TYPE 'A'

Thickness	Colour	Pack Qty.	Part No.
1.5	BROWN	1000	SHHA01.5-75
3	GREEN	1000	SHHA03-75
5	YELLOW	1000	SHHA05-75
6.5	WHITE	500	SHHA06.5-75
10	BLACK	500	SHHA10-75

Safety Comes first

Material Specification

HDG | A4 316

Description

Safety Ring Anchor System

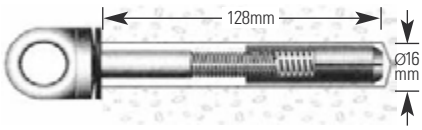
Conforming to the Requirement of BS EN 795:2012 Standard

Specifically design for use on buildings where windows cleaners and others that employ industrial rope access.

The Safety Ring Anchor System provides a secure, permanent anchorage point for fall arresting safety harnesses.

The system meets the static and dynamic strength tests per BS EN 795:2012, as highlighted by OSHA.

Safety Ring Anchor System (EN795)



Part No.	Material	Thread Ø	Internal Ring Diameter (mm)	Overall Length (mm)	Min Concrete Thickness (mm)	Anchor Hole Diameter (mm)	Hole Depth (mm)	For use only with	Setting Tool	Order Qty
RSR12GM	Hot Dipped Galv.	M12	16	138	180	16	128	DSM12SS	SETSA4	4
RSR12SS	AISI 316(A4)	M12	16	138	180	16	128	DSM12SS	SETSA4	4

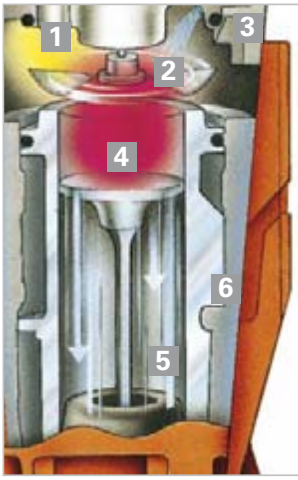
NOTE: When installed in accordance with Ramset™ specifications, anchor performance is fully compliant with AS/NZS1891.4:2000 "Industrial fall-arrest systems and devices".
BS EN795 (Static Tension - 12kN, Drop test - 100kg/2.5m)
BS5845 (Static Tension - 10kN, Drop test - 136kg/1m)
AS2626 (Static Tension - 15kN)
NZS5802 (Static Tension - 27kN, Static shear - 5kN, Drop test - 110kg/1.2m)

* Refer to Ramset™ Design Guide for more information or explanation of technical data

Non-destructive pull-out test of 6kN and sustain for a minimum of 15 seconds is required for each Safety Ring Anchor after installation to ensure the compliance of BS EN 795 Standard.


Ramset
TrakFast 800

Gas Technology - How it works



1. Spark Plug
2. Fan Motor
3. Fuel Port
4. Combustion Chamber
5. Piston Assembly
6. Cylinder

With its own internal combustion engine, Ramset™ Gas Technology fastens cable management, wiring accessories and partitioning track much faster than any other system!

At the heart of Ramset™ Gas Technology is the patented linear combustion engine. With its steel piston rings and precision-machined combustion chamber, Ramset™ Gas Technology drives fasteners 6 times faster then traditional explosive power actuated tool system.

When used with PULSA fuel cells and Ramset approved fasteners, European Safety Standard EN 792-13 can be met to ensure operators safety.

How to select a Ramset™ Gas Technology Fixing to directly fasten an object for permanent installation

Fixing to concrete

As the fixing enters the concrete, extreme pressure and heat are created. This creates a bond that provides high loading strength in concrete.

Edge distance

Do not fix closer than 60mm from the edge of concrete. If the concrete cracks, the fixing may not hold.

Recommended minimum fixing spacing

Setting fixings too close together can cause the concrete to crack. The recommended minimum distance between fixings is 40mm. Never attempt a fixing application too close to another fixing as this could affect the previously inserted fixing's embedment.

Concrete thickness

It is important that the concrete be at least three times as thick as the fixing penetration. If the concrete is too thin, the compressive forces forming at the fixing's point can cause the free face of the concrete to break away.
This creates a dangerous condition from flying concrete and / or the fixing and also results in a reduction of fastener holding power.

Fixing to steel

The resilience of steel provides a clamping effect to the fixing. This combined with the tremendous heat that is created, provides a welding and clamping effect to give maximum holding power.

Edge distance

The recommended edge distance for a fixing to the edge of steel is 10mm. Never fire the tool within 10mm of the edge of a steel base material because the steel may bend or break off, allowing the fixing to ricochet.

