ICCONS®
Serious Connections

Epoxy

NEW! BIS-E EPOXY ADHESIVE

DONE AND DUSTLESS

NON TOXIC NO 100% SAFE BPA BISPHENOL A FREE

COMPLIES WITH AS 5216 FOR POST-INSTALLED FASTENINGS

ETA - 20/0783

ETA - 20/0784

NCC™ NATIONAL CODE COMPLIANT

LEED

TECHNICAL MANUAL

TDS 2026.1

BIS-E

B+BTec

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BIS

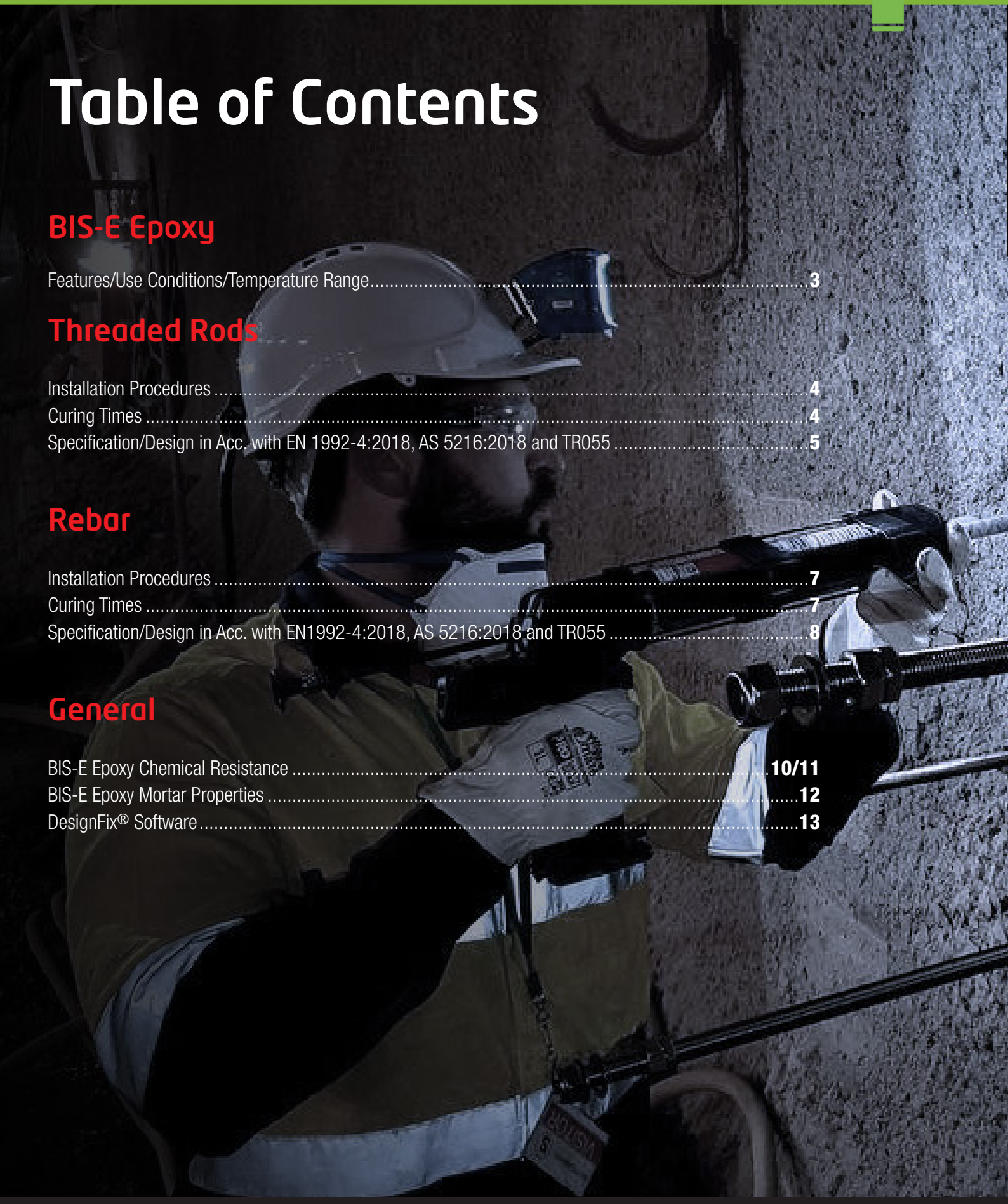


Table of Contents

Epoxy

ICCONS® Serious Connections

TDS 2026.1

BIS-E

Epoxy Injection Adhesive ETA Option 1 Assessed for Cracked & Non-Cracked Concrete

