



CÁT TƯỜNG

Epcon**G5**^{pro}

High - Strength Epoxy Adhesive



RamsetTM



chongthamcattuong.com



chongthamcattuong

RAMSET EPCON G5 PRO 600ML



I. GIỚI THIỆU

Ramset Epcon G5 Pro: là loại hóa chất cấy thép gốc Epoxy 2 thành phần, cường độ cao, chịu được lực rung động. Sản phẩm được đóng gói trong tuýp nhựa cứng màu đen – cam theo tỷ lệ 2 : 1 với tổng dung tích là 600 ml. Ramset Epcon G5 Pro được dùng để cấy thép hoặc thanh ren vào hầu hết các loại vật liệu nền như: bê tông, đá tự nhiên, sản phẩm có thể thi công trong điều kiện vật liệu nền khô ráo, ẩm ướt hoặc ngập nước, phù hợp với lỗ khoan bằng máy khoan búa hoặc máy khoan ống kim cương ở điều kiện nhiệt độ vật liệu nền từ 30 - 35 °C thời gian lắp đặt cho phép đến 8 phút, thời gian đông cứng và đủ lực tải chỉ trong vòng 4 giờ. Sản phẩm được sản xuất tại Úc.

Chứng chỉ kỹ thuật ETA 18/0675

Chứng chỉ thi công trong nguồn nước AWQC

Chứng chỉ chống cháy SIGGMA.

1. Các trường hợp sử dụng Ramset Epcon G5 Pro

- Cấy bổ sung thép chờ vào tường vây barrette, cầu thang bộ, vά hoặc mở rộng sàn bê tông
- Lắp đặt kết cấu thép như dầm, kèo, cột, cầu thang máy, cầu thang thoát hiểm, mái che vào bê tông
- Lắp đặt máy móc thiết bị có tải trọng lớn và độ rung động cao trong quá trình vận hành
- Bổ sung bu lông chờ do không có bu lông chờ trước hoặc có nhưng bị sai vị trí hoặc hư hỏng.

2. Đặc tính kỹ thuật của sản phẩm :

- Vật liệu nền : Bê tông có và không có cốt thép, đá tự nhiên
- Điều kiện thi công : đáp ứng tốt cho cả lỗ khoan bằng máy khoan bê tông thông thường và khoan bê tông lấy lõi, có thể thi công trong điều kiện khô ráo, ẩm ướt hoặc ngập nước
- Thời gian thi công và đủ tải 100% :



Nhiệt độ vật liệu nền (°C)	Thời gian thao tác (phút)	Thời gian đủ tải (giờ)
< 10	150	24
10 - 15	40	18
15 - 20	25	12
20 - 25	18	8
25 - 30	12	6
30 - 35	8	4
35 - 40	6	2

3. Biện pháp thi công

Khoan lỗ với đường kính và độ sâu theo yêu cầu kỹ thuật:

- **EPCON G5 Pro + Thép vằn**

Đường kính thép (mm)	Đường kính lỗ khoan (mm)	Chiều sâu lỗ khoan (mm)	Ghi chú
8	12	80	Chiều sâu lỗ khoan sẽ được thay đổi tùy theo mác thép và mác bê tông
10	13	100	
12	15	120	
16	20	160	
20	25	200	
25	30	250	
28	35	280	
32	40	320	
40	50	400	

