ICCONS®

25/0437

TDS | 2022.3

POLYPRO BIS-P GEN2

PolyPRO GEN 2

25/0437

POLYPRO BIS-P GEN2

POLYPRO INJECTION SYSTEM WITH ETA ASSESSMENT OPTION 1 FOR CRACKED AND NON-CRACKED CONCRETE.

AS 5216 COMPLIANT

USE CONDITIONS

- Static and quasi-static loads: Threaded rod M8 to M24, Rebar Ø8 to Ø25.
- Seismic action for performance category C1: Threaded rod M8 to M16*.
- Seismic action for performance category C2: Threaded rod M12 to M16*.
- In reinforced or unreinforced cracked and non-cracked concrete strength classes C20/25 to C50/60
- In dry, wet & flooded holes.
- Structures subject to dry internal and permanent damp internal conditions.
- Structures subject to external atmospheric exposure.
- Overhead installation allowed.

*Except hot-dip galvanized rods

TYPICAL APPLICATIONS

- Infrastructure construction (Roads, Viaducts, Sound Barriers, Crash barriers, harbours, high rise construction, and steel construction)
- Production Facilities (Installation of Cranes, robots, conveyors lines etc)

APPROVALS

- ETA - 25/0437
- ETA - 25/0438
- ETA - 25/0439
- National Code Compliant
- A+ ÉMISSIONS DANS L'AIR INTÉRIEUR® (Indoor Air Emissions)

TEMPERATURE RANGE

BIS-P GEN2 injection mortar may be applied in the temperature ranges given below. An elevated base material temperature leads to a reduction of the bond resistance.

Max. long term base material temperature: Long term elevated base material temperatures are roughly constant over significant periods of time.
Max. short term base material temperature: Short term elevated base material temperatures are those that occur over brief intervals, e.g. as a result of diurnal cycling.

Temperature Range	Temperature Base Material	Max. Long Term Base Material Temperature	Max. Short Term Base Material Temperature
Temp. Range I	-40°C to +40°C	+24°C	+40°C
Temp. Range II	-40°C to +80°C	+50°C	+80°C

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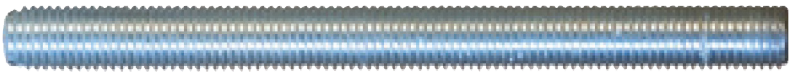
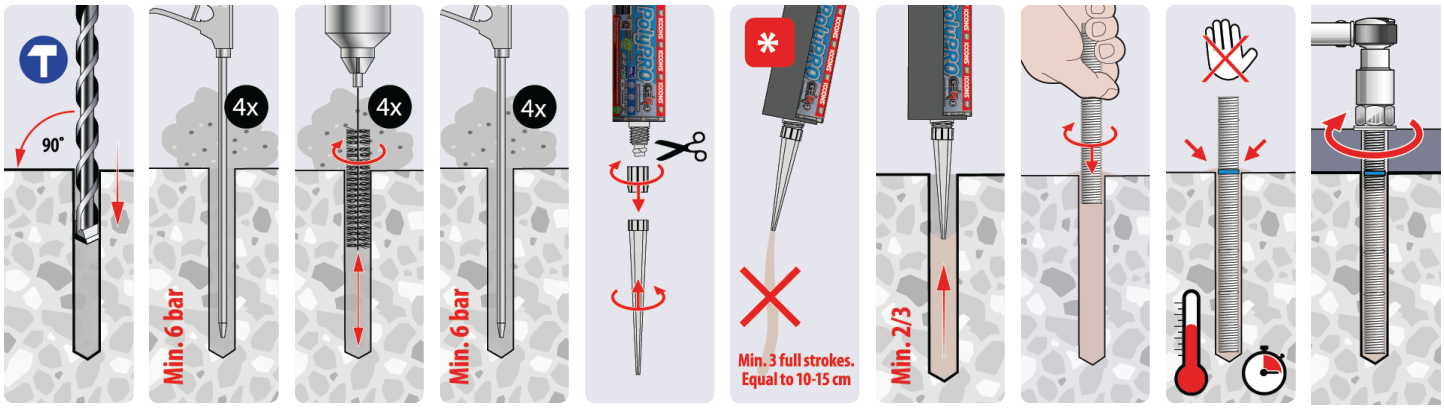
THREADED RODS



