



OPTIMUM ANCHORING SOLUTIONS™



NEW



ChemSet™ Epcon™ G5™ XTREM™

The next gen pure-epoxy anchoring system for structural fixings, delivering strong, reliable bonds in Seismic C2 scenarios.

- ✓ Pure-epoxy formulation for maximum structural strength.
- ✓ ETA approved for 100 year working life in dry, wet and flooded holes.
- ✓ All-weather dispensing for consistent results.
- ✓ 100% Australian made and manufactured—ensuring faster lead times & reliable supply.
- ✓ Same day fixing & loading with 7-hour curing in dry concrete (at 20°C).
- ✓ Bold Ramset Orange colour for fast visual checks and on-site compliance
- ✓ Engineering support & design assistance on your fingertips

**BUILT STRONG.
HOLDS EVERYWHERE.™**

Turn over for
more details >

Learn more about Ramset
www.ramset.co.nz



Tel. +84 914 915 286

What's New in ChemSet Epcon G5 Xtrem

ChemSet Epcon G5 Xtrem introduces a new formulation designed to improve performance, consistency, and on site usability. The refreshed packaging has been carefully considered to deliver a more cohesive range, clearer identification, and a stronger alignment with the Ramset brand.



Key Product Enhancements

1. The 'Xtrem' designation aligns with our broader seismic chemical and mechanical anchoring range.
2. Improved no-leak cartridge featuring embossed Ramset and ChemSet branding, now including O-rings.
3. Uniform cartridge design implemented across the entire range.
4. Product colour updated to orange to align with the Ramset brand.
5. All products are now supplied in inners and includes 1 ISNE nozzle to all retailers.
6. ChemSet branding delivers a cohesive, uniform look across the full chemical portfolio.
7. Mixed, filled and packaged on the production line at Chirnside Park.
8. Unique cartridge ID coding ensures complete traceability from factory to fix.



| Item Code | Barcode | Material Type | Carton Qty | Pallet Qty | Pack Size |
|-----------|---------------|---------------|------------|------------|-----------|
| CEG5X600 | 9310086547902 | Pure Epoxy | 12 | 432 | 600 ml |

ChemSet™ EPCON™ G5 Xtrem™

SEISMIC ANCHOR STUDS - CHEMICAL INJECTION

AVAILABLE IN NEW ZEALAND ONLY

(Australia refer to ChemSet™ Reo502™ Xtrem™ range)

GENERAL INFORMATION

| Performance Related | Material Specification | Installation Related |
|---------------------|------------------------|----------------------|
|---------------------|------------------------|----------------------|



Product

EPCON™ G5 Xtrem™ is a heavy duty pure Epoxy for anchoring threaded studs and reinforcing bar into cracked and uncracked concrete.



Compliance

European Technical Assessment (option 1) - ETA-25/0648

Design according to:

- NZS 1170.5 - Earthquake Actions
- EN 1992-4 (formerly ETAG001 Annex C, E & TR045)
- NZS 3101 (A3) Section 17 - Seismic Design C1 & C2
- Use enclosed data for simplified calculation method

Use Ramset™ iExpert Anchor Software for optimised calculation or where a greater range of anchor layout detail is needed.

Benefits, Advantages and Features

- 100 year working life

Greater productivity:

- Anchors in dry, damp, wet or flooded holes
- Easy dispensing even in cold weather

Greater security:

- Strong bond
- Rated for sustained loading

Versatile:

- Anchors in carbide drilled and diamond drilled holes
- Cold and temperate climates

Greater safety:

- Low odour
- VOC Compliant
- Suitable for contact with drinking water



Principal Applications

- Threaded Studs
- Starter Bars
- Threaded Inserts
- Over-head installation
- Steel Columns
- Hand Rails
- Road Stitching

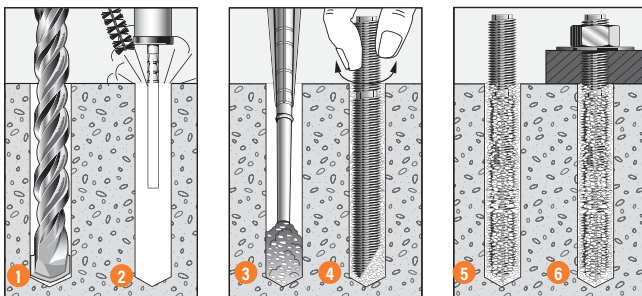
Recommended Installation Temperatures

| | Minimum | Maximum |
|-----------|---------|---------|
| Substrate | 5°C | 40°C |
| Adhesive | 5°C | 40°C |

Service Temperature Limits

| |
|--------------------|
| T1: -40°C to +40°C |
| T2: -40°C to +60°C |
| T3: -40°C to +75°C |

Installation



1. Drill recommended diameter and depth hole.
2. **Important:** For hammer drilling technique clean dust and debris from hole with stiff wire brush and blower in the following sequence: blow x 2, brush x 2, blow x 2, brush x 2, blow x 2. For diamond drilling technique refer to **ETA-25/0648**.
3. Screw mixing nozzle onto cartridge and dispense adhesive to waste until colour is orange. Insert mixing nozzle to bottom of hole. Fill hole to 2/3 the hole depth slowly, ensuring no air pockets form.
4. Insert **Ramset™ ChemSet™ Anchor Stud/rebar** to bottom of hole while turning.
5. Allow ChemSet™ EPCON™ G5 Xtrem™ to cure as per setting times.
6. Attach fixture.

Setting Times

| Temperature of base material | Gel Time | Curing time in dry concrete | Curing time in wet and flooded concrete |
|------------------------------|----------|-----------------------------|---|
| 5°C | 75 min | 30h | 60 h |
| 10°C | 45 min | 22h | 44 h |
| 15°C | 35 min | 14h | 28 h |
| 20°C | 22 min | 7h | 14 h |
| 25°C | 14 min | 5h | 10 h |
| 30°C | 8 min | 4h | 8 h |
| 35°C | 6 min | 3h | 6h |
| 40°C | 4 min | 2h 45min | 5h 30min |

Seismic Anchors - ChemSet™ EPCON™ G5 Xtrem™ - Anchor Studs

ChemSet™ EPCON™ G5 Xtrem™

SEISMIC ANCHOR STUDS - CHEMICAL INJECTION

AVAILABLE IN NEW ZEALAND ONLY

Installation and performance details: ChemSet™ EPCON™ G5 Xtrem™ and ChemSet™ Anchor Studs

| Anchor size, d _b (mm) | Drilled hole diameter, d _h (mm) | Fixture hole diameter, d _f (mm) | Anchor effective depth, h _a (mm) | Tightening torque, T _r (Nm) | Optimum dimensions* | | Concrete substrate thickness, b _m (mm) | Seismic C1 & C2 Cracked Concrete reduced characteristic tensile capacity, N _{Rd,seis} (kN) ** | | | | | |
|----------------------------------|--|--|---|--|--------------------------------------|-------------------------------------|---|--|------|--------|------|--------|------|
| | | | | | Anchor* spacing, a _c (mm) | Edge* distance, e _c (mm) | | Concrete Compressive Strength, f _c | | | | | |
| | | | | | | | | 20 MPa | | 30 MPa | | 40 MPa | |
| | | | | | | | | C1 | C2 | C1 | C2 | C1 | C2 |
| M10 | 12 | 12 | 90 | 20 | 270 | 135 | 120 | 9.9 | 6.4 | 9.9 | 6.4 | 9.9 | 6.4 |
| M12 | 14 | 14 | 110 | 30 | 330 | 165 | 140 | 19.9 | 12.2 | 20.2 | 12.2 | 20.2 | 12.2 |
| M16 | 18 | 18 | 125 | 60 | 375 | 188 | 161 | 24.1 | 14.6 | 29.5 | 14.6 | 33.1 | 14.6 |
| M20 | 25 | 22 | 170 | 120 | 510 | 255 | 214 | 38.2 | 23.0 | 46.7 | 23.0 | 54.0 | 23.0 |
| M24 | 28 | 26 | 210 | 150 | 630 | 315 | 262 | 52.4 | 26.0 | 64.2 | 26.0 | 74.1 | 26.0 |
| M30 | 35 | 33 | 280 | 180 | 840 | 420 | 350 | 80.7 | 71.8 | 98.8 | 71.8 | 114.1 | 71.8 |

All data relevant for Dry and Wet Holes. For Flooded Holes MULTIPLY N_{Rd,seis} X 0.62

* For anchor spacings or edge distances less than the minimum, please refer to the simplified strength limit state design process to verify capacity.

** Tension values are based on service temperature limits -40°C to +40°C only. If service temperature limits is beyond this range please contact Ramset Engineer.