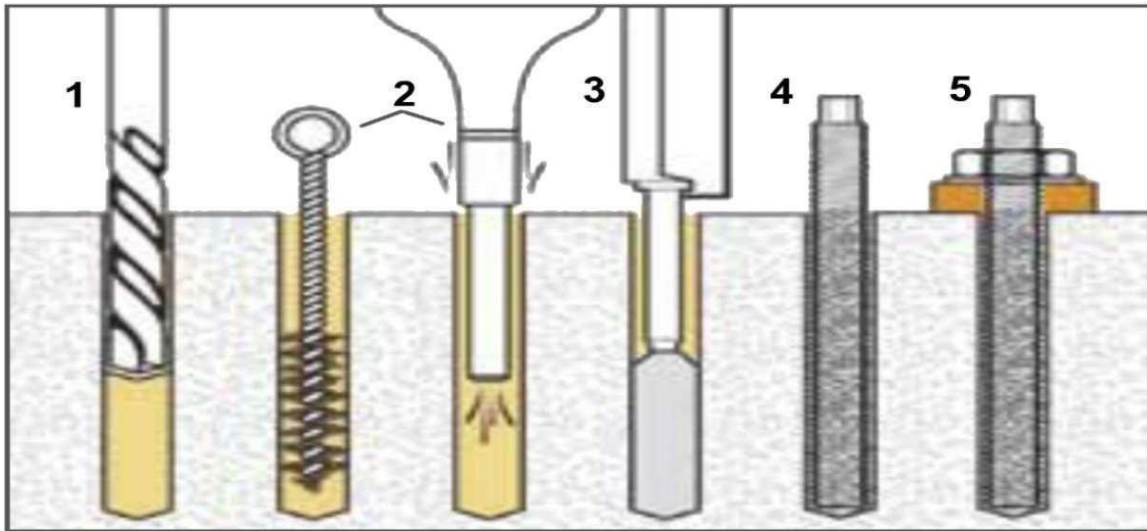
- **EPCON G5 Pro + Thanh ren 5.8**

Đường kính thanh ren (mm)	Đường kính lỗ khoan (mm)	Chiều sâu lỗ khoan (mm)	Lực siết bu lông (Nm)
M8	10	80	10
M10	12	90	20
M12	14	110	30
M16	18	125	60
M20	25	170	120
M24	28	210	200
M30	35	280	400

- **Qui trình thi công:**

Khoan lỗ, làm vệ sinh, bơm keo và lắp đặt theo trình tự sau :

1. Khoan lỗ
2. Làm sạch lỗ bằng chổi kim loại, thổi sạch bụi bằng máy thổi hơi hoặc máy nén khí
Làm sạch lỗ bằng chổi kim loại, thổi sạch bụi bằng máy thổi hơi hoặc máy nén khí (lần 2)
3. Lắp vòi trộn vào tuýp keo sau đó lắp tuýp keo vào súng bơm, bơm bỏ khoảng 10ml dầu vòi do hóa chất chưa trộn đều, bơm hóa chất từ đáy lỗ khoan sao cho hóa chất điền đầy khoảng 55-60% lỗ
4. Cắm thép hoặc thanh ren từ ngoài vào trong, vừa cắm vừa xoay để hóa chất bám đều
5. Chờ hoá chất đông cứng theo thời gian đã được khuyến cáo. Trong thời gian chờ cần giữ cho thanh thép, thanh ren được cố định.



II. HƯỚNG DẪN BẢO QUẢN

Hóa chất cấy thép Epcon G5 Pro có thời hạn sử dụng là 12 tháng kể từ ngày sản xuất với điều kiện bảo quản đúng theo yêu cầu của nhà sản xuất

Đối với tuýp sản phẩm thi công dở dang cần được để nguyên vòi trộn đang sử dụng với tuýp hóa chất, khi có nhu cầu dung lại thì tháo vòi trộn cũ thay bằng vòi trộn mới và bơm bỏ khoảng 10 ml dầu vòi hóa chất chưa trộn đều.

Cũng như hầu hết các loại hóa chất khác, hóa chất cấy thép Ramset Epcon G5 Pro yêu cầu phải được bảo quản trong kho đáp ứng một số yêu cầu sau :

- **Nhiệt độ không vượt quá 30 °C (nếu bảo quản ở nhiệt độ cao hơn thì sản phẩm sẽ bị khô cứng trước thời hạn và không thể sử dụng được nữa)**
- **Không để ánh nắng trực tiếp chiếu vào sản phẩm**
- **Kho khô ráo, thoáng mát**



Compliant

High performance anchoring epoxy for concrete
Approved for cracked concrete & seismic zones

Fast Cure!