Threaded Rods/Rebar M8 - M30/Ø8 - 32 mm

RODS: Steel 5.8 and 8.8 Zinc Plated and Hot Dip Galvanized, Stainless Steel A4-50 and A4-70, High Corrosion Resistant Steel 1.4529
Rebar: EN 1992-1-1:2004 + AC:2010 Annex C

Features

- NEW! ETA Assessed for the Installation in Flooded Holes
- NEW! No Cleaning required for Hollow Drilling
- Slow Curing
- NEW! BPA Free
- Leed Tested
- ICCONS® DesignFix® support

Use Conditions

- Installation in Cracked & Non-Cracked Concrete C20/25 to C50/60
- For Anchor Rods M8-M30, Rebar Ø8-32 mm
- For Hammer/Air drilled Holes
- NEW! For Hollow Drilled Holes
- Installation in Dry and Wet Holes
- Installation in Flooded Holes
- Overhead Installation allowed.

Approvals & Test Reports

ETA - 20/0783

ETA - 20/0784

NCC NATIONAL CODE COMPLIANT

LEED

COMPLIES WITH AS 5216 FOR POST-INSTALLED FASTENINGS

DONE AND DUSTLESS

NON TOXIC NO 100% SAFE BPA BISPHENOL A FREE

Temperature Range

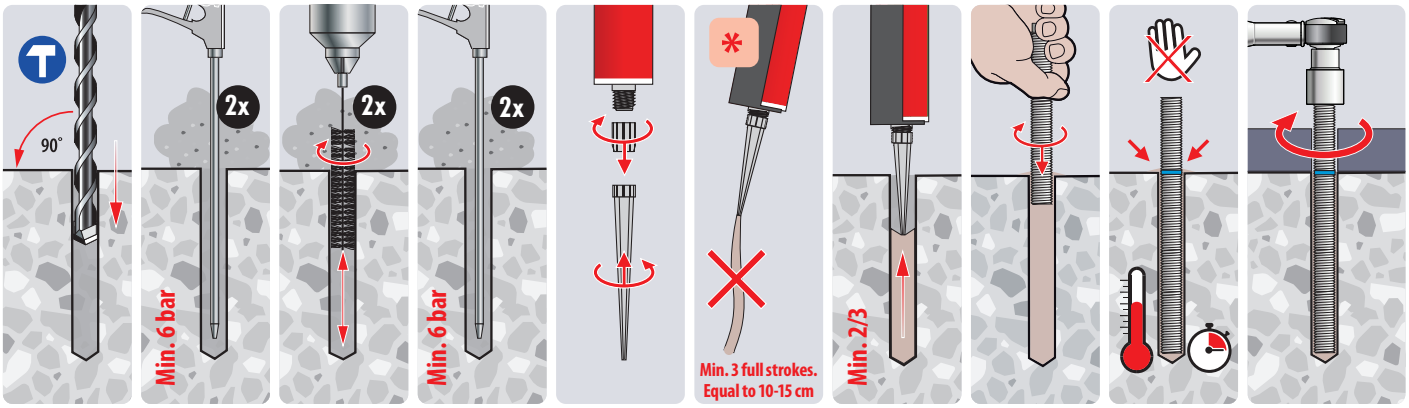
BIS-E injection mortar may be applied in the temperature ranges given below. An elevated base material temperature leads to a reduction of the bond resistance.

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.