SUITABLE ANCHOR RODS M8-M24

- Steel 5.8 and 8.8 Zinc Plated, Hot Dip Galvanized or Sherardized
- Stainless Steel A2 and A4
- High Corrosion Resistant Steel 1.4529 and 1.4565

INSTALLATION PROCEDURES



CURING TIMES[1]

Temperature[2]	-5°C to -1°C	0°C to +4°C	+5°C to +9°C	+10°C to +14°C	+15°C to +19°C	+20°C to +29°C	+30°C to +34°C	+35°C to +39°C
Working Time	90 min	45 min	25 min	20 min	15 min	6 min	4 min	2 min
Curing Time	6 h	3 h	2 h	100 min	80 min	45 min	25 min	20 min

[1] Cartridge Temperature must be between +5°C and +40°C.
[2] Concrete Temperature

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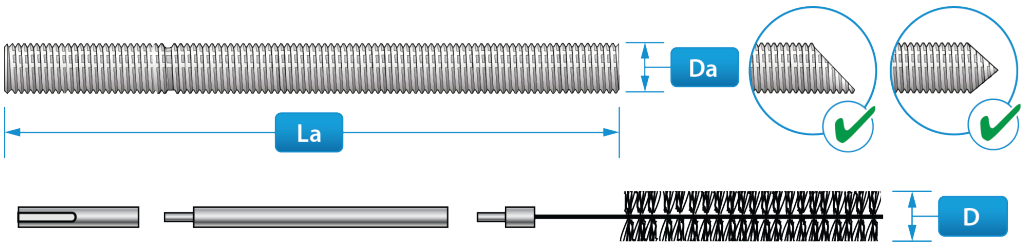
ETA - 25/0437

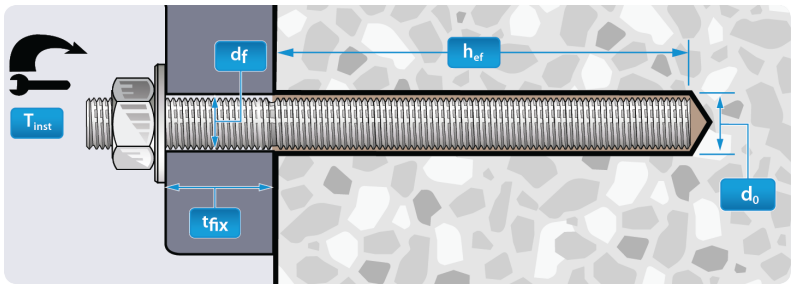
Specification Data for the use in Cracked and Non-Cracked Concrete and Hammer/Air Drilled Holes according to EAD 330499-02-0601 and AS 5216

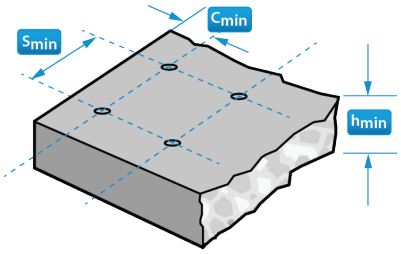


INSTALLATION DIMENSIONS

Anchor Size	D_a	Unit	M8	M10	M12	M16	M20	M24
Anchor Rod Length	L_a	**(mm)**	110	130	160	190	260	300
Min. Eff. Anchorage Depth	$h_{ef,min}$	**(mm)**	60	60	70	80	90	96
Max. Eff. Anchorage Depth	$h_{ef,max}$	**(mm)**	160	200	240	320	400	480
Anchorage Depth for Calculation	$h_{ef,calc}$	**(mm)**	80	90	110	125	170	210
Hole Diameter	d_o	**(mm)**	10	12	14	18	24	28
Diameter Clearance Hole in Fixture								
Prepositioned installation	d_f	**(mm)**	9	12	14	18	22	26
Push through installation	d_f	**(mm)**	12	14	16	20	24	30
Max. Fixture Height	$T_{fix} \leq$	**(mm)**	20	30	35	45	70	65
Recommended Torque[1])	$T_{inst} \leq$	**(Nm)**	10	20	40	80	120	160
Required Volume per cm Embedment Depth	V_s	**(ml/cm)**	0.44	0.59	0.75	1.09	2.25	2.87

[1] Max. recommended torque moment to avoid splitting failure during installation with minimum spacing and edge distance.