Same day loading
Higher Productivity

EPCONTM
Pure Epoxy

G5^{PRO}



MULTI
DIRECTIONAL
APPLICATION



Product Advantages

- ETA approved for cracked concrete and seismic zones
- High performance pure epoxy with 100 years working life
- Fast cure for same day loading (2 hours at 35°C)
- All weather conditions
- Fast, low fatigue dispensing
- Non shrink epoxy – suitable for cored and oversized holes.
- Sag resistant – suitable for overhead applications.
- Low VOC & odourless, can be used indoors.
- Re-sealable tip

Applications

- Post-installed system for bond anchor e.g. starter bars and structural steel connections
- Post-installed system for rebar connection e.g. dowel bars for reinforce concrete walls, columns, slab and beams

Substrates

- Solid Concrete
- Cracked Concrete
- Stone
- Masonry block and brick

Applicable Standards

- Eurocodes
- AS5216:2018
- AS5216:2021
- NCC 2019
- 100 Years Working Life



Damp
Holes



Flooded
Holes



Drilled
Holes

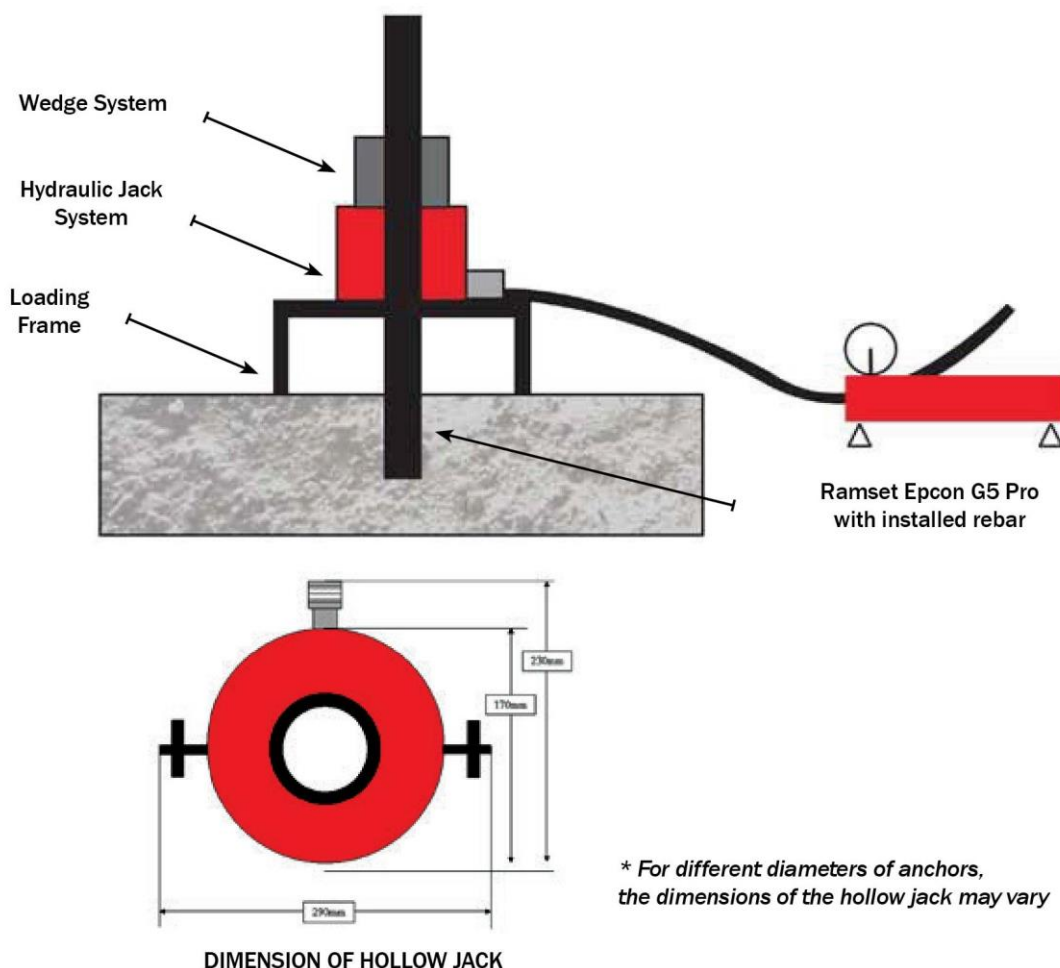


Dustless
Drilling

METHOD STATEMENT FOR NON-DESTRUCTIVE TENSILE TEST ON RAMSET EPCON G5 PRO CHEMICAL WITH REBARS INSTALLED

1. Prior to carrying out the test, the test equipment (Hydraulic Jack System with calibration certification attached) must be setup in position according to BS5080 Part 1.
2. The loading frame is placed through the rebar and sits directly on the base concrete. The appropriate type of hydraulic jack is mounted on top of the loading frame and wedged in place with a corresponding wedge system to engage the rebar tightly at the end of the setup before applying the load.
3. A central load is applied gradually by means of the hydraulic jack system, via a hollow piston cylinder onto the wedges to create a reaction force equaling to a tensile pull-out effect, up to the required design test load.