Recommended minimum fastener spacing

The recommended minimum distance between fixings is 20mm. Never attempt a fixing application too close to another fixing as this could affect the previously installed fixing's embedment.

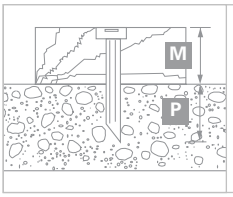
Steel thickness.

Do not fasten into steel base material thinner than the fastener shank diameter. Holding power may be reduced and the fastener may be overdriven.

As a guide when:

- Fixing into steel - min. steel thickness = 3mm

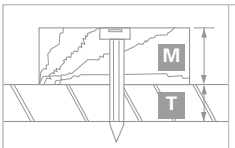
Minimum Shank Length



Minimum Shank Length

Thickness of material (M)	+	Required penetration (P)

Minimum Shank Length



Minimum Shank Length

Thickness of material (M)	+	Thickness of steel (T)	+	5mm point allowance

Adjusting Fastener Penetration – TrakMaster™ & Trakfast™ 800 Only

All Ramset™ Gas Technology tools automatically adjust their power to suit the supporting material. These gas technology tools can adjust their power up to a maximum impact energy that is determined by the capability of each tool model. (This is one of the main differences between Ramset™ Gas Technology tools and Powder Actuated tools).

Even though Ramset™ Gas Technology tools automatically adjust their power, certain applications may require the fastener to penetrate deeper into the base material or penetrate less.

Ramset™ TrakMaster™ and Trakfast™ 800 tools are designed with a feature that allows adjustment of the fastener penetration to be performed. This adjustment is dependent both on the type and hardness of the base material and on the object being fixed. The adjustment does not affect the impact energy that is supplied to the fastener.

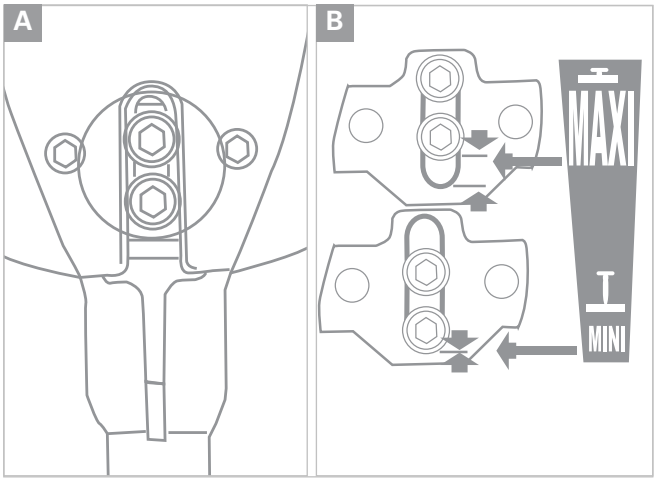
To ensure successful fixing of cable clips (EClip™ etc.) it is recommended that the gas tool is set to the minimum drive position. Failure to do so could result in cracking or breaking of accessories and PVC trunking.

Penetration is adjusted by slackening the two screws (A) on the upper part of the barrel using the allen key provided and moving them backwards or forwards (4mm) in the recess on plate (B).

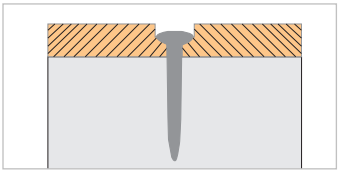
The adjustment range is 4mm. Intermediate adjustments between maximum and minimum are possible.

For best fixing results, check the adjustment position before and during work.

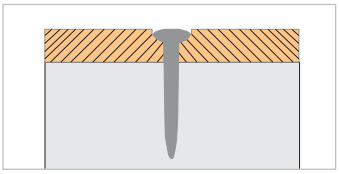
Adjusting Penetration



Maximum Penetration



Minimum Penetration

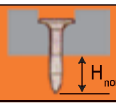
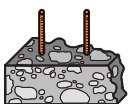


Pulsa™ Technology - TrakMaster™ & Trakfast™ 800 Only

As gases are affected by temperature, to generate exactly the same power in a gas technology tool the fuel injector must vary the amount of gas delivered to the combustion chamber.