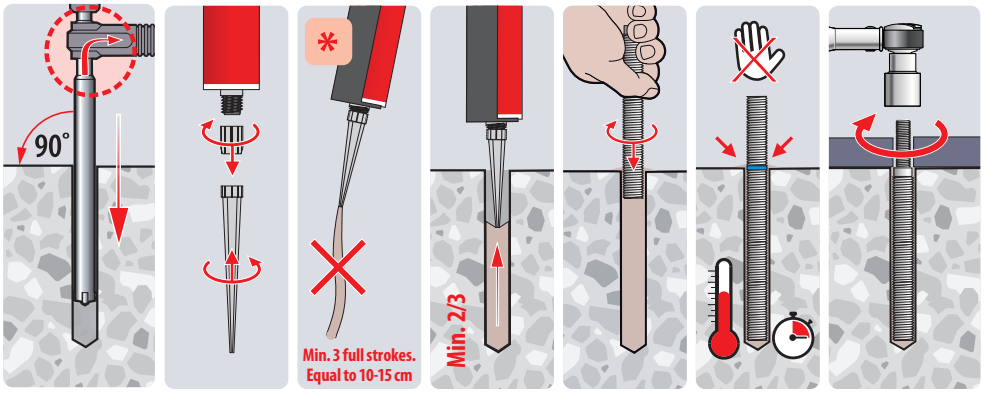
Temperature Range	Temperature Base Material	Max. Long Term Base Material Temperature	Max. Short Term Base Material Temperature
Temp. Range I	-40°C to +40°C	+24°C	+40°C
Temp. Range II	-40°C to +60°C	+35°C	+60°C
Temp. Range III	-40°C to +70°C	+43°C	+70°C

THREADED RODS

Installation Procedures (Hammer Drilling)



Installation Procedures (Hollow Drilling)



* Squeeze out separately a minimum of 3 full strokes (Equal to 10-15 cm) until the mortar shows a consistent colour.

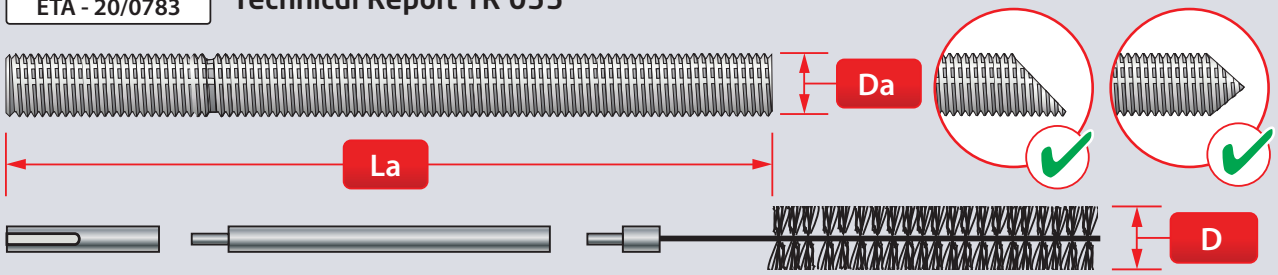
Curing Times[1)]

Temperature[2)] °C	+5 to +9	+10 to +14	+15 to +19	+20 to + 24	+25 to +34	+35 to +39	+40
Processing/Working Time	80 min	60 min	40 min	30 min	12 min	8 min	8 min
Curing Time Dry Holes	60 h	48 h	24 h	12 h	10 h	7 h	4 h
Curing Time Wet Holes	120 h	96 h	48 h	24 h	20 h	14 h	8 h

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

ETA - 20/0783

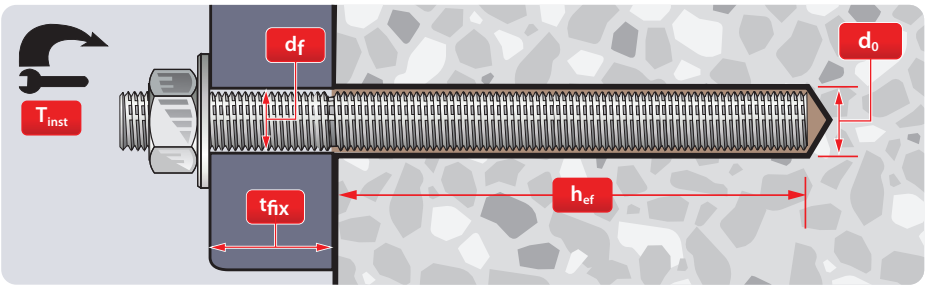
Specification Data for the use in Cracked & Uncracked Concrete according to EN 1992-4:2018, AS 5216:2018 and Technical Report TR 055