** Note: Seismic Cracked concrete combined pull-out and concrete cone resistance, tension = N_{Rd,seis}⁰ = α_{Nseis} N_{Rk,p,seis}⁰ / γ_{Msp} where γ_{Msp} = 1.5

| Anchor size, d _b (mm) | Reduced Characteristic Capacity | | | | | | | | | | | |
|----------------------------------|-------------------------------------|------|---|-------------------------------------|------|---|-------------------------------------|------|---|-------------------------------------|------|---|
| | Grade 5.8 Steel Studs | | | Grade 8.8 Steel Studs | | | ANSI 316 Stainless Steel Studs | | | HCR 1.4529 Stainless Steel Studs | | |
| | Shear, V _{Rd,s,seis} (kN)# | | Tension, N _{Rd,s,seis} (kN)*** | Shear, V _{Rd,s,seis} (kN)# | | Tension, N _{Rd,s,seis} (kN)*** | Shear, V _{Rd,s,seis} (kN)# | | Tension, N _{Rd,s,seis} (kN)*** | Shear, V _{Rd,s,seis} (kN)# | | Tension, N _{Rd,s,seis} (kN)*** |
| | C1 | C2 | C1 & C2 | C1 | C2 | C1 & C2 | C1 | C2 | C1 & C2 | C1 | C2 | C1 & C2 |
| M10 | 3.5 | 3.9 | 19.3 | 5.5 | 6.3 | 30.9 | 3.9 | 4.4 | 21.7 | 4.8 | 5.5 | 27.1 |
| M12 | 6.0 | 6.1 | 28.1 | 9.6 | 9.8 | 44.9 | 6.8 | 6.8 | 31.6 | 8.4 | 8.5 | 39.3 |
| M16 | 10.9 | 10.7 | 52.3 | 17.5 | 17.1 | 83.7 | 12.3 | 12.0 | 58.8 | 15.3 | 15.0 | 73.3 |
| M20 | 17.1 | 16.7 | 81.7 | 27.3 | 26.7 | 130.7 | 19.2 | 18.7 | 91.7 | 23.9 | 23.4 | 114.3 |
| M24 | 18.9 | 17.8 | 117.7 | 30.3 | 28.5 | 188.3 | 21.2 | 20.0 | 132.1 | 26.5 | 25.0 | 164.7 |
| M30 | 30.1 | 30.1 | 187.0 | 48.1 | 45.8 | 299.2 | 33.7 | 32.1 | 210.0 | 42.1 | 40.1 | 261.8 |

***Note: Seismic Cracked Concrete steel resistance, tension = N_{Rd,s,seis}⁰ = α_{Nseis} N_{Rk,s,seis}⁰ / γ_{Ms} (kN) where γ_{Ms} = 1.5 (Grade 5.8 & 8.8 steel), γ_{Ms} = 1.87 (A4 316 SS) and γ_{Ms} = 1.5 (HCR 1.4529 stainless steel)

Note: Shear Data includes annular gap reduction factor of 0.5

For optimised performance data, including performance based on diamond drilling technique, please use Ramset iExpert Anchoring Software.

DESCRIPTION AND PART NUMBERS

| Description | Cartridge Size | Part No. |
|---------------------------|----------------|----------|
| ChemSet™ EPCON™ G5 Xtrem™ | 600ml | CEG5X600 |

ENGINEERING PROPERTIES ChemSet™ Anchor Studs and Threaded Rod

| Anchor Size, d _b | Grade 8.8 Threaded Rod | | | | Stainless Steel High Corrosion Resistance HCR Grade 1.4529/1.4565 Threaded Rod | | | | Section modulus Z (mm ³) |
|-----------------------------|-------------------------------------|----------------------------------|-----------------------------------|------------------------|---|----------------------------------|-----------------------------------|------------------------|--------------------------------------|
| | Shank diameter, d _s (mm) | Stressed Area (mm ²) | Yield Strength f _y MPa | UTS f _u MPa | Shank diameter, d _s (mm) | Stressed Area (mm ²) | Yield Strength f _y MPa | UTS f _u MPa | |
| M10 | 8.6 | 58 | 640 | 800 | 8.2 | 52.8 | 450 | 650 | 62.3 |
| M12 | 10.4 | 84.3 | 640 | 800 | 10 | 78.5 | 450 | 650 | 109.2 |
| M16 | 14.1 | 157 | 640 | 800 | 14 | 153.9 | 450 | 650 | 277.5 |
| M20 | 17.7 | 245 | 640 | 800 | 17.2 | 232.4 | 450 | 650 | 540.9 |
| M24 | 21.2 | 353 | 640 | 800 | 20.7 | 336.5 | 450 | 650 | 935.5 |
| M30 | 26.7 | 561 | 640 | 800 | - | - | - | - | - |

Refer to "Engineering Properties" for ChemSet™ Anchor Studs Grade 5.8 and AISI 316 Stainless Steel in the SARB ANZ.

ChemSet™ EPCON™ G5 Xtrem™

STRENGTH LIMIT STATE DESIGN

AVAILABLE IN NEW ZEALAND ONLY

STEP 1

Select anchor to be evaluated

Table 1a Indicative combined loading - interaction diagram

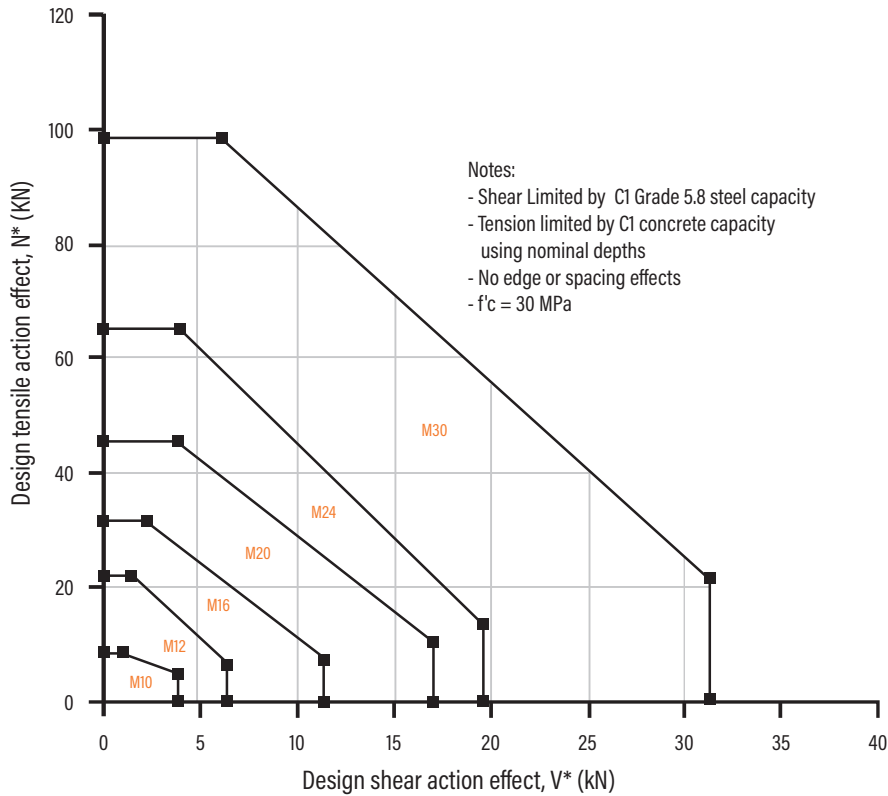


Table 1b Absolute minimum edge distance and anchor spacing values, e_m and a_m (mm)

| Anchor size, d_b | M10 | M12 | M16 | M20 | M24 | M30 |
|-----------------------------|-----|-----|-----|-----|-----|-----|
| Min. Anchor Spacing - a_m | 40 | 50 | 70 | 85 | 90 | 140 |
| Min. Edge Distance - e_m | 40 | 40 | 45 | 55 | 60 | 90 |

Step 1c Calculate anchor effective depth, h (mm)

Refer to "Description and Part Numbers" table for ChemSet™ Anchor Studs page in the SARB ANZ.

Effective depth, h (mm)

Preferred $h = h_n$ otherwise,

$h = L_e - t$

t = total thickness of material(s) being fastened.

| Substrate thickness b_m (mm) | | |
|-------------------------------------|-----|----------------------|
| Anchor Stud Size (mm) | | |
| M10 | M12 | M16 to M30 |
| $h + 30\text{mm} \geq 100\text{mm}$ | | $h + (2 \times d_n)$ |

Checkpoint 1

Anchor size determined, absolute minima compliance achieved, effective depth (h) calculated.

ChemSet™ EPCON™ G5 Xtrem™

STRENGTH LIMIT STATE DESIGN

AVAILABLE IN NEW ZEALAND ONLY

Seismic Anchors - ChemSet™ EPCON™ G5 Xtrem™ - Anchor Studs

STEP 2 Verify Seismic C1 & C2 cracked concrete tensile capacity - per anchor

Table 2a - Seismic C1 & C2 Cracked concrete combined Pull-out and concrete cone resistance, tension

$$N_{Rd,p,seis}^0 = \alpha_{seis} N_{Rk,p,seis}^0 / \gamma_{Msp} \text{ (kN)}, \alpha_{N,seis} = 0.85, \gamma_{Msp} = 1.5, f'c = 30 \text{ MPa where } N_{Rk,p,seis}^0 = \pi * d_b * h * \tau_{Rk,cr,seis}$$