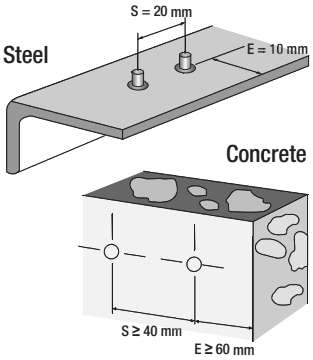
The TrakMaster™ and Trakfast™ 800 tools use PULSA™ technology which employs temperature dependent Electronic Fuel Injection (E.F.I.) to accurately inject the exact amount of gas that the tool requires no matter what the ambient temperature is. The tool actually detects what the ambient temperature is and calculates the amount of gas to release from the fuel cell. This 'smart' technology ensures that the tool delivers the right amount of power…. every time!

Characteristic and Recommended Load

Substrate		Characteristic Resistance		Recommended Load*	
		N^{rk} (kN)	V^{rk} (kN)	N_{rec} (kN)	V_{rec} (kN)
 C20/25 to C60/70 suitable for pre-stressed concrete	H_{nom} = 10 mm	0.34	0.75	0.10	0.25
	H_{nom} = 15 mm	0.87		0.30	
	H_{nom} = 18 mm	1.19		0.40	
	H_{nom} = 20 mm	1.41		0.47	
 Steel = 410 - 450 N/mm² Steel = 500 - 550 N/mm²	H_{nom} = 6.5 mm	5.0	3.6	1.5	1.2

* Loading data is for reference only and it is recommended to make a field test to verify the actual situation. Please contact the sales or technical department for more information.

Recommended Spacing and Edge Distance



S = the minimum spacing between two fixings
E = the minimum distance from the edge

Trakfast™ 800 for Ceiling, Partitioning and General Contractors

New

Product from Spit

Features and Benefits

The TRAKFAST™ 800 offers excellent dust protection, ventilation and cooling: three essential ingredients for better tool efficiency and lifetime. The tool has a dust protected magazine, which together with the air filter offers integrated protection from dust and debris. Dust shield help cool the tool, ideal for periods of intensive use. All these features will result in less tool maintenance, keeping you working longer. Works six times faster than traditional plug screw fixings.

- Massive 100J power – Consistent fixings even in extremeapplications.
- 20 pin magazine allowing the tool to fit in tight spaces.
- Optional 50 pin magazine – Reduces downtime in loading the magazine.
- Battery Gauge – Helps avoid running out of battery power.
- Fuel Cell Gauge – Always know when to change fuel cells.
- Lithium Battery – Fast Charge, Long Life
- Tool-less Depth of Drive Adjustment
- Power Saving Technology – isolates battery when tool is not in use
- Easily removable fastener guide and magazine
- Greater tool clearance – Allows the tool to fit in close to edge applications.
- Greater track clearance – Allows the tool to fit in deep track, up to 57mm.
- Removable Support Leg – Ensures tool is at 90° to work surface for optimum fixings
- Electronically controlled fuel injection – Ensures consistent power in a wide temperature range.
- Low Maintenance. Designed to work in all conditions.

Substrates

Concrete, Composite Steel Decking, Solid Brick, Precast Concrete, Steel Pre-stressed Concrete, Hollow Block Wall, Reinforced Concrete, Reinforced Prefabricated Concrete

Description

TrakFast™ 800 is the most technologically advanced gas tool on the market. The new TrakFast™ 800 offers a number of innovative features allowing quicker, safer installation of partitioning track, pest control mesh and formwork systems. With the 50 pin magazine and extra power, the speed at which the TrakFast™ 800 is able to perform installations provides tremendous savings in total installed cost.

Tool Specifications

Weight	3.8kg (a) / 3.9kg (b)
Height	309mm (a) / 520mm (b)
Length	396mm
Magazine Capacity	20 (+3) pin magazine 50 (+3) pin magazine
Impact Force	100J
Actuation Pressure	5kg
Intermittent Operation	2 pins per second
Fuel Cell Life	600 pins (approx)
Battery Charge Capacity	3,000 pins (approx)
Battery Voltage	3.7V Lithium-Ion
Battery Charge time	90mins (25mins for 500 fixings)
Power Regulation	Automatic
Operating Temperature Range	-5°C to 49°C

Trakfast 800 Pulsa Gas Tool with 50 Pin Magazine

Applications

Product Range - TRAKFAST™ 800

Part No.	Description	Order Qty
TRAKFAST800	Trakfast 800 PULSA Gas Tool (with 20 Pin Magazine)	1

Kit includes: Trakfast™ 800 Tool, high impact carry case, 2 batteries, a battery charger, a safety glasses, allen key, dust cover and instruction manual