MEMBER THICKNESS, EDGE DISTANCE & SPACING

Anchor Size	D_a	Unit	M8	M10	M12	M16	M20	M24
Min. Member Thickness	h_{min}	**(mm)**	hef + 30 mm ≥ 100 mm			hef + 2do		
Min. Edge Distance	c_{min}	**(mm)**	40	50	60	80	100	120
Min. Spacing	s_{min}	**(mm)**	40	50	60	80	100	120

STEEL BRUSH DIMENSIONS

Anchor Size	D_a	Unit	M8	M10	M12	M16	M20	M24
Brush Diameter	D	**(mm)**	12	14	16	20	26	30
Min. Brush Diameter	D_{min}	**(mm)**	10.5	12.5	14.5	18.5	24.5	28.5

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STATIC AND QUASI-STATIC RESISTANCE (FOR A SINGLE ANCHOR)

All data in this section subject to:

- Correct setting (see setting instructions).
- No edge distance and spacing influence.
- Standard embedment depth ($h_{ef,calc}$), as specified in the 'Installation Dimensions' table.
- Concrete C20/25, f_{ck} = 20 N/mm².
- Temperature range I: (max. long/short term temperature +24°C / +40°C).
- Shear loads are calculated without the influence of a lever arm.
- Ψ_{sus} = 1.0, according to EN 1992-4:2018; eq. 7.14a.
- Recommended loads are with overall partial safety factor for action γ_G = 1.4.
- The partial safety factors for action depend on the type of loading and shall be taken from national regulations.

DESIGN RESISTANCE DRY/WET CONCRETE & FLOODED HOLES

HD hammer

Steel Decisive

Non-Cracked Concrete			D_a	M8	M10	M12	M16	M20	M24
Steel 5.8	**Tensile**	N_{Rd}	(kN)	9.5	12.6	18.4	27.9	47.5	70.4
	Shear	V_{Rd}	(kN)	8.8	13.6	20	37.6	59.2	84.8
Steel 8.8	**Tensile**	N_{Rd}	(kN)	9.5	12.6	18.4	27.9	47.5	70.4
	Shear	V_{Rd}	(kN)	12	18.4	27.2	50.4	78.4	112.8
A4-50	**Tensile**	N_{Rd}	(kN)	6.3	10.1	14.7	27.6	43	61.9
	Shear	V_{Rd}	(kN)	3.8	6.3	8.8	16.4	25.6	37
A4-70	**Tensile**	N_{Rd}	(kN)	9.5	12.6	18.4	27.9	47.5	70.4
	Shear	V_{Rd}	(kN)	8.3	12.8	19.2	35.3	55.1	79.5

HD hammer

Steel Decisive

Cracked Concrete			D_a	M8	M10	M12	M16	M20	M24
Steel 5.8	**Tensile**	N_{Rd}	(kN)	5	7.1	10.4	15.7	--	--
	Shear	V_{Rd}	(kN)	8.8	13.6	20	37.6	--	--
Steel 8.8	**Tensile**	N_{Rd}	(kN)	5	7.1	10.4	15.7	--	--
	Shear	V_{Rd}	(kN)	12	17	24.9	37.7	--	--
A4-50	**Tensile**	N_{Rd}	(kN)	5	7.1	10.4	15.7	--	--
	Shear	V_{Rd}	(kN)	3.8	6.3	8.8	16.4	--	--
A4-70	**Tensile**	N_{Rd}	(kN)	5	7.1	10.4	15.7	--	--
	Shear	V_{Rd}	(kN)	8.3	12.8	19.2	35.3	--	--

Combined Tension and Shear Loading Combined tension and shear loading in accordance with EN 1992-4:2018 and AS 5216. Please refer to ICCONS® DesignPRO software or contact ICCONS® engineering department at engineering@iccons.com.au for further information.

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STATIC AND QUASI-STATIC RESISTANCE (FOR A SINGLE ANCHOR)

All data in this section subject to:

- Correct setting (see setting instructions).
- No edge distance and spacing influence.
- Standard embedment depth ($h_{ef,calc}$), as specified in the Installation Dimensions table.
- Concrete C20/25, fck = 20 N/mm².
- Temperature range I: (max. long/short term temperature +24°C/+40°C).
- Shear loads are calculated without the influence of a lever arm.
- Ψ_{sus} = 1.0 according to EN 1992-4:2018; eq. 7.14a.
- Recommended loads are with overall partial safety factor for action Y_G = 1.4.
  The partial safety factors for action depend on the type of loading and shall be taken from national regulations.