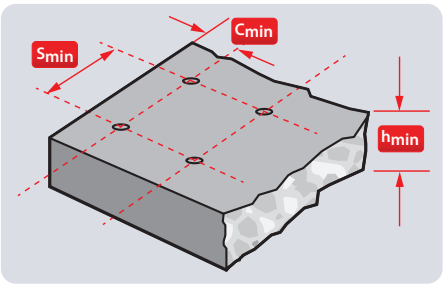


Installation Dimensions

Anchor Size	Da		M8	M10	M12	M16	M20	M24	M27	M30
Anchor Rod Length	L_a	[mm]	110	130	160	190	260	300	340	360
Min. Eff. Anchorage Depth	$h_{ef,min}$	[mm]	60	60	70	80	90	96	108	120
Max. Eff. Anchorage Depth	$h_{ef,max}$	[mm]	160	200	240	320	400	480	540	600
Anch. Depth for Calculation	$h_{ef,calc}$	[mm]	80	90	110	125	170	210	250	280
Hole Diameter	d_0	[mm]	10	12	14	18	22	28	30	35
Diameter Clearance Hole in the Fixture										
- Prepositioned Installation	d_f	[mm]	9	12	14	18	22	26	30	33
- Push through installation	d_f	[mm]	12	14	16	20	24	30	33	40
Max. Fixture Height	$t_{fix} \leq$	[mm]	20	30	35	45	70	65	70	50
Max. Torque Moment[1)]	$T_{inst} \leq$	[Nm]	10	20	40	60	100	170	250	300
Required Volume per cm Embedment Depth	V_s	[ml/cm]	0,44	0,59	0,75	1,09	1,53	2,87	3,72	4,37

1) Max. Recommended torque moment to avoid splitting failure during installation with minimum spacing and edge distance





Member Thickness, Edge Distance & Spacing

Anchor Size	Da		M8	M10	M12	M16	M20	M24	M27	M30
Min. Member Thickness	h_{min}	[mm]	h_{ef} + 30 mm ≥100 mm			h_{ef} + $2d_0$				
Min. Edge Distance	C_{min}	[mm]	35	40	45	50	60	65	75	80
Min. Spacing	S_{min}	[mm]	40	50	60	75	95	115	125	140

Steel Brush Dimensions

Anchor Size	Da		M8	M10	M12	M16	M20	M24	M27	M30
Brush Diameter	D	[mm]	11,5	13,5	15,5	20	24	30	31,8	37
Min. Brush Diameter	D_{min}	[mm]	10,5	12,5	14,5	18,5	22,5	28,5	30,5	35,5
Piston Plug	#	[-]	No piston plug required			18	22	28	30	35

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 EN 1992-4:2018; eq. 7.14a and AS 5216:2018; eq 6.2.5.2(a)

Design Resistance Dry/Wet and Flooded Holes (Hammer Drilled & Hollow Drilling)

Steel Decisive

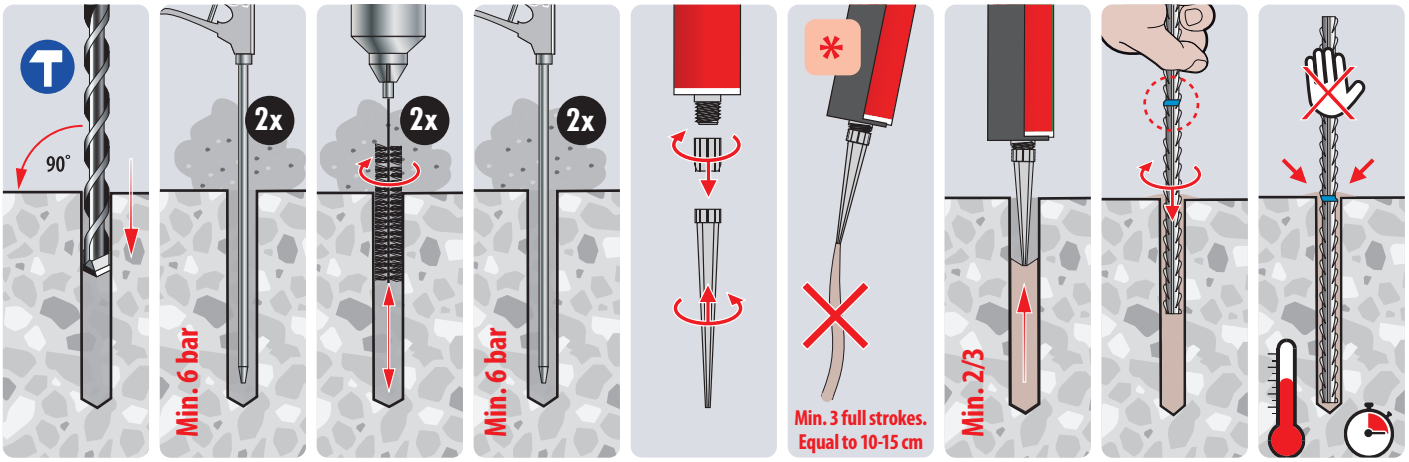
Non-Cracked Concrete		Da		M8	M10	M12	M16	M20	M24
Steel 5.8	Tensile	N_{Rd}	[kN]	12.0	19.3	27.0	32.7	51.9	71.3
	Shear	V_{Rd}	[kN]	8.8	13.6	20.0	37.6	59.2	84.8
Steel 8.8	Tensile	N_{Rd}	[kN]	14.4	20.0	27.0	32.7	51.9	71.3
	Shear	V_{Rd}	[kN]	12.0	18.4	27.2	50.4	78.4	112.8
A4-70	Tensile	N_{Rd}	[kN]	13.9	20.0	27.0	32.7	51.9	71.3
	Shear	V_{Rd}	[kN]	8.3	12.8	19.2	35.3	55.1	79.5

