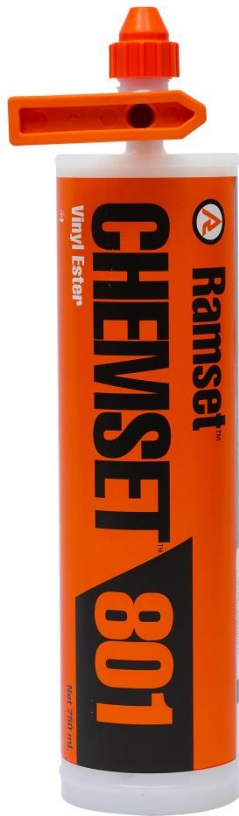


Date of Issue: April 27, 2016

**Fast Setting Vinyl Ester For Extreme Anchoring Applications**



**CHEMSET 801 XTREM is a heavy duty Vinyl Ester mortar certified for challenging engineering design conditions such as seismic, cracked concrete, tension zones and sustained loading.**

**Overview**

CHEMSET™ 801 is a fast setting, heavy duty anchoring mortar ideal for applications such as steel erection and hand rails, where torque needs to be applied quickly after installation.

The anchoring performance of CHEMSET™ 801 is assessed to ETAG 001-1,5 Option 1 and Annex E for cracked and uncracked concrete and seismic applications.

CHEMSET™ 801 may be installed in diamond core drilled and carbide drilled holes in concrete.

**Product Advantages**

|                                      |  |
|--------------------------------------|--|
| Fast Setting                         | Apply torque in less than 1 hour                                   |
| Wide variety of conditions           | Flooded, core drilled, low temperatures, cracked concrete, Seismic |
| Independently certified              | Peace of mind  |
| Styrene Free                         | Low VOC and Low odour  |
| 50 year design life                  | Security and peace of mind   |
| Certified for Drinking Water Contact | Suitable for water treatment facilities                            |



**Substrates**

- Solid Concrete

**Applicable Standards**

- ETAG001-1,5 Option 1, Annex E, C1
- SA TS101:2015
- 50 Year Design Life
- Sustained Loading
- AS/NZS4020

**Applications**

- Structural Steel Connections
- Raker Angles, Column Hold Down, Shelf Angles
- Road Stitching
- Public Seating, Hand Rails
- Fence and Balustrade posts
- House Frame Bottom Plates
- Close to Edge
- Safety Barriers
- Starter Bars

### Installation Properties

**LOAD RANKING\***

↑

DRY FLOODED

★★★★ ★★

**Rebar Size Range - ø8 to ø32**

**Threaded Bar Size Range - M8 to M30**

**Installation Temperature Range**

Adhesive: 5°C to 30°C

Substrate: 0°C to 40°C

### Anchoring Environments

|                                    |   |
|------------------------------------|---|
| <b>Hole Condition</b>              | Drilled holes          Cored holes          Flooded holes                               |
| <b>Anchoring Environment</b>       | Dynamic loading          Drinking water safe          Cracked concrete          Seismic |
| <b>Substrates</b>                  | Solid Concrete  |
| <b>Operating Temperature Range</b> | <p>Long Term: -40°C</p> <p>Max Short Term: 50°C</p> <p>80°C</p>                         |

\*Load Ranking is the relative load compared with other Chemical Anchoring products in the Ramset range and is intended to assist with product selection. The Load Ranking scale is from 1 (lowest) to 5 (highest) load capacity in tension. Load Ranking is not intended to assist with load design. For load capacity and design information, consult the **Ramset Specifiers Anchoring Resource** book available from Ramset in hard copy or download from the website.

### Working and Loading Times

| Substrate Temperature | Working Time | Time to Full Load Capacity |                        |
|-----------------------|--------------|----------------------------|------------------------|
|                       |              | Dry and Damp               | Flooded and Underwater |
| 5°C                   | 18 min       | 145 minutes                | 145 minutes            |
| 10°C                  | 10 min       | 85 minutes                 | 85 minutes             |
| 20°C                  | 6 min        | 50 minutes                 | 50 minutes             |
| 25°C                  | 5 min        | 40 minutes                 | 40 minutes             |
| 30°C                  | 4 min        | 35 minutes                 | 35 minutes             |

#### Material:

CHEMSET 801 consists of 2 parts: Part A is a mixture of Vinyl Ester polymer and inorganic filler. Part B is a Benzoyl Peroxide catalyst.