4. The load achieved is indicated in the calibrated pressure gauge, usually expressed in KiloNewtons (kN) for ease of load determination. During or at the end of the loading, the achieved load and the mode of failure, if any, are recorded in the field test record form. The recorded field test record form shall be acknowledged by all parties present, namely the tester, the contractor and the consultant and shall form part of the final test report to be submitted to the contractor for filing purpose.

TEST SETUP (N.T.S.)



EPCON™ G5 PRO

CHEMICAL INJECTION - NON-CRACKED & CRACKED CONCRETE

GENERAL INFORMATION

Performance Related



Material Specification



Installation Related



PRODUCT

EPCON™ G5 PRO 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-18/0675

Design according to:

- EN1992-4 (formerly ETAG001 Annex C, E & TR045)

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



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	10°C	40°C

SERVICE TEMPERATURE LIMITS

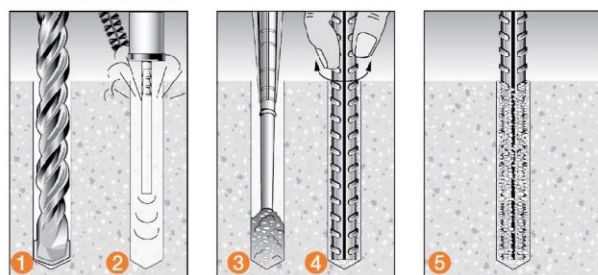
-40°C to 70°C

SETTING TIMES

Base Material Temperature [°C]	Cartridge Temperature [°C]	T Work [mins]	T Load [hrs]
+5	Minimum +10	300	24
+5°C to +10		150	
+10°C to +15	+10°C to +15	40	18
+15°C to +20	+15°C to +20	25	12
+20°C to +25	+20°C to +25	18	8
+25°C to +30	+25°C to +30	12	6
+30°C to +35	+30°C to +35	8	4
+35°C to +40	+35°C to +40	6	2
Ensure cartridge is ≥ 10°C			

T Work is typical gel time at highest base material temperature in the range.
T Load is minimum set time required until load can be applied at the lowest temperature in the range.

INSTALLATION

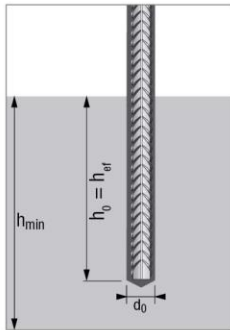


1. Drill recommended diameter and depth hole.
2. **Important:** Use Ramset™ Dustless Drilling System to ensure holes are clean. Alternatively, clean dust and debris from hole with stiff wire or nylon brush and blower in the following sequence: blow x 2, brush x 2, blow x 2, brush x 2, blow x 2.
3. Dispense adhesive to waste until colour is uniform light grey (2-3 trigger pulls). Insert mixing nozzle to bottom of hole. Fill hole to 3/4 the hole depth slowly, ensuring no air pockets form.
4. Insert Ramset™ ChemSet™ Anchor Stud/rebar to bottom of hole while turning.
5. Allow EPCON™ G5 PRO to cure as per setting times.