| Anchor Size, d_b | C1 & C2 Seismic Data combined pull-out and concrete cone resistance $N_{Rd,p,seis}^0$ | | | | | | | | | | | | Concrete Cone Resistance - $N_{Rd,c,seis}^0$ |
|------------------------------|---|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|-------------|--|
| | M10 | | M12 | | M16 | | M20 | | M24 | | M30 | | |
| | 12 | | 14 | | 18 | | 25 | | 28 | | 35 | | |
| Drilled Hole Dia, d_h (mm) | | | | | | | | | | | | | |
| Effective Depth, h (mm) | C1 | C2 | C1 | C2 | C1 | C2 | C1 | C2 | C1 | C2 | C1 | C2 | |
| 70 | 7.7 | 5.0 | | | | | | | | | | | 12.4 |
| 80 | 8.8 | 5.7 | | | | | | | | | | | 15.1 |
| 90 | 9.9 | 6.4 | 16.5 | 10.0 | | | | | | | | | 18.0 |
| 100 | 11.0 | 7.1 | 18.4 | 11.1 | | | | | | | | | 21.1 |
| 110 | 12.1 | 7.8 | 20.2 | 12.2 | 29.1 | 12.8 | | | | | | | 24.3 |
| 120 | 13.2 | 8.5 | 22.0 | 13.3 | 31.8 | 14.0 | | | | | | | 27.7 |
| 125 | 13.8 | 8.9 | 23.0 | 13.9 | 33.1 | 14.6 | | | | | | | 29.5 |
| 140 | 15.5 | 10.0 | 25.7 | 15.6 | 37.1 | 16.3 | | | | | | | 34.9 |
| 150 | 16.6 | 10.7 | 27.6 | 16.7 | 39.7 | 17.5 | 49.1 | 20.3 | | | | | 38.7 |
| 160 | 17.7 | 11.4 | 29.4 | 17.8 | 42.4 | 18.7 | 52.4 | 21.6 | 64.9 | 19.8 | | | 42.7 |
| 170 | 18.8 | 12.1 | 31.2 | 18.9 | 45.0 | 19.9 | 55.7 | 23.0 | 69.0 | 21.1 | | | 46.7 |
| 180 | 19.9 | 12.8 | 33.1 | 20.0 | 47.7 | 21.0 | 59.0 | 24.4 | 73.1 | 22.3 | | | 50.9 |
| 190 | 21.0 | 13.5 | 34.9 | 21.1 | 50.3 | 22.2 | 62.2 | 25.7 | 77.1 | 23.5 | | | 55.2 |
| 200 | 22.1 | 14.2 | 36.7 | 22.2 | 53.0 | 23.4 | 65.5 | 27.1 | 81.2 | 24.8 | | | 59.6 |
| 210 | | | 38.6 | 23.3 | 55.6 | 24.5 | 68.8 | 28.4 | 85.2 | 26.0 | 93.1 | 53.8 | 64.2 |
| 240 | | | 44.1 | 26.7 | 63.6 | 28.0 | 78.6 | 32.5 | 97.4 | 29.7 | 106.4 | 61.5 | 78.4 |
| 280 | | | | | 74.2 | 32.7 | 91.7 | 37.9 | 113.7 | 34.7 | 124.1 | 71.8 | 98.8 |
| 320 | | | | | 84.8 | 37.4 | 104.8 | 43.3 | 129.9 | 39.6 | 141.8 | 82.0 | 120.7 |
| 350 | | | | | | | 114.6 | 47.4 | 142.1 | 43.4 | 155.1 | 89.7 | 138.1 |
| 400 | | | | | | | 131.0 | 54.1 | 162.4 | 49.6 | 177.3 | 102.5 | 168.7 |
| 450 | | | | | | | | | 182.7 | 55.8 | 199.5 | 115.4 | 201.3 |
| 480 | | | | | | | | | 194.8 | 59.5 | 212.8 | 123.0 | 221.8 |
| 550 | | | | | | | | | | | 243.8 | 141.0 | 272.0 |
| 600 | | | | | | | | | | | 266.0 | 153.8 | 309.9 |

Bold values are at ChemSet Anchors Stud nominal depths h_n

All data relevant for Dry and Wet Holes. For Flooded Holes MULTIPLY $N_{Rd,p,seis}^0 \times 0.62$ & $N_{Rd,c,seis}^0 \times 0.62$. For single anchor values: Multiply $N_{Rd,p,seis}^0 \times 1.17$ & $N_{Rd,c,seis}^0 \times 1.13$. For optimised performance data, including performance based on diamond drilling technique, please use Ramset iExpert Anchoring Software.

| |
|--|
| For C1 Seismic - Calculate $N_{Rd,p,seis}^0$, $N_{Rd,c,seis}^0$ then choose minimum - Refer to Checkpoint 2a and 2b |
| For C2 Seismic - Calculate $N_{Rd,p,seis}^0$ only then choose minimum - Refer to Checkpoint 2a only |

Table 2b-1 Seismic Cracked concrete service temperature limits effect, tension, X_{ns}

| Service temperature (°C) | Seis. Cat. | M10 | M12 | M16 | M20 | M24 | M30 |
|--------------------------|------------|------|------|------|------|------|------|
| -40 °C to +40 °C | C1 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | C2 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| -40 °C to +60 °C | C1 | 0.85 | 0.85 | 0.84 | 0.85 | 0.84 | 0.85 |
| | C2 | 0.85 | 0.85 | 0.85 | 0.84 | 0.85 | 0.83 |
| -40 °C to +75 °C | C1 | 0.26 | 0.27 | 0.26 | 0.26 | 0.26 | 0.26 |
| | C2 | 0.25 | 0.27 | 0.27 | 0.26 | 0.26 | 0.25 |

Table 2b-2 Seismic Cracked concrete compressive strength effect, tension, X_{nc}

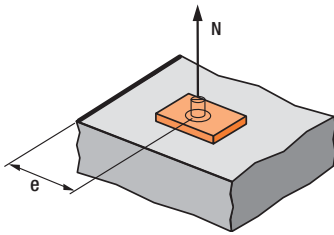
| f'c (MPa) | 20 | 25 | 30 | 40 | 50 |
|--|------|------|-----|------|------|
| X_{nc} for $N_{Rd,p,seis}^0$ (Bond) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| X_{nc} for $N_{Rd,c,seis}^0$ (Conc.) | 0.81 | 0.91 | 1.0 | 1.15 | 1.29 |

ChemSet™ EPCON™ G5 Xtrem™

STRENGTH LIMIT STATE DESIGN

AVAILABLE IN NEW ZEALAND ONLY

Seismic Anchors - ChemSet™ EPCON™ G5 Xtrem™ - Anchor Studs



$$X_{ne} = 0.25 + 0.5 \cdot (e/h)$$

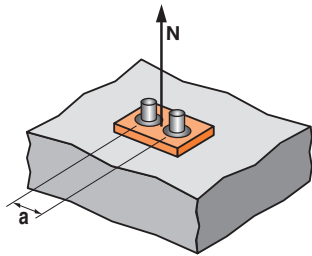
Where $e_m \leq e \leq e_c$

$$e_c = 1.5 \cdot h$$

Note: Tabled values are based on the nominal effective depth, h shown in the installation details. For other values of X_{ne} , please use equation shown above.

Table 2c - Seismic cracked concrete Edge distance effect, tension, X_{ne}

| Anchor size, db | M10 | M12 | M16 | M20 | M24 | M30 |
|------------------------------|------|------|------|------|------|------|
| Edge distance, e (mm) | | | | | | |
| 40 | 0.47 | 0.43 | | | | |
| 45 | 0.50 | 0.45 | 0.43 | | | |
| 50 | 0.53 | 0.48 | 0.45 | | | |
| 55 | 0.56 | 0.50 | 0.47 | 0.41 | | |
| 60 | 0.58 | 0.52 | 0.49 | 0.43 | 0.39 | |
| 65 | 0.61 | 0.55 | 0.51 | 0.44 | 0.40 | |
| 70 | 0.64 | 0.57 | 0.53 | 0.46 | 0.42 | |
| 90 | 0.75 | 0.66 | 0.61 | 0.51 | 0.46 | 0.41 |
| 100 | 0.81 | 0.70 | 0.65 | 0.54 | 0.49 | 0.43 |
| 115 | 0.89 | 0.77 | 0.71 | 0.59 | 0.52 | 0.46 |
| 135 | 1.00 | 0.86 | 0.79 | 0.65 | 0.57 | 0.49 |
| 165 | | 1.00 | 0.91 | 0.74 | 0.64 | 0.54 |
| 187 | | | 1.00 | 0.80 | 0.70 | 0.58 |
| 255 | | | | 1.00 | 0.86 | 0.71 |
| 315 | | | | | 1.00 | 0.81 |
| 420 | | | | | | 1.00 |



$$X_{na} = 0.5 + a/(6 \cdot h)$$

Where $a_m \leq a \leq a_c$

$$a_c = 3 \cdot h$$

Note: Tabled values are based on the nominal effective depth, h shown in the installation details. For other values X_{na} , please use equation shown above.

Table 2d - Seismic cracked concrete anchor spacing effect, tension, X_{na}

| Anchor size, d _b | M10 | M12 | M16 | M20 | M24 | M30 |
|-------------------------------|------|------|------|------|------|------|
| Anchor spacing, a (mm) | | | | | | |
| 40 | 0.57 | | | | | |
| 45 | 0.58 | | | | | |
| 50 | 0.59 | 0.58 | | | | |
| 55 | 0.60 | 0.58 | | | | |
| 60 | 0.61 | 0.59 | | | | |
| 70 | 0.63 | 0.61 | 0.59 | | | |
| 80 | 0.66 | 0.63 | 0.61 | 0.58 | | |
| 90 | 0.67 | 0.64 | 0.62 | 0.59 | 0.57 | |
| 140 | 0.76 | 0.71 | 0.69 | 0.64 | 0.61 | 0.58 |
| 170 | 0.81 | 0.76 | 0.73 | 0.67 | 0.63 | 0.60 |
| 200 | 0.87 | 0.80 | 0.77 | 0.70 | 0.66 | 0.62 |
| 270 | 1.00 | 0.91 | 0.86 | 0.76 | 0.71 | 0.66 |
| 330 | | 1.00 | 0.94 | 0.82 | 0.76 | 0.70 |
| 375 | | | 1.00 | 0.87 | 0.80 | 0.72 |
| 510 | | | | 1.00 | 0.90 | 0.80 |
| 630 | | | | | 1.00 | 0.88 |
| 840 | | | | | | 1.00 |

Checkpoint 2a

Design seismic cracked concrete combined pull-out and concrete cone resistance, $N_{Rd,p,seis}$

$$N_{Rd,p,seis} = N_{Rd,p,seis}^0 \cdot X_{ns} \cdot X_{nc} \cdot X_{ne} \cdot X_{na}$$

Checkpoint 2b

Design seismic cracked concrete combined pull-out and concrete cone resistance, $N_{Rd,c,seis}$

$$N_{Rd,c,seis} = N_{Rd,c,seis}^0 \cdot X_{ns} \cdot X_{nc} \cdot X_{ne} \cdot X_{na}$$

STEP 3

Verify seismic C1 & C2 cracked concrete tensile resistance - per anchor

Table 3a - Seismic (C1 & C2) Cracked Concrete steel resistance, tensile, $N_{Rd,s,seis} = \alpha_{seis} \cdot N_{Rk,s,seis} / \gamma_{Ms}$ (kN), $\alpha_{seis} = 1.0$