C6 Pins - Standard Concrete Substrates

Raw Material	Carbon Steel
Corrosion Protection	Zinc Electroplated (Minimum coating 5µm)
Nominal Head Diameter	6.3mm
Nominal Shank Diameter	2.6mm
Shear Strength	1120N/mm²
Tensile Strength	1800N/mm²
Hardness	52-56HR_C for P8C620; 50-55HR_C for others

Part No	Description	Length	Collection	Order Qty
060520	P8C620 Gas Pin	20mm	Black	500
060521	P8C625 Gas Pin	25mm	Black	500
060522	P8C630 Gas Pin	30mm	Black	500
060523	P8C635 Gas Pin	35mm	Black	500
057544	P8C640 Gas Pin	40mm	Black	500

10 strip collation (suitable for use in 20 and 50 pin magazines) + 1 x Pulsa 800 Fuel Cell

Trakfast™ 800 for Ceiling, Partitioning and General Contractors

HC6 Pins - Hard Concrete and Steel Substrates

Raw Material	Carbon Steel
Corrosion Protection	Zinc Mechanically Plated (Min coating 10µm)
Nominal Head Diameter	6.4mm
Nominal Shank Diameter	3.0mm (Stepped shank 3.0/ 2.6mm)
Shear Strength	1200N/mm²
Tensile Strength	1950N/mm²
Hardness	53-56HR_C for P8HC615; ≥56HR_C for P8HC617, 22, 27, 32

Part No	Description	Length	Collection	Order Qty
060524	P8HC615 High Strength Gas Pin	15mm	Orange	500
060525	P8HC617 High Strength Gas Pin	17mm	Orange	500
060526	P8HC622 High Strength Gas Pin	22mm	Orange	500
057553	P8HC627 High Strength Gas Pin	27mm	Orange	500
057554	P8HC632 High Strength Gas Pin	32mm	Orange	500

10 strip collation (suitable for use in 20 and 50 pin magazines) + 1 x Pulsa 800 Fuel Cell

Stainless Steel Pins for Special Applications

Raw Material	Stainless Steel Grade 304
Nominal Head Diameter	6.4mm
Nominal Shank Diameter	3.0mm (Stepped shank 3.0/ 2.6mm)
Pull-out Strength Exceeds	1kN (in concrete)

Part No	Description	Length	Collection	Order Qty
SS619TF800	Stainless Steel Pins SS619(TF800)	19mm	Black	500

10 strip collation (suitable for use in 20 and 50 pin magazines) + 1 x Pulsa 800 Fuel Cell