EPCON™ G5 PRO

REBAR APPLICATION

HIGH STRENGTH EPOXY



Technical data							
Rebar Diameter	Rebar depth	Minimum Thickness of Member	Standard Drill depth	Min Spacing	Min Edge distance	Drill hole diameter	Torque moment
(mm) d	(mm) h _{ef}	(mm) h _{min}	(mm) h ₀	(mm) S _{min}	(mm) C _{min}	(mm) d ₀	(Nm) T _{inst}
Ø8	80	115	80	40	40	12	10
Ø10	90	125	90	40	40	13	20
Ø12	110	145	110	40	40	15	40
Ø16	125	162	125	40	40	20	80
Ø20	170	215	170	50	50	25	120
Ø25	210	265	210	50	50	30	180
Ø32	280	349	280	70	70	40	200

	Rebar Mechanical Properties								
	Rebar Diameter		Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
	Cross Section (mm²)		50.3	78.5	113	201	314	491	804
CB 300-V	min yield strength	f _{yk}	(N/mm²)	300	300	300	300	300	300
	min tensile strength	f _{uk}		450	450	450	450	450	450
CB 400-V	min yield strength	f _{yk}	(N/mm²)	400	400	400	400	400	400
	min tensile strength	f _{uk}		570	570	570	570	570	570
CB 500-V	min yield strength	f _{yk}	(N/mm²)	500	500	500	500	500	500
	min tensile strength	f _{uk}		650	650	650	650	650	650

CHEMICAL ANCHORING - REINFORCING BAR ANCHORAGE

EPCON™ G5 PRO

CHEMICAL INJECTION - NON-CRACKED & CRACKED CONCRETE

GENERAL INFORMATION

Performance Related	Material Specification	Installation Related
    	   	     

PRODUCT

EPCON™ G5 PRO 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-18/0675

Design according to:

- EN1992-4 (formerly ETAG001 Annex C, E & TR045)

BENEFITS, ADVANTAGES AND FEATURES

- 100 year working life

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- 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

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Principal Applications

- Threaded Studs
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- Hand Rails
- Road Stitching

RECOMMENDED INSTALLATION TEMPERATURES

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SERVICE TEMPERATURE LIMITS

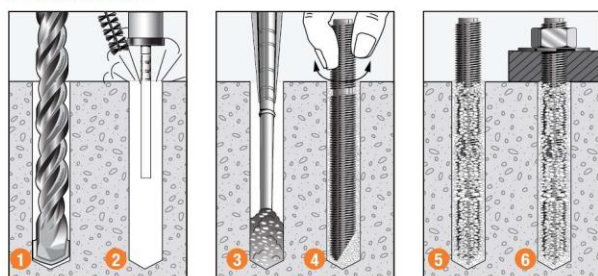
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SETTING TIMES

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+5	Minimum +10	300	24
+5°C to +10		150	
+10°C to +15	+10°C to +15	40	18
+15°C to +20	+15°C to +20	25	12
+20°C to +25	+20°C to +25	18	8
+25°C to +30	+25°C to +30	12	6
+30°C to +35	+30°C to +35	8	4
+35°C to +40	+35°C to +40	6	2
Ensure cartridge is ≥ 10°C			

T Work is typical gel time at highest base material temperature in the range.
T Load is minimum set time required until load can be applied at the lowest temperature in the range.

Installation



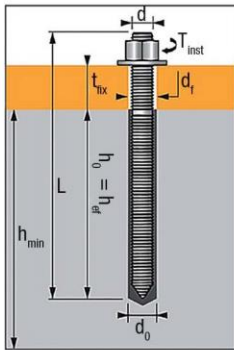
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3. Dispense adhesive to waste until colour is uniform light grey (2-3 trigger pulls). Insert mixing nozzle to bottom of hole. Fill hole to 3/4 the hole depth slowly, ensuring no air pockets form.
4. Insert Ramset™ ChemSet™ Anchor Stud/rebar to bottom of hole while turning.
5. Allow EPCON™ G5 PRO to cure as per setting times.
6. Attach fixture.