$\gamma_{Ms} = 1.5$ for Grade 5.8 and Grade 8.8 Carbon Steel

$\gamma_{Ms} = 1.87$ for A4 316 Stainless Steel

$\gamma_{Ms} = 1.5$ for HCR 1.4529 Stainless Steel

| Anchor size, d _b | M10 | M12 | M16 | M20 | M24 | M30 |
|-----------------------------|------|------|------|-------|-------|-------|
| Grade 5.8 Carbon Steel | 19.3 | 28.1 | 52.3 | 81.7 | 117.7 | 187.0 |
| Grade 8.8 Carbon Steel | 30.9 | 44.9 | 83.7 | 130.7 | 188.3 | 299.2 |
| A4 316 Stainless Steel | 21.7 | 31.6 | 58.8 | 91.7 | 132.1 | 210.0 |
| HCR 1.4529 Stainless Steel | 27.1 | 39.3 | 73.3 | 114.3 | 164.7 | 261.8 |

Checkpoint 3

Design seismic C1 & C2 cracked concrete tensile resistance, $N_{Rd,seis}$

$$N_{Rd,seis} = \text{minimum of } N_{Rd,p,seis}, N_{Rd,c,seis}, N_{Rd,s,seis}$$

Check $N^*/N_{Rd,seis} \leq 1$,

if not satisfied return to step 1

ChemSet™ EPCON™ G5 Xtrem™

STRENGTH LIMIT STATE DESIGN

AVAILABLE IN NEW ZEALAND ONLY

Seismic Anchors - ChemSet™ EPCON™ G5 Xtrem™ - Anchor Studs

STEP 4

Step 4 - Verify seismic C1 & C2 cracked concrete edge shear resistance - per anchor

Table 4a - Seismic C1 & C2 cracked concrete edge resistance, $V_{Rd,c,seis}^0 = \alpha_{seis} V_{Rk,c,seis}^0 / \gamma_{Mc}$ (kN), $\gamma_{Mc} = 1.5$, $\alpha_{seis} = 0.85$, $f'_c = 30$ MPa

| Anchor size, d_b | M10 | M12 | M16 | M20 | M24 | M30 |
|-------------------------|-----|-----|-----|-----|-----|-----|
| Effective depth, h (mm) | 90 | 110 | 125 | 170 | 210 | 280 |
| Edge distance, e_m | | | | | | |
| 40 | 1.3 | 1.5 | | | | |
| 45 | | | 1.9 | | | |
| 55 | | | | 2.8 | | |
| 60 | | | | | 3.5 | |
| 90 | | | | | | 6.5 |

Note: Data includes annular gap reduction factor of 0.5. If annular gap is filled multiply $V_{Rd,c,seis}^0 * 2$
 For single anchor values: Multiply $V_{Rd,c,seis}^0 * 1.17$

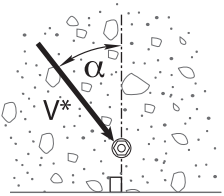
For optimised performance data, please use Ramset iExpert Anchoring Software.

Table 4b - Seismic cracked concrete compressive strength effect, shear, X_{vc}

| f'_c (MPa) | 20 | 25 | 30 | 40 | 50 |
|--------------|------|------|------|------|------|
| X_{vc} | 0.82 | 0.91 | 1.00 | 1.15 | 1.29 |

Table 4c - Seismic cracked concrete load direction effect, concrete edge shear, X_{vd}

| Angle, α° | 0-55 | 60 | 70 | 80 | 90-180 |
|-----------------------|------|-----|-----|-----|--------|
| X_{vd} | 1 | 1.1 | 1.2 | 1.5 | 2 |



Load direction effect, conc. edge shear, X_{vd}

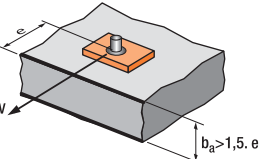
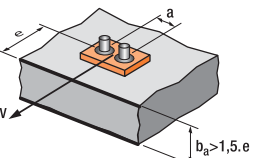


Table 4d - Seismic cracked concrete anchor spacing and edge distance effect, concrete edge shear, X_{ve}

For single anchor fastening X_{ve}

| e/e_m | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 | 2.2 | 2.4 | 2.6 | 2.8 | 3.0 | 3.2 |
|----------|------|------|------|------|------|------|------|------|------|------|------|------|
| X_{ve} | 1.00 | 1.31 | 1.66 | 2.02 | 2.41 | 2.83 | 3.26 | 3.72 | 4.19 | 4.69 | 5.20 | 5.72 |

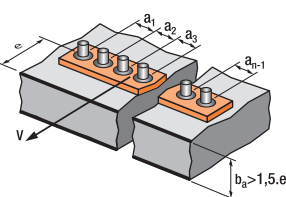
$$X_{ve} = e/e_m * \sqrt{e/e_m}$$



For 2 anchors fastening X_{ve}

| e/e_m | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 | 2.2 | 2.4 | 2.6 | 2.8 | 3.0 | 3.2 |
|---------|------|------|------|------|------|------|------|------|------|------|------|------|
| a/e_m | | | | | | | | | | | | |
| 1.0 | 0.67 | 0.84 | 1.03 | 1.22 | 1.43 | 1.65 | 1.88 | 2.12 | 2.36 | 2.62 | 2.89 | 3.16 |
| 1.5 | 0.75 | 0.93 | 1.12 | 1.33 | 1.54 | 1.77 | 2.00 | 2.25 | 2.50 | 2.76 | 3.03 | 3.31 |
| 2.0 | 0.83 | 1.02 | 1.22 | 1.43 | 1.65 | 1.89 | 2.12 | 2.38 | 2.63 | 2.90 | 3.18 | 3.46 |
| 2.5 | 0.92 | 1.11 | 1.32 | 1.54 | 1.77 | 2.00 | 2.25 | 2.50 | 2.77 | 3.04 | 3.32 | 3.61 |
| 3.0 | 1.00 | 1.20 | 1.42 | 1.64 | 1.88 | 2.12 | 2.37 | 2.63 | 2.90 | 3.18 | 3.46 | 3.76 |
| 3.5 | | 1.30 | 1.52 | 1.75 | 1.99 | 2.24 | 2.50 | 2.76 | 3.04 | 3.32 | 3.61 | 3.91 |
| 4.0 | | | 1.62 | 1.86 | 2.10 | 2.36 | 2.62 | 2.89 | 3.17 | 3.46 | 3.75 | 4.05 |
| 4.5 | | | | 1.96 | 2.21 | 2.47 | 2.74 | 3.02 | 3.31 | 3.60 | 3.90 | 4.20 |
| 5.0 | | | | | 2.33 | 2.59 | 2.87 | 3.15 | 3.44 | 3.74 | 4.04 | 4.35 |
| 5.5 | | | | | | 2.71 | 2.99 | 3.28 | 3.71 | 4.02 | 4.33 | 4.65 |
| 6.0 | | | | | | 2.83 | 3.11 | 3.41 | 3.71 | 4.02 | 4.33 | 4.65 |

$$X_{ve} = \frac{3 * e + a}{6 * e_m} * \sqrt{e/e_m}$$



For 3 anchors fastening and more

$$X_{ve} = \frac{3 * e + a_1 + a_2 + a_3 + \dots + a_{n-1}}{3 * n * e_m} * \sqrt{e/e_m}$$

ChemSet™ EPCON™ G5 Xtrem™

STRENGTH LIMIT STATE DESIGN

AVAILABLE IN NEW ZEALAND ONLY

Seismic Anchors - ChemSet™ EPCON™ G5 Xtrem™ - Anchor Studs

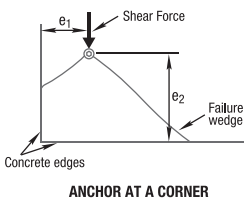
Table 4e - Seismic C1 & C2 Cracked concrete Pryout failure, $V_{Rd,cp,seis}^0 = \alpha_{seis} V_{Rk,cp} / \gamma_{Mpr}$ (kN), $\gamma_{Mpr} = 1.5$, $\alpha_{seis} = 0.75$, $f'_c = 30$ MPa

| Anchor size, d_b | | M10 | M12 | M16 | M20 | M24 | M30 |
|-------------------------|-----------------|-----|------|------|------|------|------|
| Effective depth, h (mm) | | 90 | 110 | 125 | 170 | 210 | 280 |
| -40°C to +40°C | C1 Seismic Data | 8.8 | 17.8 | 29.2 | 46.7 | 64.2 | 98.8 |
| | C2 Seismic Data | 5.7 | 10.8 | 12.9 | 20.3 | 23.0 | 63.3 |
| -40°C to +60°C | C1 Seismic Data | 7.5 | 15.1 | 24.5 | 39.6 | 54.0 | 83.9 |
| | C2 Seismic Data | 4.8 | 9.1 | 11.0 | 17.1 | 19.6 | 52.8 |
| -40°C to +75°C | C1 Seismic Data | 2.3 | 4.8 | 7.5 | 12.2 | 16.6 | 25.7 |
| | C2 Seismic Data | 1.4 | 2.9 | 3.5 | 5.3 | 6.0 | 15.8 |

Note: Data includes annular gap reduction factor of 0.5 For single anchor values: Multiply $V_{Rd,cp,seis}^0$ *1.13
If annular gap is filled multiply $V_{Rd,cp,seis}$ *2