### Typical Properties

| Properties  | Typical Value  |
|---|--|
| Appearance  | Part A: White<br>Part B: Black<br>Mixed: Grey  |
| Density   | 1.67 kg / litre @ 20°C   |
| Heat Distortion Temperature (ISO 75)                | 77°C   |
| Shore D Hardness (ISO7619)                          | 90   |
| Compressive Strength (ASTM C579-01)                 | 77.8 MPa   |
| Tensile Strength (ASTM D638)                        | 15.2 MPa   |
| Flexural Strength (ASTM D638)                       | 29 MPa   |
| Coefficient of Linear Thermal Expansion (ASTM E831) | 50.3 x 10 <sup>-6</sup> /°C (20°C to 40°C)<br>57.3 x 10 <sup>-6</sup> /°C (20°C to 70°C) |

### Approvals

| Certification  | Approval Number / Report Number |
|--|---------------------------------|
| European Technical Assessment (ETA) 001-1,5 Option 1 | ETA 16/0283                     |
| AS/NZS4020-2005 Contact with Drinking Water          | AWQC 85026                      |

### Chemical Resistance

| Chemical Environment                | Concentration | Resistant | Non-Resistant |
|-------------------------------------|---------------|-----------|---------------|
| Aqueous Solution Acetic Acid        | 10%           | R         |               |
| Acetone                             | 100%          |           | NR            |
| Aqueous Solution Aluminium Chloride | Saturated     | R         |               |
| Aqueous Solution Aluminium Nitrate  | 10%           | R         |               |
| Ammonia Solution                    | 5%            | R         |               |
| Jet Fuel                            | 100%          | R         |               |
| Benzene                             | 100%          |           | NR            |
| Benzoic Acid                        | Saturated     | R         |               |
| Benzyl Alcohol                      | 100%          |           | NR            |
| Sodium Hypochlorite Solution        | 5 – 15%       | C         |               |
| Butyl Alcohol                       | 100%          | C         |               |
| Calcium Sulphate Aqueous Solution   | Saturated     | R         |               |
| Carbon Monoxide                     | Gas           | R         |               |
| Carbon Tetrachloride                | 100%          | C         |               |
| Chlorine Water                      | Saturated     | R         |               |
| Chloro Benzene                      | 100%          |           | NR            |
| Citric Acid Aqueous Solution        | Saturated     | R         |               |
| Cyclohexanol                        | 100%          | R         |               |
| Diesel fuel                         | 100%          | R         |               |
| Diethylene Glycol                   | 100%          | R         |               |
| Ethanol                             | 95%           | C         |               |
| Ethanol Aqueous Solution            | 20%           | C         |               |
| Heptane                             | 100%          | R         |               |
| Hexane                              | 100%          | C         |               |
| Hydrochloric Acid                   | 15%           | R         |               |
| Hydrochloric Acid                   | 25%           | C         |               |
| Hydrogen Sulphide Gas               | 100%          | R         |               |
| Isopropyl Alcohol                   | 100%          | C         |               |
| Linseed Oil                         | 100%          | R         |               |
| Lubricating Oil                     | 100%          | R         |               |
| Mineral Oil                         | 100%          | R         |               |
| Parafin / Kerosene (Domestic)       | 100%          | R         |               |
| Phenol Aqueous Solution             | 1%            |           | NR            |
| Phosphoric Acid                     | 50%           | R         |               |
| Potassium Hydroxide                 | 10% / pH 13   | C         |               |
| Sea Water                           | 100%          | R         |               |
| Styrene                             | 100%          |           | NR            |
| Sulphur Dioxide Solution            | 10%           | R         |               |
| Sulphur Dioxide (40°C)              | 5%            | R         |               |
| Sulphuric Acid                      | 10%           | R         |               |
| Sulphuric Acid                      | 50%           | R         |               |
| Turpentine                          | 100%          | C         |               |
| White Spirit                        | 100%          | R         |               |
| Xylene                              | 100%          |           | NR            |

**Key:**

- R** Retains 80% of properties when exposed up to 75°C
- C** Occasional contact up to 25°C

### Storage and Shelf Life

Shelf life is 12 months from date of manufacture stored in a cool, dry place between 5°C and 25°C away from direct sunlight. See USE BY date on package.