EPCON™ G5 PRO

CHEMSET ANCHOR STUD APPLICATION

CHEMICAL ANCHORING - ANCHOR STUDS

HIGH STRENGTH EPOXY



Technical data								
Anchor Stud Size (mm)	Anchor depth (mm)	Minimum Thickness of Member (mm)	Standard Drill depth (mm)	Min Spacing (mm)	Min Edge distance (mm)	Drill hole diameter (mm)	Clearance diameter (mm)	Torque moment (Nm)
d	h _{ef}	h _{min}	h _o	S _{min}	C _{ef}	ød _o	d _f	T _{inst}
M8	80	115	80	40	40	10	9	10
M10	90	125	90	40	40	12	12	20
M12	110	145	110	40	40	14	14	40
M16	125	162	125	40	40	18	18	80
M20	170	215	170	50	50	25	22	120
M24	210	263	210	50	50	28	26	160
M30	280	345	280	60	60	35	33	200

* Values refer to ETA

Anchor Stud Mechanical Properties								
Chemset™ Anchor Studs Grade 5.8	M8	M10	M12	M16	M20	M24	M30	
Min. Tensile Strength, f_{uk} (N/mm ² or MPa)	540	540	540	540	520	520	520	
Yield Strength, f_{yk} (N/mm ² or MPa)	430	430	430	430	420	420	420	
Nominal Stressed Area, $A_{s, nom}$ mm ²	36.6	58.0	84.3	157.0	245.0	353.0	561.0	

Chemset™ Anchor Studs Stainless Steel A4	M8	M10	M12	M16	M20	M24	M30	
Min. Tensile Strength, f_{uk} (N/mm ² or MPa)	700	700	700	700	700	700	-	
Yield Strength, f_{yk} (N/mm ² or MPa)	350	350	350	350	350	350	-	
Nominal Stressed Area, $A_{s, nom}$ (mm ²)	36.6	58.0	84.3	157.0	245.0	353.0	-	

EPCON™ G5™ PRO - Physical Properties

Date: October 2021

Physical Properties of Ramset™ Epcon™ G5™ PRO (EG5P600) have been tested with the following results:

Physical Properties

Property		Value	Unit	Test Standard
Density		1,5	g/cm ³	ASTM D 1875 @ +20°C
Compressive Strength	24 hrs	90	N/mm ²	ASTM D 695 @ +20°C
	7 days	100		
Tensile Strength	24 hrs	25	N/mm ²	ASTM D 638 @ +20°C
	7 days	27		
Elongation at Break	24 hrs	6,6	%	ASTM D 638 @ +20°C
	7 days	5,7		
Tensile Modulus	24 hrs	6,7	GN/m ²	ASTM D 638 @ +20°C
	7 days	8,0		
Flexural Strength	24 hrs	45	N/mm ²	ASTM D 790 @ +20°C
HDT	7 days	49	°C	ASTM D 648 @ +20°C
VOC		0	g/l	ASTM D 2369

Sincerely,



Andrew Rossiter
Ramset Product Manager



Internet: www.awqc.com.au

Email: producttesting@awqc.com.au

FINAL REPORT

Report ID : 320541

Report Information

Submitting Organisation : 00109275 : RamsetReid
Account : 130255 : RamsetReid
AWQC Reference : 130255-2021-CSR-1 : Prod Test:
Project Reference : PT-4685
Product Designation : Epcon™ G5 PRO
Composition of Product : Two Component Epoxy based adhesive. (2 Parts Resin to 1 Part Hardener).
Product Manufacturer : RAMSETREID (A DIVISION OF ITW AUSTRALIA PTY LTD), Ramset Drv, Chimside Pk, VIC, AUS
Use of Product : In-Line/Bonded Injection Type Anchor.
Sample Selection: As provided by the submitting organisation.
Testing Requested : **AS/NZS 4020 TESTING OF PRODUCTS FOR USE IN CONTACT WITH DRINKING WATER**
Product Type : Composite
Samples : Samples were prepared and controlled as described in Appendix A of AS/NZS 4020:2018

Extracts : Extracts were prepared as described in Appendix/Clause C, D, E, F, H, 6.8.
Project Completion Date : 23-Sep-2021
Project Comment : Sample received on the 15-Jul-2021, testing commenced on the 20-Jul-2021.