Product Range - Accessories


018543


018544


011773


014641

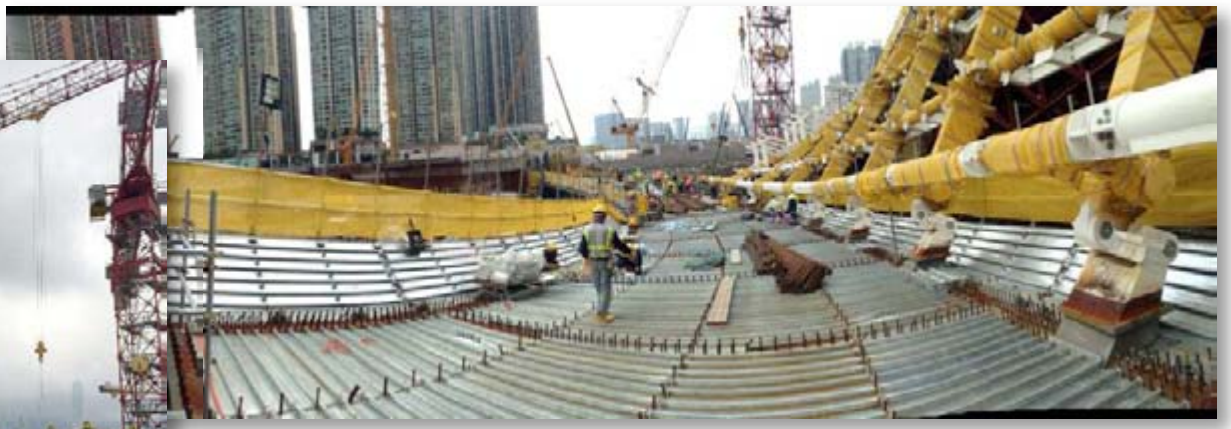

014642

018545

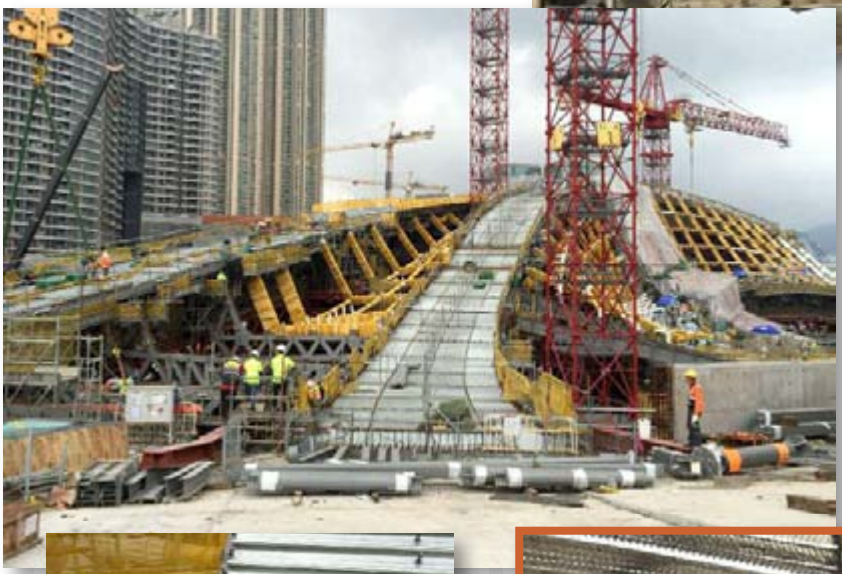

018546

900507

Part No	Description	Order Qty
018544	50 Pin Magazine for TrakFast™ 800	1
018543	20 Pin Magazine for TrakFast™ 800	1
014641	Magnetic Washer Holder for TrakFast™ 800	1
014642	Flat Magnetic Angle/Z-clip Holder for TrakFast™ 800	1
018424	TrakFast™ 800 Fastener Guide	1
018423	CableMaster™ 800 Fastener Guide	1
013061	Cleaning Kit - Gas Tool	1
018545	Battery Lithium-Ion P800	1
018546	All-in-one charger	1
900507	In-car charger	1
011773	Pulsa 800 Fuel Cell	1