### Product Range – ChemSet™ 801 Anchoring Adhesive

| Description                               | Part No | Order Quantity |
|---|---------|----------------|
| ChemSet™ 801 Cartridge 380 ml + 2 Nozzles | C801C   | 20             |
| ChemSet™ 801 Jumbo 750 ml + 2 Nozzles     | C801J   | 12             |
| ChemSet™ Universal Applicator             | CUAP    | 1              |
| ChemSet™ Universal 18V Battery Applicator | CUAR18  | 1              |
| Mixing Nozzles for Non-Epoxies            | ISNP    | 5              |

### Installation Details – Post Installed Reinforcing Bar in Solid Concrete

Refer to Engineer's drawings for specified dimensions. In the absence of Engineer specification, the following dimensions are required. Refer to Ramset Specifier's Anchoring Resource Book for load design (Available from Ramset™ or the website [www.ramset.com.au](http://www.ramset.com.au))

| Bar Size | Drill Hole Size, $d_h$ (mm) | Minimum Drill Hole Depth in Substrate (mm) | Minimum Edge Distance, $e_c$ (mm) | Minimum Anchor Spacing, $a_c$ (mm) | Minimum Structural Thickness, $b_m$ (mm) |
|----------|-----------------------------|--|-----------------------------------|------------------------------------|--|
| ø10      | 14                          | 70   | 40                                | 60                                 | 100                                      |
| ø12      | 16                          | 90   | 50                                | 70                                 | 120                                      |
| ø16      | 20                          | 120  | 65                                | 100                                | 160                                      |
| ø20      | 25                          | 150  | 80                                | 120                                | 200                                      |
| ø24      | 30                          | 180  | 100                               | 145                                | 240                                      |
| ø28      | 35                          | 210  | 115                               | 170                                | 280                                      |
| ø32      | 40                          | 240  | 130                               | 195                                | 320                                      |
| ø36      | 45                          | 270  | 145                               | 220                                | 360                                      |
| ø40      | 50                          | 300  | 160                               | 240                                | 400                                      |



Table 1. Chemical Anchor Installation Details for Post-Installed Reinforcing Bar in solid Concrete

### Installation Details – Threaded Bar and ChemSet™ Anchors Studs in Solid Concrete

Refer to Engineer's drawings for specified dimensions. In the absence of Engineer specification, the following dimensions are required. Refer to Ramset Specifier's Anchoring Resource Book for load design (Available from Ramset™ or the website [www.ramset.com.au](http://www.ramset.com.au))

| Thread Size | Drill Hole Size, $d_h$ (mm) | Drill Hole Depth in Substrate (mm) | Maximum Fixture Clearance (mm) | Maximum Fixture Thickness (mm) | Tightening Torque, $T_r$ (Nm) | Minimum Edge Distance, $e_c$ (mm) | Minimum Anchor Spacing, $a_c$ (mm) | Minimum Structural Thickness, $b_m$ (mm) |
|-------------|-----------------------------|------------------------------------|--------------------------------|--------------------------------|-------------------------------|-----------------------------------|------------------------------------|--|
| M8          | 10                          | 80                                 | 10                             | 15                             | 10                            | 35                                | 50                                 | 100                                      |
| M10         | 12                          | 90                                 | 12                             | 25                             | 20                            | 40                                | 60                                 | 120                                      |
| M12         | 14                          | 110                                | 15                             | 30                             | 40                            | 50                                | 75                                 | 140                                      |
| M16         | 18                          | 125                                | 20                             | 40                             | 95                            | 65                                | 100                                | 160                                      |
| M20         | 24                          | 150                                | 24                             | 80                             | 180                           | 80                                | 120                                | 190                                      |
|             |                             | 170                                |                                |                                |                               |                                   |                                    | 220                                      |
| M24         | 26                          | 160                                | 28                             | 105                            | 315                           | 100                               | 145                                | 200                                      |
|             |                             | 210                                |                                |                                |                               |                                   |                                    | 270                                      |
| M30         | 32                          | 270                                | 32                             | -                              | 650                           | 120                               | 180                                | 300                                      |
| M36         | 38                          | 330                                | 38                             | -                              | 1150                          | 145                               | 220                                | 365                                      |