RECOMMENDED LOADS DRY/WET CONCRETE & FLOODED HOLES

HD hammer

Non-Cracked Concrete			D_a	M8	M10	M12	M16	M20	M24
Steel 5.8	**Tensile**	N_{Rd}	(kN)	6.8	9	13.2	19.9	33.9	50.3
	Shear	V_{Rd}	(kN)	6.3	9.7	14.3	26.6	42.3	60.6
Steel 8.8	**Tensile**	N_{Rd}	(kN)	6.8	9	13.2	19.9	33.9	50.3
	Shear	V_{Rd}	(kN)	8.6	13.1	19.4	36	56	80.6
A4-50	**Tensile**	N_{Rd}	(kN)	4.5	7.2	10.5	19.7	30.7	44.2
	Shear	V_{Rd}	(kN)	2.7	4.5	6.3	11.7	18.3	26.4
A4-70	**Tensile**	N_{Rd}	(kN)	6.8	9	13.2	19.9	33.9	50.3
	Shear	V_{Rd}	(kN)	6	9.2	13.7	25.2	39.4	56.8

HD hammer

Cracked Concrete			D_a	M8	M10	M12	M16	M20	M24
Steel 5.8	**Tensile**	N_{Rd}	(kN)	3.6	5	7.4	11.2	--	--
	Shear	V_{Rd}	(kN)	6.3	9.7	14.3	26.9	--	--
Steel 8.8	**Tensile**	N_{Rd}	(kN)	3.6	5	7.4	11.2	--	--
	Shear	V_{Rd}	(kN)	8.6	12.1	17.8	26.9	--	--
A4-50	**Tensile**	N_{Rd}	(kN)	3.6	5	7.4	11.2	--	--
	Shear	V_{Rd}	(kN)	2.7	4.5	6.3	11.7	--	--
A4-70	**Tensile**	N_{Rd}	(kN)	3.6	5	7.4	11.2	--	--
	Shear	V_{Rd}	(kN)	6	9.2	13.7	25.2	--	--

Combined Tension and Shear Loading Combined tension and shear loading in accordance with EN 1992-4:2018 and AS 5216. Please refer to ICCONS® DesignPRO software or contact ICCONS® engineering department at engineering@iccons.com.au for further information.

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SEISMIC RESISTANCE (FOR A SINGLE ANCHOR)

All data in this section subject to:

- Correct setting (see setting instructions).
- No edge distance and spacing influence.
- Standard embedment depth ($h_{ef,calc}$), as specified in the Installation Dimensions table.
- Concrete C20/25, f_{ck} = 20 N/mm².
- Temperature range I: (max. long/short term temperature +24°C / +40°C).
- Shear loads are calculated without the influence of a lever arm.
- a_{gap} = 1.0 (using special filling washer, according to t.b.d. Annex A3).

DESIGN RESISTANCE DRY/WET CONCRETE & FLOODED HOLES IN CASE OF SEISMIC PERFORMANCE CATEGORY C1

Steel Decisive

Cracked Concrete			D_a	M8	M10	M12	M16	M20	M24
Steel 5.8	**Tensile**	$N_{Rd,eq,C1}$	(kN)	2.6	3.5	5.3	7.7	--	--
	Shear	$V_{Rd,eq,C1}$	(kN)	5.2	7.2	10.8	15.7	--	--
Steel 8.8	**Tensile**	$N_{Rd,eq,C1}$	(kN)	2.6	3.5	5.3	7.7	--	--
	Shear	$V_{Rd,eq,C1}$	(kN)	5.2	7.2	10.8	15.7	--	--
A4-50	**Tensile**	$N_{Rd,eq,C1}$	(kN)	2.6	3.5	5.3	7.7	--	--
	Shear	$V_{Rd,eq,C1}$	(kN)	2.6	4.4	6.2	11.5	--	--
A4-70	**Tensile**	$N_{Rd,eq,C1}$	(kN)	2.6	3.5	5.3	7.7	--	--
	Shear	$V_{Rd,eq,C1}$	(kN)	5.2	7.2	10.8	15.7	--	--

DESIGN RESISTANCE DRY/WET CONCRETE & FLOODED HOLES IN CASE OF SEISMIC PERFORMANCE CATEGORY C2

Cracked Concrete			D_a	M8	M10	M12	M16	M20	M24
Steel 8.8	**Tensile**	$N_{Rd,eq,C2}$	(kN)	--	--	1.7	3.3	--	--
	Shear	$V_{Rd,eq,C2}$	(kN)	--	--	3.5	6.8	--	--
A4-70	**Tensile**	$N_{Rd,eq,C2}$	(kN)	--	--	1.7	3.3	--	--
	Shear	$V_{Rd,eq,C2}$	(kN)	--	--	3.5	6.8	--	--

Combined Tension and Shear Loading Combined tension and shear loading in accordance with EN 1992-4:2018 and AS 5216. Please refer to ICCONS® DesignPRO software or contact ICCONS® engineering department at engineering@iccons.com.au for further information.