Cracked Concrete		Da		M8	M10	M12	M16	M20	M24
Steel 5.8	Tensile	N_{Rd}	[kN]	6.7	9.4	13.8	20.9	35.6	45.2
	Shear	V_{Rd}	[kN]	8.8	13.6	20.0	37.6	59.2	84.8
Steel 8.8	Tensile	N_{Rd}	[kN]	6.7	9.4	13.8	20.9	35.6	45.2
	Shear	V_{Rd}	[kN]	12.0	18.4	27.2	50.4	78.4	112.8
A4-70	Tensile	N_{Rd}	[kN]	6.7	9.4	13.8	20.9	35.6	45.2
	Shear	V_{Rd}	[kN]	8.3	12.8	19.2	35.3	55.1	79.5

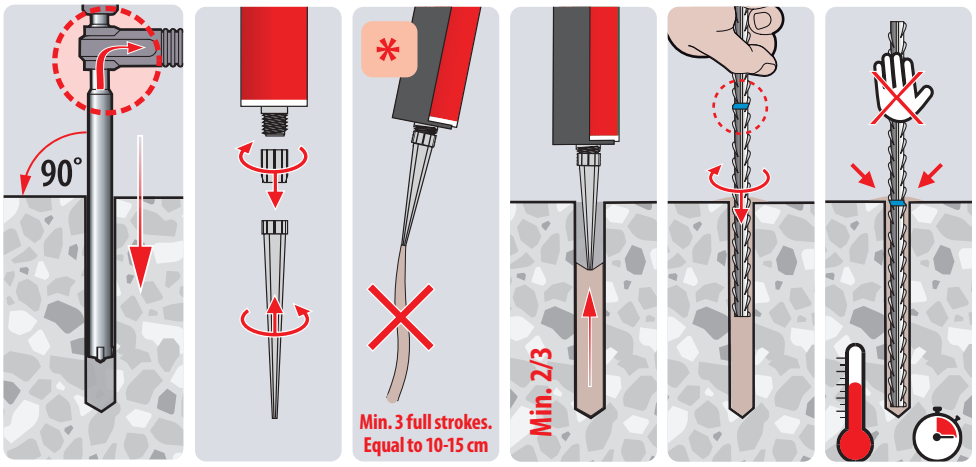
Combined tension and shear loading in accordance with EN 1992-4:2018 and AS 5216:2018 please refer to ICCONS® Designfix software or contact ICCONS® engineering department **engineering@iccons.com.au** for further information.

REINFORCING BARS

Installation Procedures (Hammer Drilling)



Installation Procedures (Hollow Drilling)



* Squeeze out separately a minimum of 3 full strokes (Equal to 10-15 cm) until the mortar shows a consistent colour.