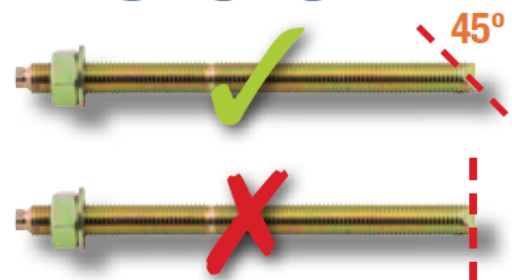
Table 2. Chemical Anchor Installation Details for Threaded Bar and ChemSet™ Anchor Studs in solid Concrete

### Installation Details – Precautions

Read safety directions on the pack and the MSDS before opening or using. In general, wear safety goggles, gloves and hearing protection when drilling and using chemical anchoring adhesive.

Before you start:

- Do not install chemical anchor into concrete less than 3 days old
- Chemical anchor may be installed in concrete aged between 3 and 28 days but will not carry full load capacity until concrete is at least 28 days old.
- Threaded rod must have one end cut at approximately 45° to prevent unthreading from the cured adhesive



### Installation Details – Drilling



Drilled holes



Cored holes

- Consult engineers drawings for hole dimensions; otherwise refer to table 1 (Post Installed Rebar) and table 2 (Threaded Bar) above
- Drill hole to specified dimensions using carbide drill bit or diamond core as appropriate
- Ramset™ Dustless Drilling System is recommended as the fastest most certain method of removing drilling debris and dust and eliminates post-drilling hole cleaning.
- Otherwise drilling debris and dust must be removed by brushing and blowing out of drilled holes as described below.

### Hole Cleaning – Carbide Drilled

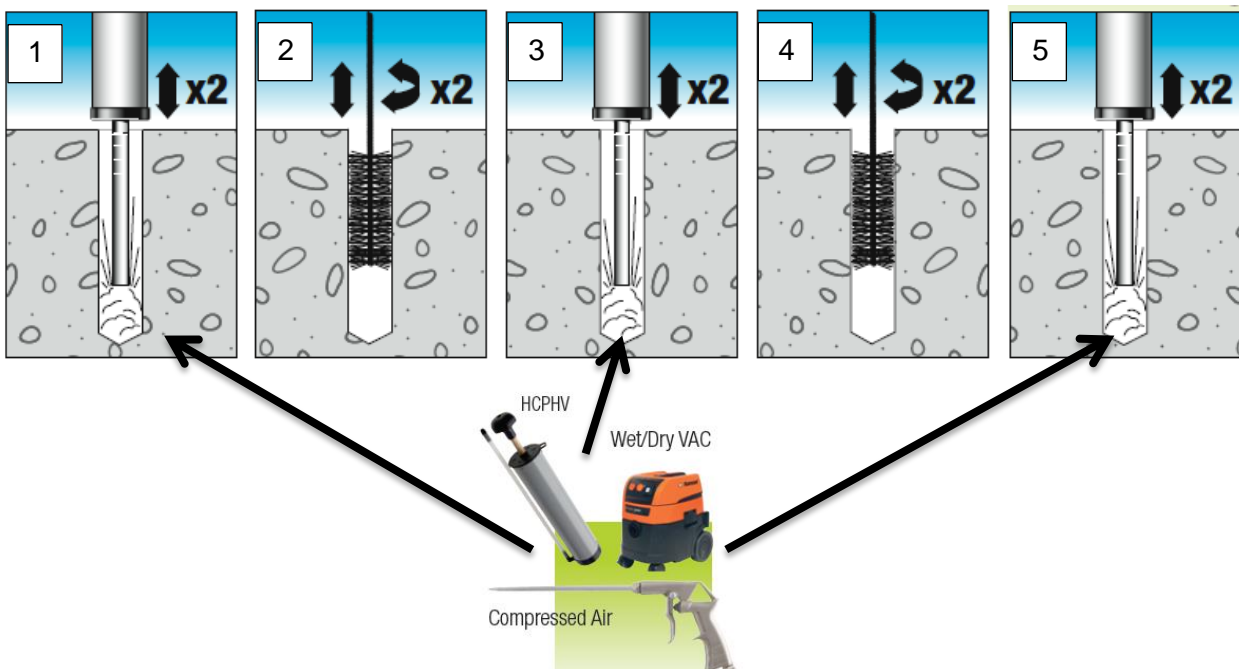


Carbide Drilled

Dust removal and cleaning is not required with Ramset™ Dustless Drilling System.