- Steel decking fixing onto beam

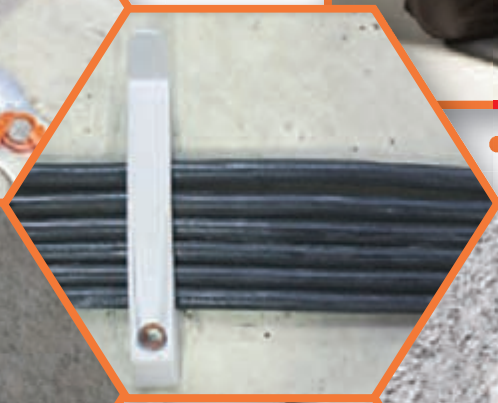


- Drywall track fixing onto steel

- Wall tie bracket fixing

● Cable management

● Electrical conduit saddle fixing



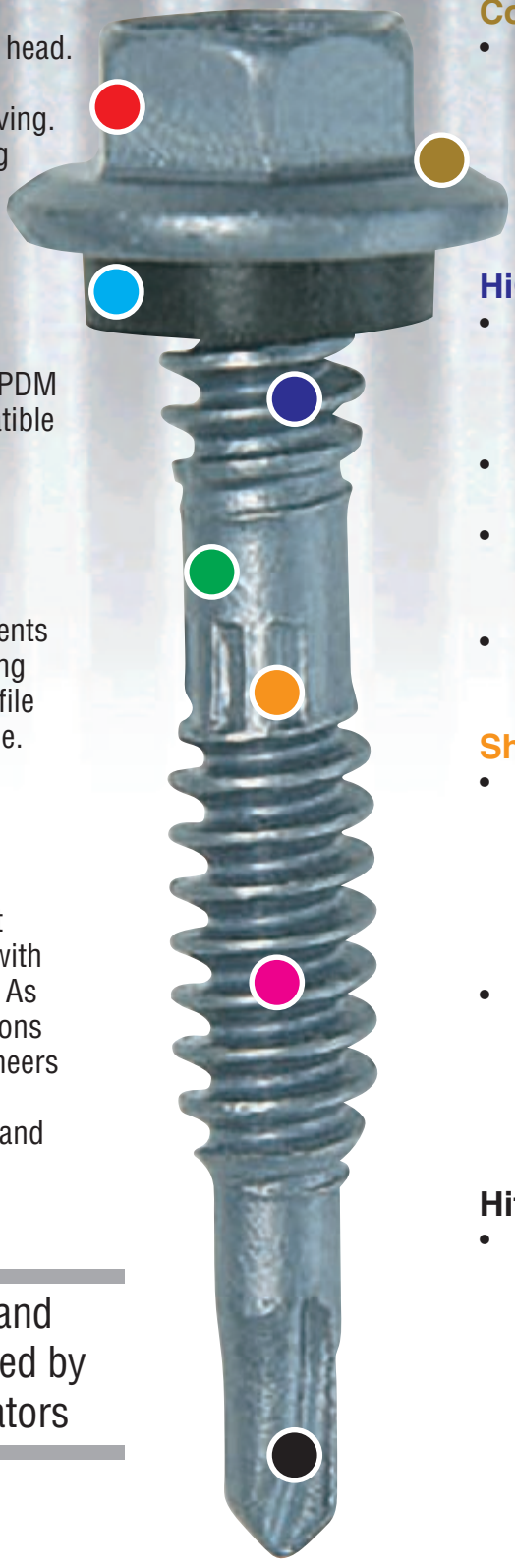
● Wire mesh fixing onto steel column

● Wood plank fixing onto concrete

● Local made pipe saddle

Buildex®

The brand that sets the standard



Hexagon Head Drive

- Integral hexagon washer head.
- Special head shape to avoid damage during driving.
- Underside has a retaining feature to captivate the seal.

Sealing Washer

- They are manufactured from a non conductive EPDM compound, made compatible for roofs exposed to corrosive environments.

Dwell Section

- Unthreaded section prevents the profile riding up during fixing and allows the profile to retain its original shape.

Thread

- Buildex fasteners are designed to give the best possible holding power with a low installation torque. As thinner high tensile sections are introduced, our engineers ensure that screws have optimum holding power and pullout strength.

Features invented and continuously improved by Buildex - the Innovators

Colormatch

- Buildex colormatch is a durable coating aimed to give a perfect match with your roof color.

HiGrip「高绑」

- Extrudes the roof material upwards around the fastener hole to prevent water from entering.
- Grips the roof to make a secure connection.
- Stops the roof sheet moving down the shank if the sheet is walked on.
- Ensures a water tight seal when fixing metal roofing.

Shankguard「螺杆保护段」

- When a corrosive micro climate exists beneath the roof, a damaged shank corrodes rapidly. This can occur at any time without warning, unnoticed.
- The unique shankguard feature enlarges the hole in the profile, avoiding damage to the protective coating on the shank beneath the roof.

Hiteks Drill Point

- Buildex Hiteks point was introduced in 1982 and progressively upgraded to meet the requirements such as, lower and loads, faster drilling & changing materials. Hiteks led the revolution in drill screw technology for more than a decade and continues to do so.

Buildex®

CORROSION MANAGEMENT

The Buildex® Solution

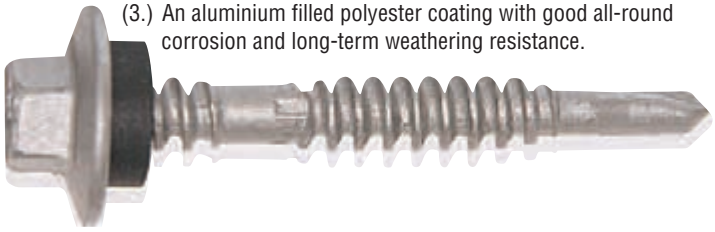
PROTECTION WITH Climaseal® 3

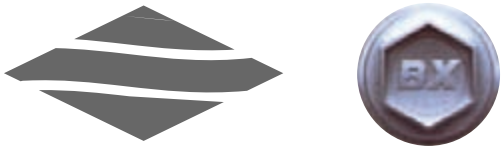
Climaseal®3 is an unique anti-corrosive coating system consisting of 3 distinct layers which combine to give exceptional corrosion protection:

(1.) A mechanically deposited zinc alloy coating giving excellent galvanic protection.

(2.) A chromate conversion coating to passivate the zinc alloy, further inhibiting coating loss.

(3.) An aluminium filled polyester coating with good all-round corrosion and long-term weathering resistance.





Designed to conform to AS3566 Class 3, real life atmospheric testing has confirmed that the performance of Climaseal®3 far exceeds the standard! If you want a fastener with a high-performance, corrosion resistant coating that won't let you down, consider these benefits:

- Minimal risk of coating damage during installation thanks to new, tougher coating formula.
- Better driving performance because of a smoother, harder finish.
- Superior performance in extreme temperatures, developed and tested in Australia for Australasian conditions.
- Effective sealing of roofing sheets/cladding and reduced corrosion with an improved black non-conductive EPDM seal. The black seal remains elastic in temperature extremes, and will not breakdown and allow water entry.