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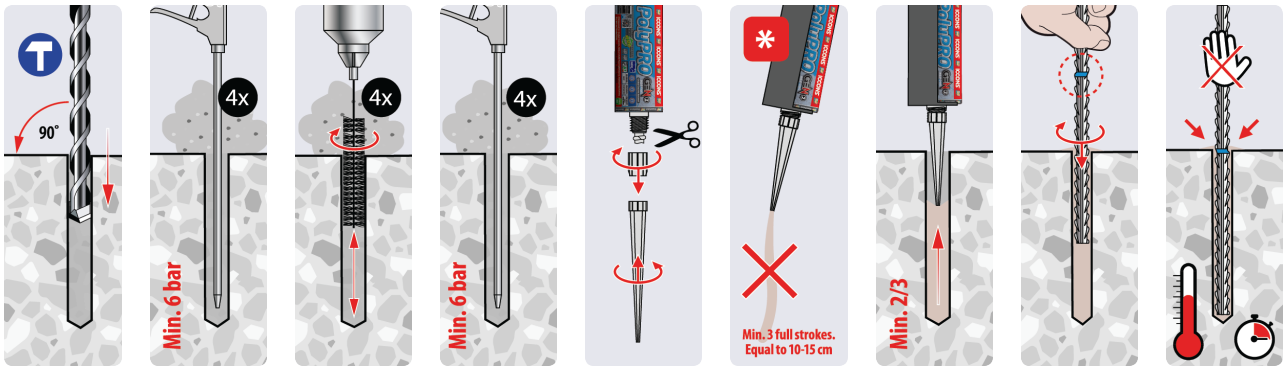
REINFORCING BARS

REBAR

EN 1992-1-1:2004+AC:2010, Annex C

- Bars are de-coiled rods class B or C
- f_{yk} and k according to NDP or NCL of EN 1992-1-1/NA
- $f_{uk} = f_{tk} = k \bullet f_{yk}$

INSTALLATION PROCEDURES



CURING TIMES[1]

Temperature[2]	-5°C to -1°C	0°C to +4°C	+5°C to +9°C	+10°C to +14°C	+15°C to +19°C	+20°C to +29°C	+30°C to +34°C	+35°C to +39°C
Working Time	90 min	45 min	25 min	20 min	15 min	6 min	4 min	2 min
Curing Time	6 h	3 h	2 h	100 min	80 min	45 min	25 min	20 min

[1] Cartridge Temperature must be between +5°C and +40°C.
[2] Concrete Temperature

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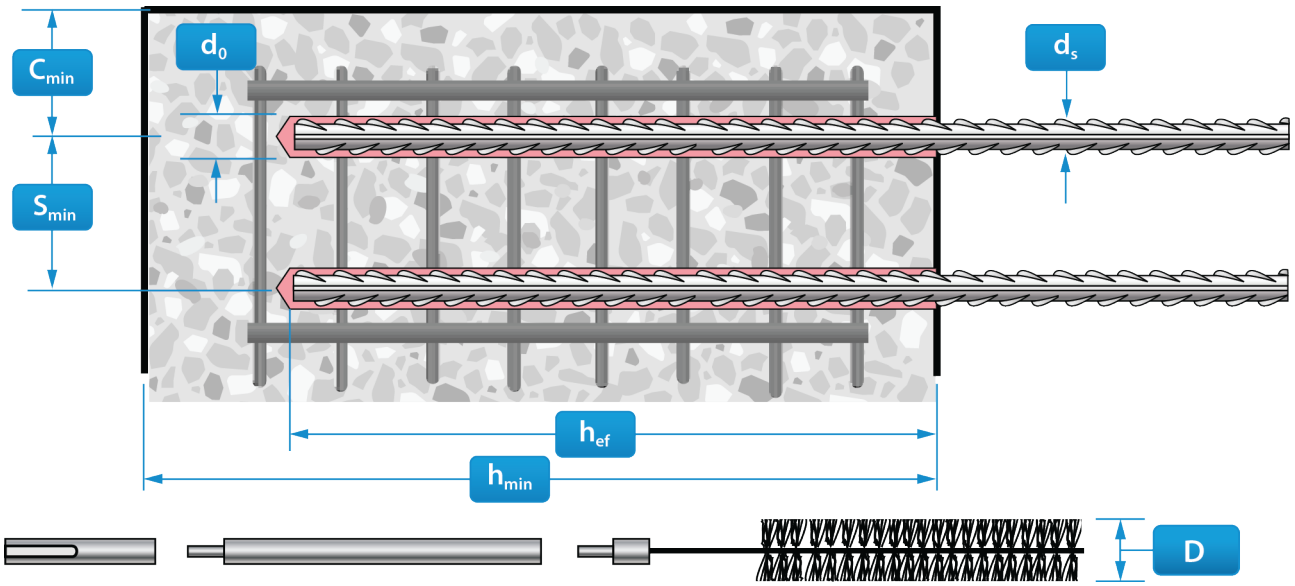
ETA - 25/0437