Drilling debris and dust must be removed from holes drilled with standard carbide as follows:

1. Using Ramset™ blower (Part Number HCPHV), compressed air blast or wet / dry vacuum (Ramset™ AC1630P), remove dust with 2 swift pumps.
2. Using the appropriate sized brush, with a twisting / rotating motion, insert brush to the bottom of the hole and remove 2 times.
3. Remove dust residue with air blower (2 pumps), compressed air blast or wet / dry vacuum.
4. Repeat brushing per step 2
5. Repeat blowing out residual dust per step 3



If holes are left for more than 24 hours after cleaning, they must be cleaned again (including holes drilled with Dustless Carbide)



### Hole Cleaning – Core Drilled or Flooded Holes



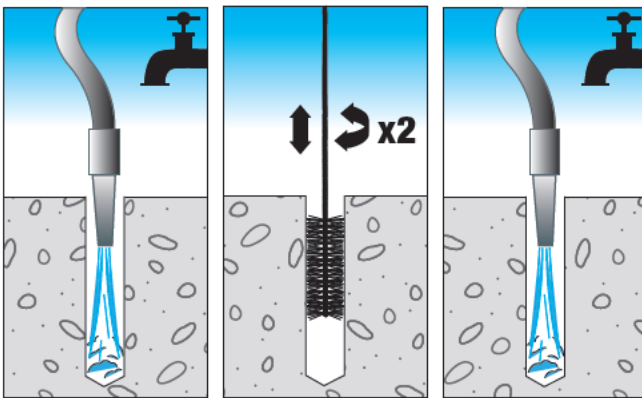
Cored holes



Flooded holes

Remove dust and drilling debris from flooded holes as follows:

1. Flush holes with clean running water until water is clear.
2. Using the appropriate sized brush, with a twisting / rotating motion, insert brush to the bottom of the hole and remove 2 times.
3. Flush holes with clean running water until water is clear.