Table 4f Anchor at a corner effect, concrete edge shear, X_{VS}

Note: For $e_1/e_2 > 1.25$, $X_{VS} = 1.0$



| Edge distance, e_2 (mm) | 25 | 30 | 35 | 50 | 60 | 75 | 125 | 200 | 300 | 400 | 600 | 900 |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| 25 | 0.86 | 0.77 | 0.70 | 0.58 | 0.53 | 0.49 | 0.41 | 0.37 | 0.35 | 0.34 | 0.32 | 0.32 |
| 30 | 0.97 | 0.86 | 0.78 | 0.64 | 0.58 | 0.52 | 0.43 | 0.38 | 0.36 | 0.34 | 0.33 | 0.32 |
| 35 | 1.00 | 0.95 | 0.86 | 0.69 | 0.63 | 0.56 | 0.46 | 0.40 | 0.37 | 0.35 | 0.33 | 0.32 |
| 50 | 1.00 | 1.00 | 1.00 | 0.86 | 0.77 | 0.67 | 0.52 | 0.44 | 0.39 | 0.37 | 0.35 | 0.33 |
| 60 | 1.00 | 1.00 | 1.00 | 0.97 | 0.86 | 0.75 | 0.57 | 0.47 | 0.41 | 0.38 | 0.36 | 0.34 |
| 75 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.86 | 0.64 | 0.51 | 0.44 | 0.41 | 0.37 | 0.35 |
| 125 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.86 | 0.65 | 0.53 | 0.48 | 0.42 | 0.38 |
| 200 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.86 | 0.67 | 0.58 | 0.49 | 0.42 |
| 300 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.86 | 0.72 | 0.58 | 0.49 |
| 400 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.86 | 0.67 | 0.55 |
| 500 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.77 | 0.61 |
| 600 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.86 | 0.67 |
| 900 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.86 |

Checkpoint 4a

Design seismic cracked concrete edge shear resistance, $V_{Rd,c,seis}$

$$= V_{Rd,c,seis}^0 * X_{vc} * X_{vd} * X_{ve} * X_{vs}$$

Checkpoint 4b

Design seismic cracked concrete Pryout failure,

$$V_{Rd,cp,seis} = V_{Rd,cp,seis}^0 * X_{nc} * X_{ne} * X_{na}$$

STEP 5

Verify seismic C1 & C2 cracked concrete shear resistance - per anchor

Table 5a - Seismic C1 & C2 Cracked Concrete steel shear resistance, $V_{Rd,s,seis} = \alpha_{seis} V_{Rk,s,seis} / \gamma_{Ms}$ (kN), $\alpha_{seis} = 0.85$

$\gamma_{Ms} = 1.25$ for Grade 5.8 and Grade 8.8 Carbon Steel

$\gamma_{Ms} = 1.56$ for A4 316 Stainless Steel

| Anchor size, d_b | M10 | | M12 | | M16 | | M20 | | M24 | | M30 | |
|----------------------------|-----|-----|-----|-----|------|------|------|------|------|------|------|------|
| | C1 | C2 | C1 | C2 | C1 | C2 | C1 | C2 | C1 | C2 | C1 | C2 |
| Grade 5.8 Carbon Steel | 3.5 | 3.9 | 6.0 | 6.1 | 10.9 | 10.7 | 17.1 | 16.7 | 18.9 | 17.8 | 30.1 | 30.1 |
| Grade 8.8 Carbon Steel | 5.5 | 6.3 | 9.6 | 9.8 | 17.5 | 17.1 | 27.3 | 26.7 | 30.3 | 28.5 | 48.1 | 45.8 |
| A4 316 Stainless Steel | 3.9 | 4.4 | 6.8 | 6.8 | 12.3 | 12.0 | 19.2 | 18.7 | 21.2 | 20.0 | 33.7 | 32.1 |
| HCR 1.4529 Stainless Steel | 4.8 | 5.5 | 8.4 | 8.5 | 15.3 | 15.0 | 23.9 | 23.4 | 26.5 | 25.0 | 42.1 | 40.1 |

Note: Data includes annular gap reduction factor of 0.5 If annular gap is filled multiply $V_{Rd,s,seis}$ *2
For single anchor values: Multiply $V_{Rd,s,seis}$ *1.17

Checkpoint 5

Design seismic C1 & C2 cracked concrete shear resistance, $V_{Rd,seis}$

$$V_{Rd,seis} = \text{minimum of } V_{Rd,c,seis}, V_{Rd,cp,seis}, V_{Rd,s,seis}$$

Check $V/V_{Rd,seis} \leq 1$,
if not satisfied return to step 1

ChemSet™ EPCON™ G5 Xtrem™

STRENGTH LIMIT STATE DESIGN

AVAILABLE IN NEW ZEALAND ONLY

Seismic Anchors - ChemSet™ EPCON™ G5 Xtrem™ - Anchor Studs

STEP 6 Combined Loading

Checkpoint 6

Check

$$N^*/N_{Rd,seis} + V^*/V_{Rd,seis} \leq 1.0,$$

if not satisfied return to step 1

Specify - Threaded Stud Anchors
 Ramset™ EPCON™ G5 Xtrem™ with (Anchor Size) grade 5.8 ChemSet™ Anchor Stud (Anchor Stud Part Number) Drilled Hole Depth to be (h) mm.

Example
 Ramset™ EPCON™ G5 Xtrem™ Injection with M16 grade 5.8 ChemSet™ Anchor Stud (CS16190GH). Drilled hole depth to be 125mm. To be installed according to Ramset™ Installation Instructions.

Use Ramset™ iExpert Anchor Software for optimised calculation or where a greater range of anchor layout detail is needed.

ChemSet™ EPCON™ G5 Xtrem™

SEISMIC REINFORCING BAR - CHEMICAL INJECTION

AVAILABLE IN NEW ZEALAND ONLY

(Australia refer to ChemSet™ Reo502™ Xtrem™ range)

GENERAL INFORMATION

| Performance Related | Installation Related |
|---------------------|----------------------|
| | |

Product

Chemset™ EPCON™ G5 Xtrem™ is a heavy duty pure Epoxy for anchoring threaded studs and reinforcing bar into cracked and uncracked concrete.



Compliance

European Technical Assessment - ETA-25/0647

Design according to:

- CONCRETE NZ Technical Specification 02:2025
- NZS 3101
- EN 1992-1-1
- Use enclosed data for simplified calculation method

Use Ramset™ iExpert Anchor Software for optimised calculation or where a greater range of anchor layout detail is needed.

Benefits, Advantages and Features

- 100 year working Life

Greater productivity:

- Anchors in dry, damp, wet or flooded holes
- Easy dispensing even in cold weather

Greater security:

- Strong bond
- Rated for sustained loading

Versatile:

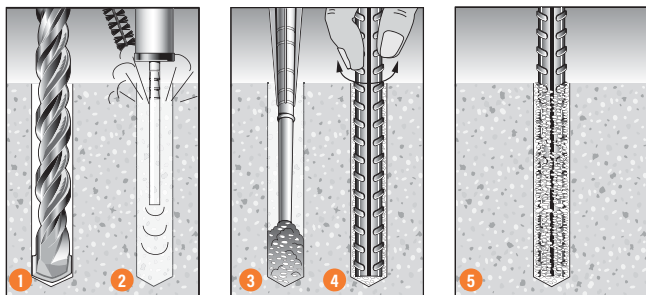
- Anchors in carbide drilled and diamond drilled holes
- Cold and temperate climates

Greater safety:

- Low odour
- VOC Compliant
- Suitable for contact with drinking water

Fire Rated : Refer Fire rated anchoring section

Installation



Important:

1. Drill recommended diameter and depth hole.
2. **Important:** For hammer drilling technique clean dust and debris from hole with stiff wire brush and blower in the following sequence: blow x 2, brush x 2, blow x 2, brush x 2, blow x 2. For diamond drilling technique refer to ETA-25/0647.
3. Screw mixing nozzle onto cartridge and dispense adhesive to waste until colour is orange. Insert mixing nozzle to bottom of hole. Fill hole to 2/3 the hole depth slowly, ensuring no air pockets form.
4. Insert Ramset™ ChemSet™ Anchor Stud/rebar to bottom of hole while turning.
5. Allow Chemset™ EPCON™ G5 Xtrem™ to cure as per setting times.



Principal Applications

- Threaded Studs
- Starter Bars
- Threaded Inserts
- Over-head installation
- Steel Columns
- Hand Rails
- Road Stitching

Recommended Installation Temperatures

| | Minimum | Maximum |
|-----------|---------|---------|
| Substrate | 5°C | 40°C |
| Adhesive | 5°C | 40°C |

Service Temperature Limits

-40°C to +75°C

Setting Times

| Temperature of base material | Gel Time | Curing time in dry concrete | Curing time in wet and flooded concrete |
|------------------------------|----------|-----------------------------|---|
| 5°C | 75 min | 30h | 60 h |
| 10°C | 45 min | 22h | 44 h |
| 15°C | 35 min | 14h | 28 h |
| 20°C | 22 min | 7h | 14 h |
| 25°C | 14 min | 5h | 10 h |
| 30°C | 8 min | 4h | 8 h |
| 35°C | 6 min | 3h | 6h |
| 40°C | 4 min | 2h 45min | 5h 30min |

Seismic Anchors - EPCON™ G5 Xtrem™ - Reinforcing Bar

ChemSet™ EPCON™ G5 Xtrem™

STRENGTH LIMIT STATE DESIGN

AVAILABLE IN NEW ZEALAND ONLY

Installation and seismic performance details:

| Anchor size, db (mm) | Drilled hole diameter, d _h (mm) | Min. Anchor Spacing (mm) | * Min. Cover with drilling aid (mm) | ** Min. Cover without drilling aid (mm) | Nominal Yield Gr500 Rebar (kN) | Development length required to reach Nominal Yield strength in tension L _{sy,t} (mm) | | |
|----------------------|--|--------------------------|-------------------------------------|---|--------------------------------|---|--------|--------|
| | | | | | | Concrete Compressive Strength, f'c | | |
| | | | | | | 20 MPa | 25 MPa | 30 MPa |
| 10 | 12 | 50 | 41 | 63 | 39.3 | 462 | 394## | 354## |
| 12 | 15 | 60 | 43 | 69 | 56.5 | 554 | 472 | 425## |
| 16 | 20 | 80 | 47 | 82 | 100.5 | 739 | 630 | 567 |
| 20 | 25 | 100 | 52 | 95 | 157.1 | 924 | 787 | 708# |
| 25 | 30 | 125 | 67 | 122 | 245.4 | 1155 | 984 | 885 |
| 28 | 35 | 140 | 70 | 131 | 307.9 | 1293 | 1102 | 992 |
| 32 | 40 | 160 | 75 | 144 | 402.1 | 1478 | 1259 | 1133 |
| 40 | 50 | 200 | 83 | 170 | 628.3 | 1848 | 1574 | 1417 |

Note: Development length required is based on service temperature limits -40°C to +75°C.