Specification Data for the use in Cracked and Non-Cracked Concrete and Hammer/Air Drilled Holes according to EAD 330499-02-0601 and AS 5216



INSTALLATION DIMENSIONS

Rebar Size	d_{nom}	Unit	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25
Min. Eff. Anchorage Depth	$h_{ef,min}$	(mm)	60	60	70	75	80	90	100
Max. Eff. Anchorage Depth	$h_{ef,max}$	(mm)	160	200	240	280	320	400	500
Hole Diameter	d_o	(mm)	12	14	16	18	20	25	32
Required Volume per cm Embedment Depth	V_s	(ml/cm)	0.75	0.9	1.06	1.21	1.36	2.12	3.76

MEMBER THICKNESS, EDGE DISTANCE & SPACING

Rebar Size	d_{nom}	Unit	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25
Min. Member Thickness	h_{min}	(mm)	hef + 30 mm ≥ 100 mm		$h_{ef} + 2d_0$				
Min. Edge Distance	c_{min}	(mm)	40	50	60	70	80	100	130
Min. Spacing	s_{min}	(mm)	40	50	60	70	80	100	130

STEEL BRUSH DIMENSIONS

Rebar Size	d_{nom}	Unit	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25
Brush Diameter	D	(mm)	14	16	18	20	22	27	34
Min. Brush Diameter	D_{min}	(mm)	12.5	14.5	16.5	18.5	20.5	25.5	32.5
Piston Plug	#	--	No piston plug required			18	20	25	32

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STATIC AND QUASI-STATIC RESISTANCE (FOR A SINGLE ANCHOR)

All data in this section subject to:

- Correct setting (see setting instructions).
- No edge distance and spacing influence.
- Minimum and maximum embedment depth, as specified in the 'Installation Dimensions' table.
- Concrete C20/25, f_{ck} = 20 N/mm².
- Temperature range I: (max. long/short term temperature +24°C / +40°C).
- Shear loads are calculated without the influence of a lever arm.
- Ψ_{SUS} = 1.0 according EN 1992-4:2018; eq. 7.1.4a.
- Recommended loads are with overall partial safety factor for action γ_G = 1.4. The partial safety factors for action depend on the type of loading and shall be taken from national regulations.

DESIGN RESISTANCE DRY/WET CONCRETE AND FLOODED HOLES

HD hammer

Non-Cracked Concrete			d_{nom}	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25
B500B	Tensile Min.	$N_{Rd,min}$	(kN)	5.9	7.3	10.3	12.8	14.5	20.4	27.3
	Tensile Max.	$N_{Rd,max}$	(kN)	15.6	24.4	35.2	47.9	58.1	90.8	141.8
	Shear Min.	$V_{Rd,min}$	(kN)	9.2	14.5	20.7	28.2	34.9	49	65.6
	Shear Max.	$V_{Rd,max}$	(kN)	9.2	14.5	20.7	28.2	36.9	57.6	90