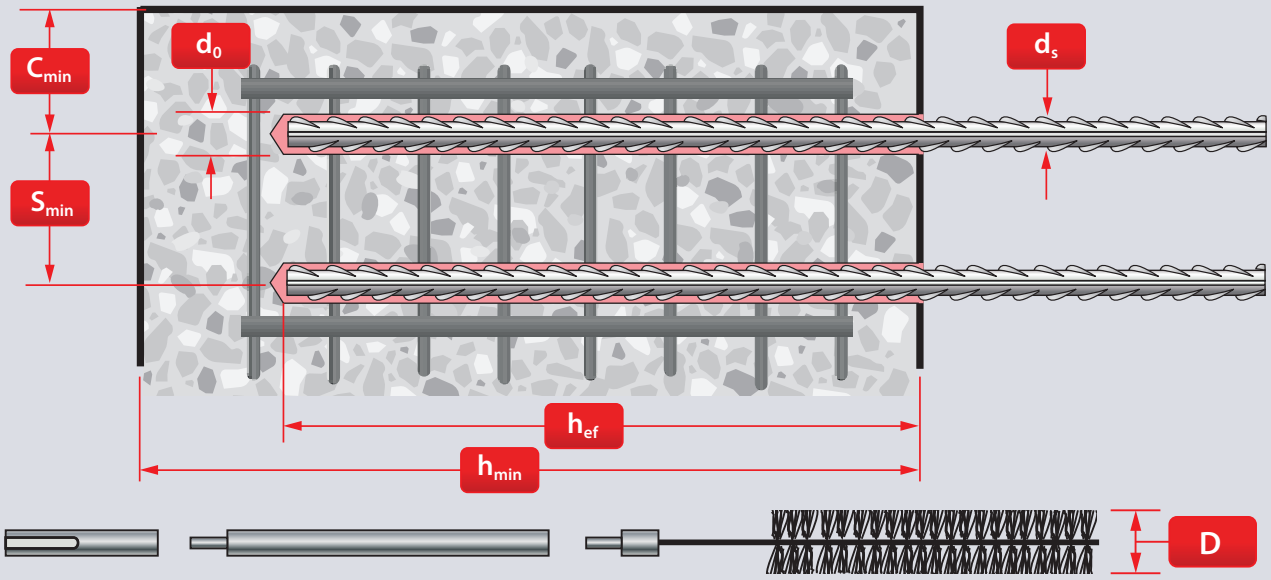
Curing Times[1)]

Temperature[2)] °C	+5 to +9	+10 to +14	+15 to +19	+20 to + 24	+25 to +34	+35 to +39	+40
Processing/Working Time	80 min	60 min	40 min	30 min	12 min	8 min	8 min
Curing Time Dry Holes	60 h	48 h	24 h	12 h	10 h	7 h	4 h
Curing Time Wet Holes	120 h	96 h	48 h	24 h	20 h	14 h	8 h

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

ETA - 20/0783

Specification Data for the use in Cracked & Uncracked Concrete according to EN 1992-4:2018, AS 5216:2018 and Technical Report TR 055



Installation Dimensions

Rebar Size	d_{nom}		Ø12	Ø16	Ø20	Ø24	Ø28	Ø32
Min. Eff. Anchorage Depth	$h_{ef,min}$	[mm]	70	80	90	96	112	128
Max. Eff. Anchorage Depth	$h_{ef,max}$	[mm]	240	320	400	480	560	640
Hole Diameter	d_0	[mm]	16	20	25	32	35	40
Required Volume per cm Embedment Depth	V_s	[ml/cm]	1,06	1,36	2,12	4,22	4,16	5,43

Member Thickness, Edge Distance & Spacing

Rebar Size	d_{nom}		Ø12	Ø16	Ø20	Ø24	Ø28	Ø32
Min. Member Thickness	h_{min}	[mm]	$h_{ef} + 2d_0$					
Min. Edge Distance	C_{min}	[mm]	45	50	60	70	75	85
Min. Spacing	S_{min}	[mm]	60	75	95	120	130	150

Steel Brush & Piston Plug Dimensions

Rebar Size	d_{nom}		Ø12	Ø16	Ø20	Ø24	Ø28	Ø32
Brush Diameter	D	[mm]	18,0	22,0	27,0	34,0	37,0	44,0
Min. Brush Diameter	D_{min}	[mm]	16,5	20,5	25,5	32,5	35,5	40,5
Piston Plug	#	--		20	25	32	35	40

Static and quasi-static resistance (for a single rebar)

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. 7.14a and AS 5216:2018; eq 6.2.5.2(a)

HD HAMMER HD B HAMMER

Design Resistance Dry/Wet and Flooded Holes (Hammer Drilled & Hollow Drilling)

Steel Decisive

Non-Cracked Concrete		d_{nom}		Ø12	Ø16	Ø20	Ø24	Ø28	Ø32
B500B	Tensile Min.	$N_{Rd,min}$	[kN]	13.7	16.8	20.0	22.0	27.8	33.9
	Tensile Max.	$N_{Rd,max}$	[kN]	44.3	79.3	123.6	177.9	242.1	315.7
	Shear Min.	$V_{Rd,min}$	[kN]	20.7	36.7	56.0	61.7	77.8	95.0
	Shear Max.	$V_{Rd,max}$	[kN]	20.7	36.7	57.3	82.7	112.7	147.3