*Note: Drill aid requirement for both Diamond core and Hammer drilling methods are stipulated in the European Technical Assessment - ETA-25/0647.

**Note: When there is no drilling aid only the Hammer drilling method can be used.

Development length data (L_{sy,t}) is applicable for both Hammer drilling and Diamond drilling technique except where noted by # and ##.

Note: For diamond drilling MULTIPLY L_{sy,t} *1.11.

Note: For diamond drilling the minimum development length is 450mm.

Drilled hole depth, h₁ (mm)
h₁ = L_{sy,t}

DESCRIPTION AND PART NUMBERS

| Description | Cartridge Size | Part No. |
|---------------------------|----------------|----------|
| ChemSet™ EPCON™ G5 Xtrem™ | 600 ml | CEG5X600 |

ENGINEERING PROPERTIES

Typical Engineering Properties of Grade 500 Reinforcing Bar

| Rebar Size | 10 | 12 | 16 | 20 | 25 | 28 | 32 | 40 |
|--|------|------|-------|-------|-------|-------|-------|-------|
| Drilled Hole Dia, d _h (mm) | 12 | 15 | 20 | 25 | 30 | 35 | 40 | 50 |
| Stress Area, A _s (mm ²) | 78.5 | 113 | 201 | 314 | 491 | 616 | 804 | 1260 |
| Yield Stress, f _{sy} (MPa) | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 |
| Tensile Steel Yield Capacity, N _{sy} (kN) | 39.3 | 56.5 | 100.5 | 157.0 | 245.5 | 308.0 | 402.0 | 628.0 |

For further information refer to reinforcing bar manufacturer's published information and current revision of AS/NZS 4671

Chemset™ EPCON™ G5 Xtrem™

FIRE RATED CHEMICAL ANCHOR

AVAILABLE IN NEW ZEALAND ONLY

(Australia refer to ChemSet™ Reo502™ Xtrem™ range)

GENERAL INFORMATION

| Performance Related | Installation Related |
|---------------------|----------------------|
|---------------------|----------------------|



Product

ChemSet™ EPCON™ G5 Xtrem™ is a heavy duty pure Epoxy for anchoring threaded studs and reinforcing bar into cracked and uncracked concrete.



Compliance

European Technical Assessment - ETA-25/0647 and ETA-25/1142

Design according to:

- AS 5216 (formerly TS101)
- EN 1992-4 (formerly ETAG001 Annex C, E & TR045)
- Fire Design according to EN 1992-1-1 and EN 1992-1-2.
- Use enclosed data for simplified calculation method

Use Ramset™ iExpert Anchor Software for optimised calculation or where a greater range of anchor layout detail is needed

Benefits, Advantages and Features

- 120 year working Life
- Fire tested to European Assessment Document

Greater productivity:

- Anchors in dry, damp, wet or flooded holes
- Easy dispensing even in cold weather

Greater security:

- Strong bond
- Rated for sustained loading

Versatile:

- Anchors in carbide drilled and diamond drilled holes
- Cold and temperate climates

Greater safety:

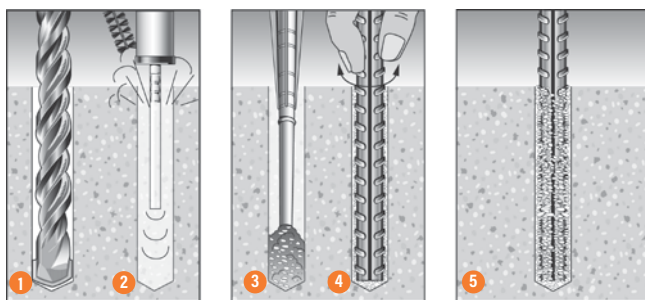
- Low odour
- VOC Compliant
- Suitable for contact with drinking water



Principal Applications

- Threaded Studs
- Starter Bars
- Threaded Inserts
- Over-head installation
- Steel Columns
- Hand Rails
- Road Stitching

Installation



- Drill recommended diameter and depth hole.
- Important:** For hammer drilling technique clean dust and debris from hole with wire brush and blower in the following sequence: blow x 2, brush x 2, blow x 2, brush x 2, blow x 2.
- Screw mixing nozzle onto cartridge and dispense adhesive to waste until colour is orange. Insert mixing nozzle to bottom of hole. Fill hole to 2/3 the hole depth slowly, ensuring no air pockets form.
- Insert Ramset™ ChemSet™ Anchor Stud/rebar to bottom of hole while turning.
- Allow Chemset™ EPCON™ G5 Xtrem™ to cure as per setting times.

Recommended Installation Temperatures

| | Minimum | Maximum |
|-----------|---------|---------|
| Substrate | 5°C | 40°C |
| Adhesive | 5°C | 40°C |

Service Temperature Limits

| |
|----------------|
| -40°C to +75°C |
|----------------|

Setting Times

| Temperature of base material | Gel Time | Curing time in dry concrete | Curing time in wet and flooded concrete |
|------------------------------|----------|-----------------------------|---|
| 5°C | 75 min | 30h | 60 h |
| 10°C | 45 min | 22h | 44 h |
| 15°C | 35 min | 14h | 28 h |
| 20°C | 22 min | 7h | 14 h |
| 25°C | 14 min | 5h | 10 h |
| 30°C | 8 min | 4h | 8 h |
| 35°C | 6 min | 3h | 6h |
| 40°C | 4 min | 2h 45min | 5h 30min |

Fire Rated Anchoring Systems

ChemSet™ EPCON™ G5 Xtrem™

FIRE RATED CHEMICAL ANCHOR

AVAILABLE IN NEW ZEALAND ONLY

Installation Details

ChemSet™ EPCON™ G5 Xtrem™ with Reinforcing Bar

| Anchor size, d_b (mm) | Drilled hole diameter, d_h (mm) |
|-------------------------|-----------------------------------|
| 10 | 12 |
| 12 | 15 |
| 16 | 20 |
| 20 | 25 |
| 24 | 30 |
| 25 | 30 |
| 28 | 35 |
| 32 | 40 |
| 36 | 45 |
| 40 | 50 |

DESCRIPTION AND PART NUMBERS

| Description | Cartridge Size | Part No. |
|---------------------------|----------------|----------|
| ChemSet™ EPCON™ G5 Xtrem™ | 600 ml | CEG5X600 |

ENGINEERING PROPERTIES

Typical Engineering Properties of Grade 500 Reinforcing Bar

| Rebar size | 10 | 12 | 16 | 20 | 24 | 25 | 28 | 32 | 36 | 40 |
|---|------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Drilled hole dia, d_h (mm) | 12 | 15 | 20 | 25 | 30 | 30 | 35 | 40 | 45 | 50 |
| Stress area, A_s (mm ²) | 78.5 | 113 | 201 | 314 | 452 | 491 | 616 | 804 | 1020 | 1260 |
| Yield stress, f_{sy} (MPa) | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 |
| Tensile steel yield capacity, $N_{us} = N_{syr}$ (kN) | 39.3 | 56.5 | 100.5 | 157.0 | 226.0 | 245.5 | 308.0 | 402.0 | 509.0 | 628.0 |
| Design tensile steel resistance ϕN_{us} (kN) | 31.4 | 45.2 | 80.4 | 125.6 | 180.8 | 196.4 | 246.4 | 321.6 | 407.2 | 502.4 |

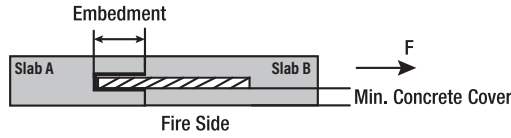
For further information refer to reinforcing bar manufacturer's published information and current revision of **AS/NZS 4671**

Chemset™ EPCON™ G5 Xtrem™

FIRE RATED CHEMICAL ANCHOR

AVAILABLE IN NEW ZEALAND ONLY

Reinforcing Bar Anchored with ChemSet™ EPCON™ G5 Xtrem™



Design Case **1**

Fire resistance duration = 30 minutes

For Reinforcing Bar Steel Grade - 500 MPa and Concrete cylinder compressive strength $f'_c = 20$ MPa