RECOMMENDED LOADS DRY/WET CONCRETE AND FLOODED HOLES

HD hammer

Non-Cracked Concrete			d_{nom}	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25
B500B	Tensile Min.	$N_{rec,min}$	(kN)	4.2	5.2	7.3	9.2	10.4	14.6	19.5
	Tensile Max.	$N_{rec,max}$	(kN)	11.2	17.5	25.1	34.2	41.5	64.8	101.3
	Shear Min.	$V_{rec,min}$	(kN)	6.5	10.3	14.8	20.2	24.9	35	46.9
	Shear Max.	$V_{rec,max}$	(kN)	6.5	10.3	14.8	20.2	26.3	41.1	64.3

Combined Tension and Shear Loading Combined tension and shear loading in accordance with EN 1992-4:2018 and AS 5216. Please refer to ICCONS® DesignPRO software or contact ICCONS® engineering department at engineering@iccons.com.au for further information.

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BIS-P GEN2 MORTAR PROPERTIES

BIS-P GEN2 injection mortar may be applied in cracked and non-cracked concrete, lightweight-concrete, aerated-concrete and natural stone.

Attention! Natural stone can discolour; this shall be checked in advance. In the table below, the physical properties of the BIS-PE GEN2 are listed.

Properties	Test Method	Result
UV Resistance		Pass
Water tightness	DIN EN 12390-88	0 mm
Temperature stability		≤ 120 °C
Density		1.77 kg/dm³
Compressive strength	DIN EN 196-1	100 N/mm²
Flexural strength	DIN EN 196-1	15 N/mm²
E modulus	DIN EN ISO 527-2	14000 N/mm²
Shrinkage		≤ 0.3%
Hardness shore D		90
Electrical resistance	IEC 93	3.6 × 109 W m
Thermal conductivity	IEC 60093	0.65 W/m•K

BIS-P GEN2 CHEMICAL RESISTANCE

The resistance of the BIS-P GEN2 injection mortar to chemical substances is given in the table below.

The data in this table are applicable to brief periods of chemical contact with fully cured adhesive (e.g. temporary contact with adhesive during a spill).

Chemical Agent	Concentration	Resistant	Not Resistant
Acetone	10		✖
Beer		✔	
Diesel Oil		✔	
Ethanol	50		✖
Fuel Oil		✔	
Gasoline (premium grade)		✔	
Hydraulic Fluid		✔	
Hydrogen Peroxide	10		✖
Sea Water, Salty		✔	

DESIGN PRO
ADVANCED ANCHOR DESIGN SOFTWARE

AS5216 COMPLIANT NCC ANCHOR DESIGN

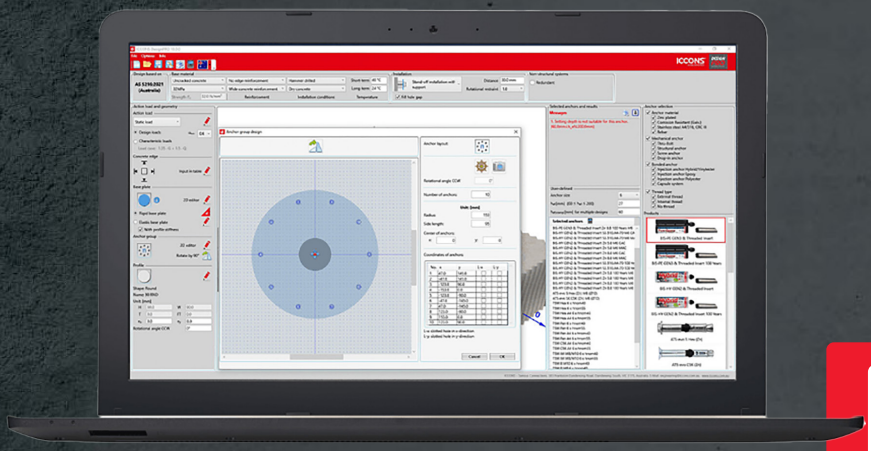
Design of fastenings under seismic actions

Design of redundant non-structural systems

Combined loading and displacement calculations

Unique all-in-one screen interface with easy data input and results display

- ✔ Interactive 3D model display for clear anchor and baseplate layout including rotation functionality
- ✔ Integrated FEA (Finite Element Analysis) for quick base plate thickness calculations
- ✔ Offers design solutions for rigid and elastic baseplates
- ✔ Flexible custom anchor and base plate geometry design for complex shapes and applications
- ✔ Utilises Australian steel profiles and material grades
- ✔ All product and all failure modes individually checked for precise anchor analysis and selection
- ✔ Summary or detailed design report options available to save or print



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