Cracked Concrete		d_{nom}		Ø12	Ø16	Ø20	Ø24	Ø28	Ø32
B500B	Tensile Min.	$N_{Rd,min}$	[kN]	8.8	11.7	14.0	15.4	19.4	23.8
	Tensile Max.	$N_{Rd,max}$	[kN]	30.2	49.8	71.8	103.4	129.0	168.5
	Shear Min.	$V_{Rd,min}$	[kN]	20.7	32.9	39.2	43.2	54.4	66.5
	Shear Max.	$V_{Rd,max}$	[kN]	20.7	36.7	57.3	82.7	112.7	147.3

Combined tension and shear loading in accordance with EN 1992-4:2018 and AS 5216:2018 please refer to ICCONS® Designfix software or contact ICCONS® engineering department **engineering@iccons.com.au** for further information.

BIS-E Chemical Resistance

The resistance of the BIS-E 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 full cured adhesive (e.g. Temporary contact with adhesive during a spill).

Chemical Agent	Concentration	Resistant	Not resistant
Accumulator acid			
Acetic acid	10%		
Acetic acid	40%		✘
Laitance		✔	
Acetone	5%		
Acetone	10%		✘
Acetone	100%		
Ammonia, aqueous solution	5%	✔	
Ammonia, aqueous solution	32%		
Aniline	100%		✘
Beer	100%	✔	
Chlorine	ALL	✔	
Benzol	100%		✘
Boric Acid, aqueous solution		✔	
Calcium carbonate, suspended in water	ALL	✔	
Calcium chloride, suspended in water		✔	
Calcium hydroxide, suspended in water		✔	
Chlorinated lime (Calcium hypochlorite)	10%		
Carbon tetrachloride	100%	✔	
Caustic soda solution	10%	✔	
Caustic soda solution	40%	✔	
Citric acid	10%		
Citric acid	50%		
Citric acid	ALL	✔	
Chlorine water, swimming pool	ALL		
Demineralized water	ALL		
Diesel oil	100%	✔	
Ethyl alcohol, aqueous solution	100%		
Ethyl alcohol, aqueous solution	50%		✘
Formic acid	10%	✔	
Formic acid	30%		
Formic acid	100%		✘
Formaldehyde, aqueous solution	20%	✔	
Formaldehyde, aqueous solution	30%	✔	
Freon		✔	

Results shown in the table are applicable to brief periods of chemical contact with full cured adhesive (e.g. temporary contact with adhesive during a spill).

Chemical Agent	Concentration	Resistant	Not resistant
Fuel Oil		✔	
Gasoline (premium grade)	100%	✔	
Glycol (Ethylene glycol)		✔	
Hydraulic fluid	Conc.		
Hydrochloric acid (Muriatic Acid)	Conc.		✘
Hydrogen peroxide	10%		
Hydrogen peroxide	30%		✘
Isopropyl alcohol	100%		✘
Lactic acid	10%		
Lactic acid	All		✘
Linseed oil	100%	✔	
Lubricating oil	100%	✔	
Magnesium chloride, aqueous solution	All	✔	
Methanol	100%		✘
Standard benzine			
Motor oil (SAE 20 W-50)	100%	✔	
Nitric acid	10%		✘
Oleic acid	100%	✔	
Perchloroethylene	100%	✔	
Petroleum	100%	✔	
Phenol, aqueous solution	8%		✘
Benzyl Alcohol	100%		
Phosphoric acid	85%	✔	
Phosphoric acid	10%	✔	
Potash lye (Potassium hydroxide)	10%	✔	
Potash lye (Potassium hydroxide)	40%	✔	
Potassium carbonate, aqueous solution	All	✔	
Potassium chlorite, aqueous solution	All	✔	
Potassium nitrate, aqueous solution	All	✔	
Sea water, salty	All		
Sodium carbonate	All	✔	
Sodium chloride, aqueous solution	All	✔	
Sodium phosphate, aqueous solution	All	✔	
Sodium silicate	All	✔	
Sulfuric acid	10%		
Sulfuric acid	30%		✘
Sulfuric acid	70%		✘
Tartaric acid	All	✔	
Tetrachloroethylene	100%	✔	
Toluene			✘
Trichloroethylene	100%		✘
Turpentine	100%	✔	

Results shown in the table are applicable to brief periods of chemical contact with full cured adhesive (e.g. temporary contact with adhesive during a spill).