| Rebar Size | Hole Diameter (mm) | *Min. Concrete Cover(mm) | **Design resistance in accordance with Eurocode 2 for fire duration 30 minutes - $R_{d,fi}$ (kN) | | | | | | | | | | | | | | | |
|----------------|--------------------|--------------------------|--|-------|-------|-------|-------|--------|--------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|--|--|
| | | | 3.32 | 4.98 | 6.64 | 8.30 | 9.96 | 11.62 | 13.28 | 14.94 | 16.59 | 18.25 | 19.91 | 23.23 | 26.55 | 29.87 | | |
| 10 | 12 | 50 | 3.32 | 4.98 | 6.64 | 8.30 | 9.96 | 11.62 | 13.28 | 14.94 | 16.59 | 18.25 | 19.91 | 23.23 | 26.55 | 29.87 | | |
| | | 70 | 7.63 | 11.45 | 15.26 | 19.08 | 22.89 | 26.71 | 30.52 | 31.42 | 31.42 | 31.42 | 31.42 | 31.42 | 31.42 | 31.42 | | |
| 12 | 15 | 50 | 3.98 | 5.97 | 7.97 | 9.96 | 11.95 | 13.94 | 15.93 | 17.92 | 19.91 | 21.91 | 23.90 | 27.88 | 31.86 | 35.84 | | |
| | | 70 | 9.16 | 13.73 | 18.31 | 22.89 | 27.47 | 32.05 | 36.63 | 41.20 | 45.24 | 45.24 | 45.24 | 45.24 | 45.24 | 45.24 | | |
| 16 | 20 | 50 | | 7.97 | 10.62 | 13.28 | 15.93 | 18.59 | 21.24 | 23.90 | 26.55 | 29.21 | 31.86 | 37.17 | 42.48 | 47.79 | | |
| | | 70 | | 18.31 | 24.42 | 30.52 | 36.63 | 42.73 | 48.83 | 54.94 | 61.04 | 67.15 | 73.25 | 80.42 | 80.42 | 80.42 | | |
| 20 | 25 | 50 | | | 13.28 | 16.59 | 19.91 | 23.23 | 26.55 | 29.87 | 33.19 | 36.51 | 39.83 | 46.47 | 53.10 | 59.74 | | |
| | | 70 | | | 30.52 | 38.15 | 45.78 | 53.41 | 61.04 | 68.67 | 76.30 | 83.93 | 91.56 | 106.83 | 122.09 | 125.66 | | |
| 24 | 30 | 50 | | | | 19.91 | 23.90 | 27.88 | 31.86 | 35.84 | 39.83 | 43.81 | 47.79 | 55.76 | 63.72 | 71.69 | | |
| | | 70 | | | | 45.78 | 54.94 | 64.10 | 73.25 | 82.41 | 91.56 | 100.72 | 109.88 | 128.19 | 146.50 | 164.82 | | |
| 25 | 30 | 50 | | | | 20.74 | 24.89 | 29.04 | 33.19 | 37.34 | 41.49 | 45.64 | 49.78 | 58.08 | 66.38 | 74.68 | | |
| | | 70 | | | | 47.69 | 57.23 | 66.77 | 76.30 | 85.84 | 95.38 | 104.92 | 114.46 | 133.53 | 152.61 | 171.68 | | |
| 28 | 35 | 50 | | | | | 27.88 | 32.53 | 37.17 | 41.82 | 46.47 | 51.11 | 55.76 | 65.05 | 74.34 | 83.64 | | |
| | | 70 | | | | | 64.10 | 74.78 | 85.46 | 96.14 | 106.83 | 117.51 | 128.19 | 149.56 | 170.92 | 192.29 | | |
| 32 | 40 | 50 | | | | | | 37.17 | 42.48 | 47.79 | 53.10 | 58.41 | 63.72 | 74.34 | 84.97 | 95.59 | | |
| | | 70 | | | | | | 85.46 | 97.67 | 109.88 | 122.09 | 134.30 | 146.50 | 170.92 | 195.34 | 219.76 | | |
| 36 | 45 | 50 | | | | | | 41.82 | 47.79 | 53.77 | 59.74 | 65.72 | 71.69 | 83.64 | 95.59 | 107.53 | | |
| | | 70 | | | | | | 96.14 | 109.88 | 123.61 | 137.35 | 151.08 | 164.82 | 192.29 | 219.76 | 247.23 | | |
| 40 | 50 | 50 | | | | | | 46.47 | 53.10 | 59.74 | 66.38 | 73.02 | 79.66 | 92.93 | 106.21 | 119.48 | | |
| | | 70 | | | | | | 106.83 | 122.09 | 137.35 | 152.61 | 167.87 | 183.13 | 213.65 | 244.17 | 274.69 | | |
| Embedment (mm) | | | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 700 | 800 | 900 | | |

*Note: Minimum concrete cover based on minimum slab thickness of 200mm according to Eurocode 2 Part 1.2 (EN 1992-1-2)

**Note: Performance data based on hammer drilling technique. For data using core drilling technique, please refer to Ramset Engineer.

Bold values depicts design tensile steel resistance governs.

Design Case **2**

Fire resistance duration = 60 minutes

For Reinforcing Bar Steel Grade - 500 MPa and Concrete cylinder compressive strength $f'_c = 20$ MPa

| Rebar Size | Hole Diameter (mm) | *Min. Concrete Cover(mm) | **Design resistance in accordance with Eurocode 2 for fire duration 60 minutes - $R_{d,fi}$ (kN) | | | | | | | | | | | | | | | |
|----------------|--------------------|--------------------------|--|-------|-------|-------|-------|-------|--------|--------|--------------|--------------|--------------|--------------|--------------|--------------|--|--|
| | | | 3.64 | 5.47 | 7.29 | 9.11 | 10.93 | 12.76 | 14.58 | 16.40 | 18.22 | 20.04 | 21.87 | 25.51 | 29.15 | 31.42 | | |
| 10 | 12 | 80 | 3.64 | 5.47 | 7.29 | 9.11 | 10.93 | 12.76 | 14.58 | 16.40 | 18.22 | 20.04 | 21.87 | 25.51 | 29.15 | 31.42 | | |
| | | 100 | 6.60 | 9.91 | 13.21 | 16.51 | 19.81 | 23.12 | 26.42 | 29.72 | 31.42 | 31.42 | 31.42 | 31.42 | 31.42 | 31.42 | | |
| 12 | 15 | 80 | 4.37 | 6.56 | 8.75 | 10.93 | 13.12 | 15.31 | 17.49 | 19.68 | 21.87 | 24.05 | 26.24 | 30.61 | 34.99 | 39.36 | | |
| | | 100 | 7.93 | 11.89 | 15.85 | 19.81 | 23.78 | 27.74 | 31.70 | 35.67 | 39.63 | 43.59 | 45.24 | 45.24 | 45.24 | 45.24 | | |
| 16 | 20 | 80 | | 8.75 | 11.66 | 14.58 | 17.49 | 20.41 | 23.32 | 26.24 | 29.15 | 32.07 | 34.99 | 40.82 | 46.65 | 52.48 | | |
| | | 100 | | 15.85 | 21.13 | 26.42 | 31.70 | 36.99 | 42.27 | 47.55 | 52.84 | 58.12 | 63.40 | 73.97 | 80.42 | 80.42 | | |
| 20 | 25 | 80 | | | 14.58 | 18.22 | 21.87 | 25.51 | 29.15 | 32.80 | 36.44 | 40.09 | 43.73 | 51.02 | 58.31 | 65.60 | | |
| | | 100 | | | 26.42 | 33.02 | 39.63 | 46.23 | 52.84 | 59.44 | 66.05 | 72.65 | 79.26 | 92.46 | 105.67 | 118.88 | | |
| 24 | 30 | 80 | | | | 21.87 | 26.24 | 30.61 | 34.99 | 39.36 | 43.73 | 48.10 | 52.48 | 61.22 | 69.97 | 78.72 | | |
| | | 100 | | | | 39.63 | 47.55 | 55.48 | 63.40 | 71.33 | 79.26 | 87.18 | 95.11 | 110.96 | 126.81 | 142.66 | | |
| 25 | 30 | 80 | | | | 22.78 | 27.33 | 31.89 | 36.44 | 41.00 | 45.55 | 50.11 | 54.66 | 63.78 | 72.89 | 82.00 | | |
| | | 100 | | | | 41.28 | 49.53 | 57.79 | 66.05 | 74.30 | 82.56 | 90.81 | 99.07 | 115.58 | 132.09 | 148.60 | | |
| 28 | 35 | 80 | | | | | 30.61 | 35.71 | 40.82 | 45.92 | 51.02 | 56.12 | 61.22 | 71.43 | 81.63 | 91.84 | | |
| | | 100 | | | | | 55.48 | 64.73 | 73.97 | 83.22 | 92.46 | 101.71 | 110.96 | 129.45 | 147.94 | 166.44 | | |
| 32 | 40 | 80 | | | | | | 40.82 | 46.65 | 52.48 | 58.31 | 64.14 | 69.97 | 81.63 | 93.29 | 104.96 | | |
| | | 100 | | | | | | 73.97 | 84.54 | 95.11 | 105.67 | 116.24 | 126.81 | 147.94 | 169.08 | 190.21 | | |
| 36 | 45 | 80 | | | | | | 45.92 | 52.48 | 59.04 | 65.60 | 72.16 | 78.72 | 91.84 | 104.96 | 118.08 | | |
| | | 100 | | | | | | 83.22 | 95.11 | 107.00 | 118.88 | 130.77 | 142.66 | 166.44 | 190.21 | 213.99 | | |
| 40 | 50 | 80 | | | | | | 51.02 | 58.31 | 65.60 | 72.89 | 80.17 | 87.46 | 102.04 | 116.62 | 131.19 | | |
| | | 100 | | | | | | 92.46 | 105.67 | 118.88 | 132.09 | 145.30 | 158.51 | 184.93 | 211.35 | 237.77 | | |
| Embedment (mm) | | | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 700 | 800 | 900 | | |

*Note: Minimum concrete cover based on minimum slab thickness of 200mm according to Eurocode 2 Part 1.2 (EN 1992-1-2)

**Note: Performance data based on hammer drilling technique. For data using core drilling technique, please refer to Ramset Engineer.

Bold values depicts design tensile steel resistance governs.

Note: Design resistance is based on 20 MPa concrete strength. For values in higher concrete strengths, and design optimisation, please refer to Ramset iExpert Anchor Software.