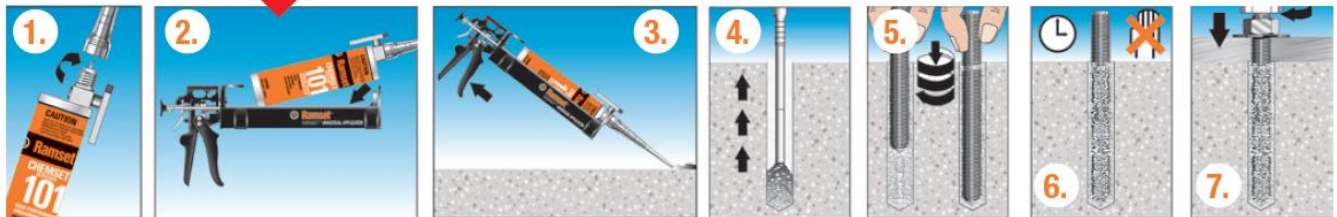


### Opening And Using Cartridge

Manual CUAP

18V Battery CUAR18

Pneumatic CUAPN

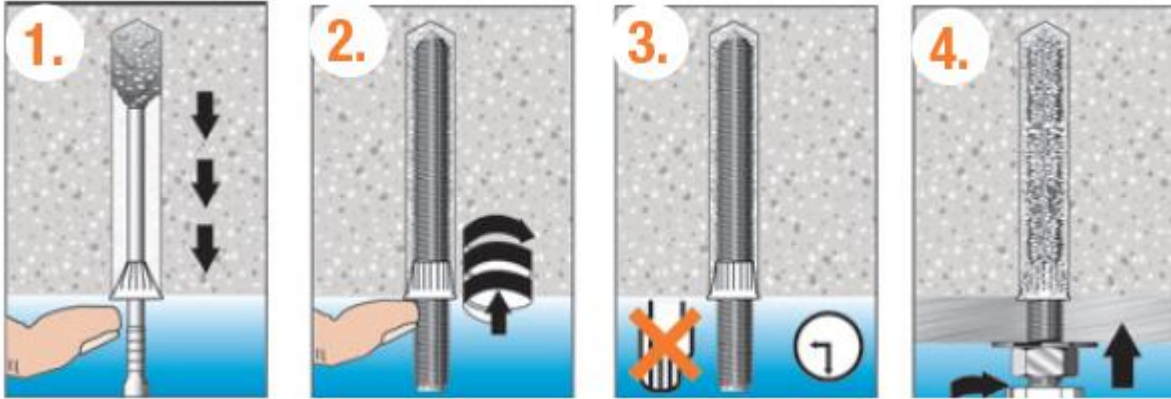


1. Remove cap from cartridge and attach mixing nozzle Part Number ISNP
2. Load cartridge into dispensing gun (Ramset Part Numbers CUAP (Manual), CUAPN (Pneumatic) and CUAR18 (18V Battery Powered))
3. Dispense a small quantity of adhesive (2 to 3 trigger pulls) to waste to ensure both adhesive components are balanced
4. Insert mixing nozzle tip to bottom of hole (to avoid air bubbles) and inject adhesive. Gradually withdraw nozzle to keep the nozzle tip at the surface of the adhesive. Continue injecting until hole is about  $\frac{3}{4}$  filled
5. Insert fixing using a twisting / rotating motion into adhesive and wipe away any excess
6. Allow adhesive to cure. Refer to Working and Loading Times table on Page 2
7. Load anchor and apply torque (to threaded fixings) after appropriate cure time



### Overhead Installation

Note: Dustless carbide system is recommended to eliminate falling dust and debris during overhead drilling. Retaining collars are available from Ramset™ for M12 (P/N ISR12) and M16 (P/N ISR16) threaded rod. For other threaded rod sizes and rebar, use plastic wedges after the anchor has been installed.



1. Insert mixing nozzle tip to bottom of hole (to avoid air bubbles) and inject adhesive. If using retaining collar, place it in the hole and insert nozzle as illustrated. Gradually withdraw nozzle to keep the nozzle tip at the surface of the adhesive. Continue injecting until hole is about  $\frac{3}{4}$  filled. Dosing Cap (Part Number 055969) is recommended for deep holes and hole diameters > 18 mm.
2. Insert fixing using a twisting / rotating motion into adhesive and wipe away any excess. Retaining collar will hold rod in place while adhesive sets. With no retaining collar, hold fixings in place by inserting 4 x plastic wedges between the fixing and the concrete.
3. Allow adhesive to cure. Refer to Working and Loading Times table on Page 2
4. Load anchor and apply torque (to threaded fixings) after appropriate cure time.

### Transport and Storage

Classified as flammable for transport and storage.  
Class 3 (Flammable), Packaging Group III according to Australian Dangerous Goods code.

### Occupational Health and Safety



- ◆ Avoid contact with skin and eyes
- ◆ Avoid breathing vapour
- ◆ Wear protective gloves when mixing or using.
- ◆ If poisoning occurs, contact a doctor or Poisons Information Centre.
- ◆ If swallowed, **do not** induce vomiting. Give glass of water.
- ◆ If skin contact occurs, remove contaminated clothing and wash skin thoroughly.
- ◆ If in eyes, hold eyes open, flood with water for at least 15 minutes and seek medical assistance.
- ◆ **Do not** use in poorly ventilated or confined space.

For more detailed information refer to the Material Safety Data Sheet available from Ramset or the website.

# CHEMSET™ ACCESSORIES

## Fixings – Chemset™ Anchor Studs



### ChemSet™ Anchor Studs

| Thread Size | Description                         | Zn<br>ZINC | GAL<br>Galvanised | A4<br>316<br>Stainless<br>Steel 316 | Box<br>Quantity |
|-------------|-------------------------------------|------------|-------------------|-------------------------------------|-----------------|
| M8          | ChemSet™ Anchor Stud M8 x 110 Zinc  | CS08110    | CS08110GH         | CS08110SS                           | 10              |
| M10         | ChemSet™ Anchor Stud M10 x 130 Zinc | CS10130    | CS10130GH         | CS10130SS                           | 10              |
| M12         | ChemSet™ Anchor Stud M12 x 160 Zinc | CS12160    | CS12160GH         | CS12160SS                           | 10              |
| M12         | ChemSet™ Anchor Stud M12 x 180 Zinc | CS12180    |                   |                                     | 10              |
| M16         | ChemSet™ Anchor Stud M16 x 190 Zinc | CS16190    | CS16190GH         | CS16190SS                           | 10              |
| M20         | ChemSet™ Anchor Stud M20 x 260 Zinc | CS20260    | CS20260GH         | CS20260SS                           | 6               |
| M24         | ChemSet™ Anchor Stud M24 x 300 Zinc | CS24300    | CS24300GH         | CS24300SS                           | 6               |