Climaseal®3 should be used for general external use in mild and moderate industrial, and mild marine applications

Climaseal® 4

THE ULTIMATE BARRIER

The ultimate anti-corrosion coating for roof fasteners and cyclone plates.

Real world testing has exposed many deficiences with the acceptance of coated finishes as "deem to comply", simply because of thickness and density measurements.

The new **Climaseal®4** coating is a layered system, combining both a high density sacrificial coating substrate. over which a barrier top coat has heen applied. The Climaseal®4 is then applied by a new, environmentally friendly, processing system.

Climaseal®4 meets and exceeds AS3566 Class 4 specifications. It should he used in coastal areas where salt, wind, UV and moisture are prevalent, in tropical zones and industrial areas. It is particularly recommended for use in moderate and severe marine environments.

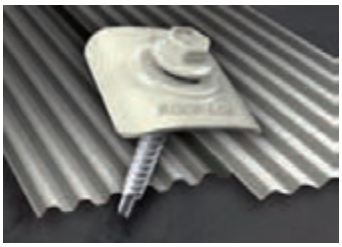
All Climaseal®4 coated screws are easily recognisable by their silver/blue appearance, the "BX4" marking on the screw head, and the blue stripe found on the label packaging of Buildex bulk boxes and trade packs.

Roof-Lok®

WIND SPEED MANAGEMENT

Corrugated and Square Roofing Cyclone Assembly

The Buildex® ROOF-LOK® Cyclonic Assembly has been specially designed to fasten both corrugated and square roofing profiles and provides ultimate performance in cyclonic conditions.



Ultimate Roof Holding Capability

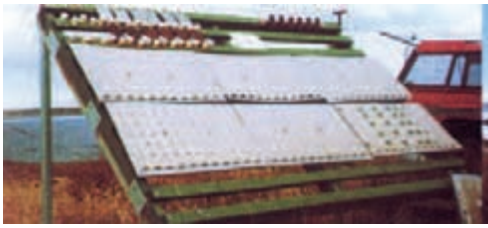
The large contact area of ROOF-LOK® dramatically improves the ability to hold down the roof, giving the roof the best chance of survival in a cyclone. The majority of Australian Rollformers put their roofing profiles through cyclonic Low-High-Low testing at James Cook University above 8 kPa wind load pressure using Buildex® cyclonic plates.This represents the standard for performance of their roofing profiles in cyclonic conditions.

*** Please contact Ramset Technical Department for detailed product information and size selection.**

Buildex®

DEVELOPMENT & TESTING PROGRAM

The only reliable way to determine corrosion performance is through Real World Testing. Buildex pioneered the use of "real world outdoor exposure testing for coatings development in 1994 and has continually developed and improved the performance of its coatings, providing superior corrosion protection.



- *Open rack - simulates conditions on a roof*

- *Sheltered rack - simulates under roof and non-rain washed situation*

Buildex operates and supports a research, development and testing program aimed at ensuring the customer and the building owner get the best value for money from the fasteners they purchase.

Real World Test Sites

In order to test the actual corrosion performance of our products, Buildex has three test sites and use a further four sites (operated by ITW Buildex & CSIRO).

These test sites are positioned at known corrosively aggressive locations around Australia.

Unlike accelerated laboratory testing, these sites expose the products to the combinations of corrosive influences that exist in the real world e.g.

- Chlorides (Marine)
- Humidity (Condensation)
- Acid Rain (Industrial)
- Ultra Violet (UV)

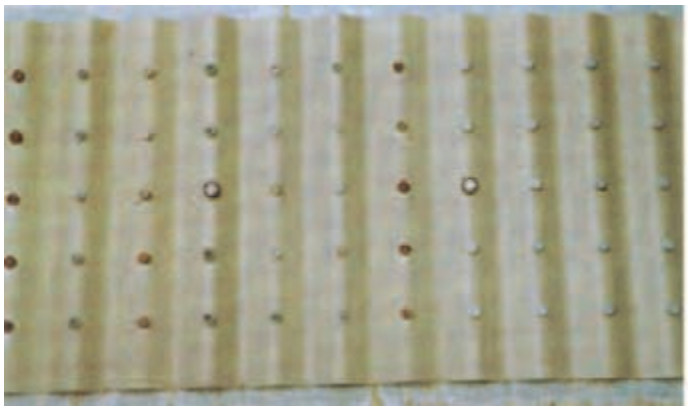
Scientific Monitoring

All the sites are scientifically monitored to determine the degree of corrosivity at each site. This is done independently by the CSIRO.