Fire Rated Anchoring Systems

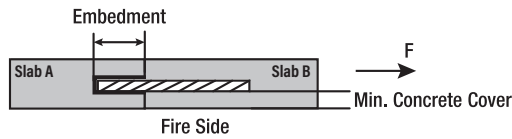
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Design Case 3

Fire resistance duration = 90 minutes

For Reinforcing Bar Steel Grade - 500 MPa and Concrete cylinder compressive strength $f'_c = 20$ MPa

| Rebar Size | Hole Diameter (mm) | *Min. Concrete Cover(mm) | **Design resistance in accordance with Eurocode 2 for fire duration 90 minutes - $R_{d,fi}$ (kN) | | | | | | | | | | | | | | | |
|----------------|--------------------|--------------------------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------------|--------------|--|--|
| | | | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 700 | 800 | 900 | 1000 | | |
| 10 | 12 | 90 | 4.05 | 5.39 | 6.74 | 8.09 | 9.44 | 10.79 | 12.14 | 13.49 | 14.84 | 16.18 | 18.88 | 21.58 | 24.28 | 26.97 | | |
| | | 100 | 5.28 | 7.03 | 8.79 | 10.55 | 12.31 | 14.07 | 15.83 | 17.59 | 19.34 | 21.10 | 24.62 | 28.14 | 31.42 | 31.42 | | |
| 12 | 15 | 90 | 4.86 | 6.47 | 8.09 | 9.71 | 11.33 | 12.95 | 14.57 | 16.18 | 17.80 | 19.42 | 22.66 | 25.90 | 29.13 | 32.37 | | |
| | | 100 | 6.33 | 8.44 | 10.55 | 12.66 | 14.77 | 16.88 | 18.99 | 21.10 | 23.21 | 25.32 | 29.54 | 33.76 | 37.98 | 42.20 | | |
| 16 | 20 | 90 | | 8.63 | 10.79 | 12.95 | 15.11 | 17.26 | 19.42 | 21.58 | 23.74 | 25.90 | 30.21 | 34.53 | 38.84 | 43.16 | | |
| | | 100 | | 11.25 | 14.07 | 16.88 | 19.70 | 22.51 | 25.32 | 28.14 | 30.95 | 33.76 | 39.39 | 45.02 | 50.65 | 56.27 | | |
| 20 | 25 | 90 | | | 13.49 | 16.18 | 18.88 | 21.58 | 24.28 | 26.97 | 29.67 | 32.37 | 37.76 | 43.16 | 48.55 | 53.95 | | |
| | | 100 | | | 17.59 | 21.10 | 24.62 | 28.14 | 31.65 | 35.17 | 38.69 | 42.20 | 49.24 | 56.27 | 63.31 | 70.34 | | |
| 24 | 30 | 90 | | | | 19.42 | 22.66 | 25.90 | 29.13 | 32.37 | 35.61 | 38.84 | 45.32 | 51.79 | 58.27 | 64.74 | | |
| | | 100 | | | | 25.32 | 29.54 | 33.76 | 37.98 | 42.20 | 46.42 | 50.65 | 59.09 | 67.53 | 75.97 | 84.41 | | |
| 25 | 30 | 90 | | | | 20.23 | 23.60 | 26.97 | 30.35 | 33.72 | 37.09 | 40.46 | 47.21 | 53.95 | 60.69 | 67.44 | | |
| | | 100 | | | | 26.38 | 30.77 | 35.17 | 39.57 | 43.96 | 48.36 | 52.76 | 61.55 | 70.34 | 79.13 | 87.93 | | |
| 28 | 35 | 90 | | | | | 26.44 | 30.21 | 33.99 | 37.76 | 41.54 | 45.32 | 52.87 | 60.42 | 67.98 | 75.53 | | |
| | | 100 | | | | | 34.47 | 39.39 | 44.31 | 49.24 | 54.16 | 59.09 | 68.93 | 78.78 | 88.63 | 98.48 | | |
| 32 | 40 | 90 | | | | | | 34.53 | 38.84 | 43.16 | 47.48 | 51.79 | 60.42 | 69.05 | 77.69 | 86.32 | | |
| | | 100 | | | | | | 45.02 | 50.65 | 56.27 | 61.90 | 67.53 | 78.78 | 90.04 | 101.29 | 112.55 | | |
| 36 | 45 | 90 | | | | | | 38.84 | 43.70 | 48.55 | 53.41 | 58.27 | 67.98 | 77.69 | 87.40 | 97.11 | | |
| | | 100 | | | | | | 50.65 | 56.98 | 63.31 | 69.64 | 75.97 | 88.63 | 101.29 | 113.95 | 126.61 | | |
| 40 | 50 | 90 | | | | | | 43.16 | 48.55 | 53.95 | 59.34 | 64.74 | 75.53 | 86.32 | 97.11 | 107.90 | | |
| | | 100 | | | | | | 56.27 | 63.31 | 70.34 | 77.37 | 84.41 | 98.48 | 112.55 | 126.61 | 140.68 | | |
| Embedment (mm) | | | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 700 | 800 | 900 | 1000 | | |

*Note: Minimum concrete cover based on minimum slab thickness of 200mm according to Eurocode 2 Part 1.2 (EN 1992-1-2)

**Note: Performance data based on hammer drilling technique. For data using core drilling technique, please refer to Ramset Engineer. Bold values depicts design tensile steel resistance governs

Design Case 4

Fire resistance duration = 120 minutes

For Reinforcing Bar Steel Grade - 500 MPa and Concrete cylinder compressive strength $f'_c = 20$ MPa

| Rebar Size | Hole Diameter (mm) | *Min. Concrete Cover(mm) | **Design resistance in accordance with Eurocode 2 for fire duration 120 minutes - $R_{d,fi}$ (kN) | | | | | | | | | | | | | | | |
|----------------|--------------------|--------------------------|---|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--|--|
| | | | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 700 | 800 | 900 | 1000 | 1100 | | |
| 10 | 12 | 90 | 3.64 | 4.55 | 5.47 | 6.38 | 7.29 | 8.20 | 9.11 | 10.02 | 10.93 | 12.75 | 14.57 | 16.40 | 18.22 | 20.04 | | |
| | | 100 | 4.64 | 5.80 | 6.96 | 8.12 | 9.28 | 10.44 | 11.60 | 12.76 | 13.92 | 16.24 | 18.56 | 20.88 | 23.20 | 25.52 | | |
| 12 | 15 | 90 | 4.37 | 5.47 | 6.56 | 7.65 | 8.74 | 9.84 | 10.93 | 12.02 | 13.12 | 15.30 | 17.49 | 19.67 | 21.86 | 24.05 | | |
| | | 100 | 5.57 | 6.96 | 8.35 | 9.74 | 11.13 | 12.53 | 13.92 | 15.31 | 16.70 | 19.48 | 22.27 | 25.05 | 27.84 | 30.62 | | |
| 16 | 20 | 90 | | 7.29 | 8.74 | 10.20 | 11.66 | 13.12 | 14.57 | 16.03 | 17.49 | 20.40 | 23.32 | 26.23 | 29.15 | 32.06 | | |
| | | 100 | | 9.28 | 11.13 | 12.99 | 14.85 | 16.70 | 18.56 | 20.41 | 22.27 | 25.98 | 29.69 | 33.40 | 37.11 | 40.83 | | |
| 20 | 25 | 90 | | | 10.93 | 12.75 | 14.57 | 16.40 | 18.22 | 20.04 | 21.86 | 25.50 | 29.15 | 32.79 | 36.43 | 40.08 | | |
| | | 100 | | | 13.92 | 16.24 | 18.56 | 20.88 | 23.20 | 25.52 | 27.84 | 32.47 | 37.11 | 41.75 | 46.39 | 51.03 | | |
| 24 | 30 | 90 | | | | 15.30 | 17.49 | 19.67 | 21.86 | 24.05 | 26.23 | 30.60 | 34.98 | 39.35 | 43.72 | 48.09 | | |
| | | 100 | | | | 19.48 | 22.27 | 25.05 | 27.84 | 30.62 | 33.40 | 38.97 | 44.54 | 50.10 | 55.67 | 61.24 | | |
| 25 | 30 | 90 | | | | 15.94 | 18.22 | 20.49 | 22.77 | 25.05 | 27.33 | 31.88 | 36.43 | 40.99 | 45.54 | 50.10 | | |
| | | 100 | | | | 20.30 | 23.20 | 26.10 | 29.00 | 31.89 | 34.79 | 40.59 | 46.39 | 52.19 | 57.99 | 63.79 | | |
| 28 | 35 | 90 | | | | | 20.40 | 22.95 | 25.50 | 28.05 | 30.60 | 35.71 | 40.81 | 45.91 | 51.01 | 56.11 | | |
| | | 100 | | | | | 25.98 | 29.23 | 32.47 | 35.72 | 38.97 | 45.46 | 51.96 | 58.45 | 64.95 | 71.44 | | |
| 32 | 40 | 90 | | | | | | 26.23 | 29.15 | 32.06 | 34.98 | 40.81 | 46.64 | 52.47 | 58.29 | 64.12 | | |
| | | 100 | | | | | | 33.40 | 37.11 | 40.83 | 44.54 | 51.96 | 59.38 | 66.80 | 74.23 | 81.65 | | |
| 36 | 45 | 90 | | | | | | 29.51 | 32.79 | 36.07 | 39.35 | 45.91 | 52.47 | 59.02 | 65.58 | 72.14 | | |
| | | 100 | | | | | | 37.58 | 41.75 | 45.93 | 50.10 | 58.45 | 66.80 | 75.16 | 83.51 | 91.86 | | |
| 40 | 50 | 90 | | | | | | 32.79 | 36.43 | 40.08 | 43.72 | 51.01 | 58.29 | 65.58 | 72.87 | 80.16 | | |
| | | 100 | | | | | | 41.75 | 46.39 | 51.03 | 55.67 | 64.95 | 74.23 | 83.51 | 92.78 | 102.06 | | |
| Embedment (mm) | | | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 700 | 800 | 900 | 1000 | 1100 | | |

*Note: Minimum concrete cover based on minimum slab thickness of 200mm according to Eurocode 2 Part 1.2 (EN 1992-1-2)

**Note: Performance data based on hammer drilling technique. For data using core drilling technique, please refer to Ramset Engineer.

Note: Design resistance is based on 20 MPa concrete strength. For values in higher concrete strengths, and design optimisation, please refer to Ramset iExpert Anchor Software.