### ChemSet™ Anchor Studs Range

## Fixings – Chemset™ Threaded Inserts



### Threaded Inserts

| Thread Size | Description               | Drilling Dimensions |            | Zn<br>ZINC | A4<br>316<br>Stainless<br>Steel 316 | Box Quantity |
|-------------|---------------------------|---------------------|------------|------------|-------------------------------------|--------------|
|             |                           | Diameter (mm)       | Depth (mm) |            |                                     |              |
| M8          | Threaded Insert M8 x 60   | 14                  | 65         | 062770     | 062860                              | 10           |
| M10         | Threaded Insert M10 x 65  | 20                  | 70         | 062480     | 062960                              | 10           |
| M12         | Threaded Insert M12 x 75  | 24                  | 75         | 062760     | 063100                              | 10           |
| M16         | Threaded Insert M16 x 125 | 28                  | 130        | 062800     | 051175                              | 10           |
| M20         | Threaded Insert M20 x 170 | 35                  | 175        | 062810     | -                                   | 10           |

### ChemSet™ Threaded Inserts Range

## Hole Cleaning Accessories


| Description                      | To Suit                   | Part Number | Pack Quantity |
|----------------------------------|---------------------------|-------------|---------------|
| Hole Cleaning Pump (High Volume) | All hole sizes            | HCPHV       | 1             |
| Hole Cleaning Brush 13 mm        | 8 – 12 mm Diameter Holes  | HCBT13      | 1             |
| Hole Cleaning Brush 20 mm        | 14 – 20 mm Diameter Holes | HCBT20      | 1             |
| Hole Cleaning Brush 26 mm        | 20 – 24 mm Diameter Holes | HCBT26      | 1             |
| Hole Cleaning Brush 20 mm x 1m   | 14 – 20 mm Diameter Holes | HCBT261000  | 1             |
| Hole Cleaning Brush 26 mm x 1m   | 20 – 24 mm Diameter Holes | HCBT201000  | 1             |
| Hole Cleaning Brush 36 mm x 1m   | 26 – 34 mm Diameter Holes | HCBT361000  | 1             |
| Hole Cleaning Brush 42 mm x 1m   | 36 – 40 mm Diameter Holes | HCBT421000  | 1             |

### ChemSet™ Hole Cleaning Accessories

### Ramset™ R3™ Dustless Drilling Carbide

Suitable for use with all SDS-Max Hammer Drills and professional worksite vacuum cleaners (Ramset™ AC1630P)

| Part No.  | Type  | Size (mm) | Hole Depth (mm) | Drill Length (mm) |
|-----------|-------|-----------|-----------------|-------------------|
| DDEM14400 | U3Max | 14        | 400             | 600               |
| DDEM16400 | U3Max | 16        | 400             | 600               |
| DDEM18400 | R3Max | 18        | 400             | 600               |
| DDEM20400 | R3Max | 20        | 400             | 600               |
| DDEM22400 | R3Max | 22        | 400             | 600               |
| DDEM25400 | R3Max | 25        | 400             | 600               |
| DDEM28400 | R3Max | 28        | 400             | 600               |
| DDEM30400 | R3Max | 30        | 400             | 600               |
| DDEM32400 | R3Max | 32        | 400             | 600               |
| DDEM35400 | R3Max | 35        | 400             | 600               |



### Ramset™ Dustless Drilling Carbide Bits

To purchase or obtain further information contact *Ramset* or your nearest *Ramset* distributor

NEW ZEALAND  
 PHONE: 0800 726 738  
 WEB: [www.ramset.co.nz](http://www.ramset.co.nz)

AUSTRALIA  
 PHONE: 1300 780 063  
 WEB: [www.ramset.com.au](http://www.ramset.com.au)

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