Results of Buildex Testing

Buildex has over 20 years experience with real world testing. Many of our products have been developed and improved as a direct result from what has been learned during the testing.

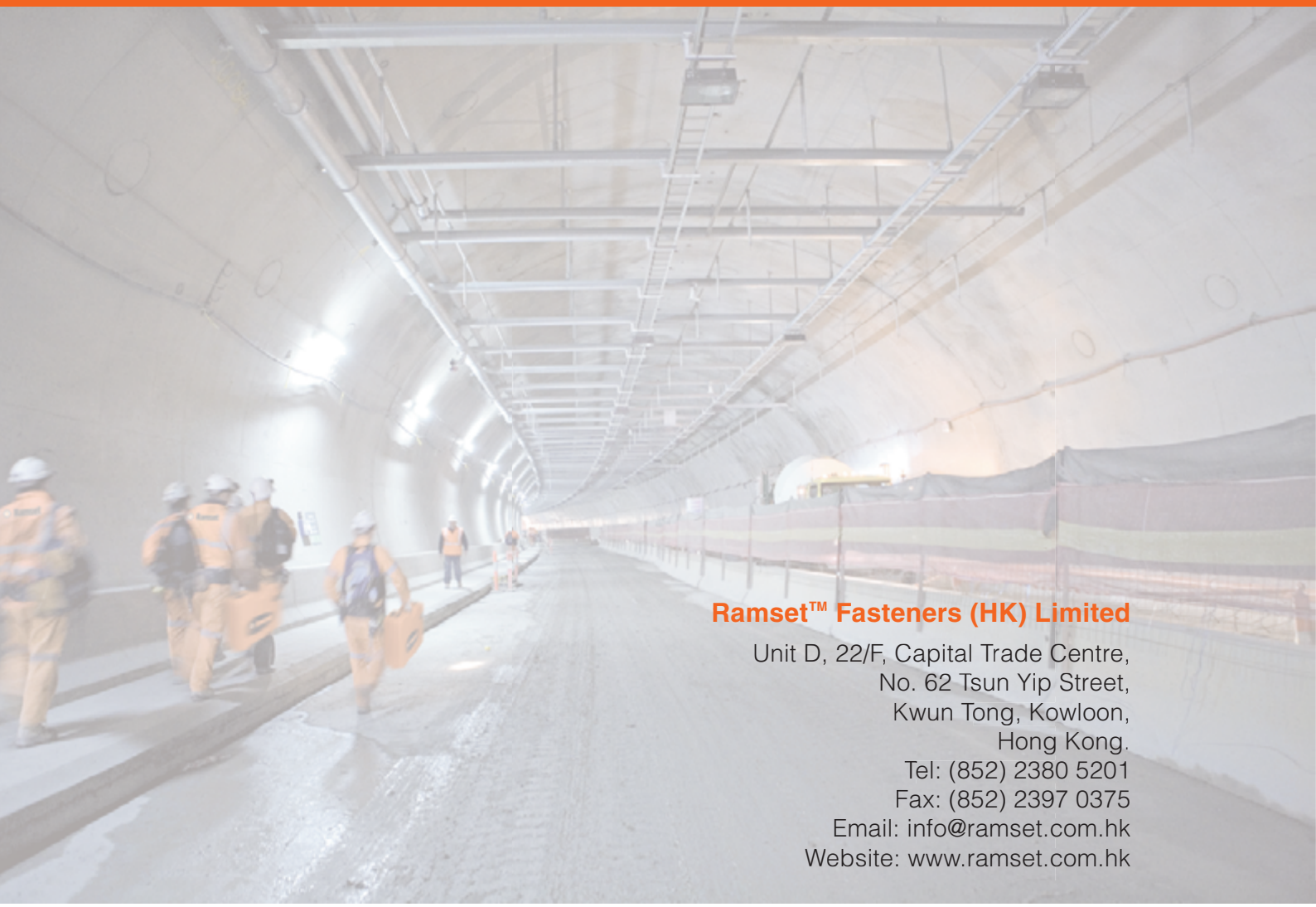
The severe conditions at these sites will give an indication of the product performance after approximately one year. The test also cover competitors' products.



This panel compares Buildex product coated in Climaseal 3 with our competitors. The exposure time is after twenty-one months. ***None of our competitors can compare with Buildex Climaseal 3.***

This is the same panel after an exposure time of thirty-three months. To meet Class 3, the maximum observable rust presence after an exposure time of thirty months is 5%. Buildex products with Climaseal 3 clearly exceed the standard ***only one product of the competitors' sample (circled) passes this test.***

Ramset™



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