PLEASE NOTE THAT THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL

THE RESULTS STATED IN THIS REPORT RELATE TO THE SAMPLE OF THE PRODUCT SUBMITTED FOR TESTING. ANY CHANGES IN THE MATERIAL FORMULATION, PROCESS OF MANUFACTURE, THE METHOD OF APPLICATION, OR THE SURFACE AREA-TO-VOLUME RATIO IN THE END USE, COULD AFFECT THE SUITABILITY OF THE PRODUCT FOR USE IN CONTACT WITH DRINKING WATER

Michael Glasson
APPROVED SIGNATORY



Corporate Accreditation No.1115
Chemical and Biological Testing
Accredited for compliance with ISO/IEC 17025





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for Construction Prague**

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Member of



www.eota.eu

European Technical Assessment

ETA 18/0675
of 06/06/2021

Technical Assessment Body issuing the ETA:
for Construction Prague

Technical and Test Institute

Trade name of the construction product

Chemset TM Reo502 TM EF Plus
Epcon TM C6 EF Plus
Epcon TM G5 PRO

**Product family to which the construction
product belongs**

Product area code: 33
Bonded injection type anchor for use in
cracked and uncracked concrete

Manufacturer

Ramsetreid
A Division of ITW Australia Pty Ltd
1 Ramset Drive, Chirnside Park. Vic 3116
Australia

Manufacturing plant

Ramsetreid Plant

**This European Technical Assessment
contains**

19 pages including 16 Annexes which form
an integral part of this assessment.

**This European Technical Assessment is
issued in accordance with regulation
(EU) No 305/2011, on the basis of**

EAD 330499-01-0601
Bonded fasteners for use in concrete

This version replaces

ETA 18/0675 issued on 16/01/2020

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for Construction Prague**

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European Technical Assessment

ETA 20/0752
of dd/mm/2021

Technical Assessment Body issuing the ETA: Technical and Test Institute for Construction Prague

Trade name of the construction product

ChemSet™ Reo502™ EF Plus
Epcon™ C6 EF Plus
Epcon™ G5 PRO

Product family to which the construction product belongs

Product area code: 33
Post installed rebar connections
with ChemSet™ Reo502™ EF Plus,
Epcon™ C6 EF Plus, Epcon™ G5 PRO
injection mortar

Manufacturer

Ramsetreid
A Division of ITW Australia Pty Ltd
1 Ramset Drive, Chirnside Park. Vic 3116
Australia

Manufacturing plant

Ramsetreid Plant 3

This European Technical Assessment contains

16 pages including 13 Annexes which form an integral part of this assessment.

This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of

EAD 330087-01-0601
Systems for post-installed rebar connections with mortar

This version replaces

ETA 20/0752 issued on 11/10/2020

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Job title: **Ramsetreid PIR ChemSet Reo502 EF Plus, Epcon C6 EF Plus, Epcon G5 PRO
Fire Analysis**

Report code: **259 - 2021- R01**

Report title: **Fire Evaluation of Post-installed rebar connections with Ramsetreid ChemSet
Reo502 EF Plus, Epcon C6 EF Plus, Epcon G5 PRO injection systems**

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Reviews

Rev.n.	Subject	Date	Pages	Approved by
01	Amendment of Tables: Table 7.3, Table 7.4, Table 7.5, Table 7.6, Table 7.7, Table 7.8, Table 7.9, Table 7.10, Table 8.1, Table 8.2 Figures: Figure 8.6, Figure 8.7	15/12/2021	21-52, 57,58	Leonardo Marconi, M.Sc.
02	Addition of concrete covers 100, 120, 140 and 160mm. Addition of Table 7.11, Table 7.12, Table 7.13, Table 7.14	03/01/2022	16, 53-69	Leonardo Marconi, M.Sc.
03	Figure 6.2 amended	11/01/2022	13	Leonardo Marconi, M.Sc.

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