BIS-E Mortar Properties

BIS-E 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-E are listed.

Properties	Test Method	Result
UV resistance	-	Pass
Watertightness	DIN EN 12390-8	0 mm
Density	-	1,5 kg / dm³
Compressive strength	EN 196 Teil1	122 N / mm²
Flexural strength	EN 196 Teil1	66 N / mm²
Axial tensile strength	DIN EN ISO 527-2	44 N / mm²
E modulus	DIN EN ISO 527-2	6300 N / mm²
Shrinkage	DIN 52450	< 1,4 %
Hardness Shore A	DIN EN ISO 868	99,4
Hardness Shore D	DIN EN ISO 868	86,1
Electrical resistance	IEC 93	8,0 * 10^{12} Ω
Thermal conductivity	DIN EN 993-15	0,5 W / m·K
Spec. Heat capacity	DIN EN 993-15	1350 J / kg · K

Anchoring

Adhesive

PURE EPOXY GEN 3

ICCONS®

Design FiX

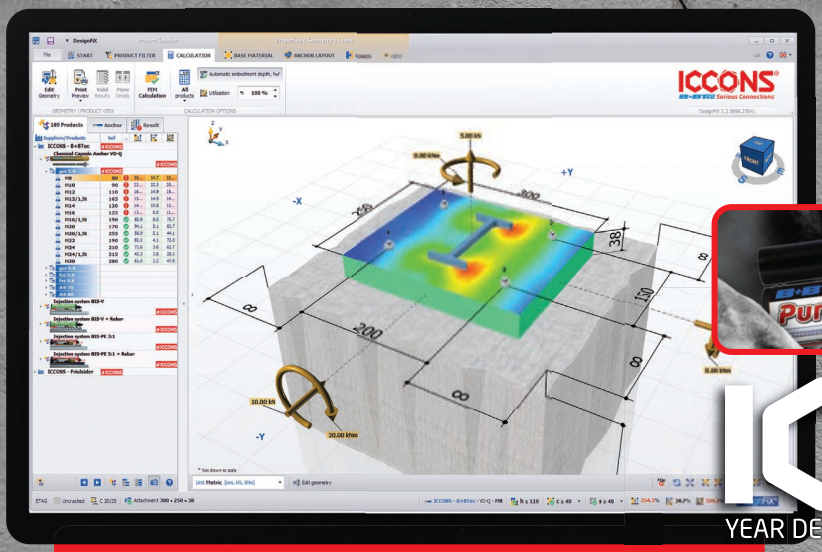
DESIGNFIX®

anchor design made easy

- An innovative 3D visual user interface, utilizing EN 1992-4 design methodology and suitable for design in accordance with AS 5216:2018
- Seismic design under earthquake loads according to EN 1992-4, TR 045, TR 049
- Finite element analysis steel baseplate design

ICCONS DesignFiX® is a simple, intuitive and free to download (registration required) anchor design program for design engineers, project managers, site engineers and end users. Complex mechanical or chemical heavy duty anchor arrangements can be calculated in minutes.

INCLUDES THE NEW BIS PE GEN3 PURE EPOXY WITH 100 year design service life assessed in accordance with EAD 330499-01-0601



100+ YEAR DESIGN LIFE

FREE DOWNLOAD www.iccons.com.au/software/anchor-design-software

Optimum BIS Injection System anchorage depth

When selecting a BIS Adhesive Injection System, ICCONS DesignFiX allows for the automatic calculation of the most effective anchorage depth, taking into consideration the minimal and maximum values of the ETA.

Input freedom & 3D user interface

ICCONS DesignFiX offers complete freedom to select an anchor pattern and base plate configuration, as well as the position and direction of load combinations. Changes are made directly into the 3D user interface.

Anchor type comparison

ICCONS DesignFiX displays the usability of the various anchor types (according to EN 1992-4) including the values for each load type. This allows you to compare the calculation results of the different anchor types in a single easy to read panel. Design results suitable for use in accordance with AS 5216:2018.

Calculate base plate thickness

The integrated FEM-Calculation Method (Finite Element Method) in ICCONS DesignFiX allows you to calculate the base plate thickness based upon the stresses in the base plate in combination with the base plate configuration.

NCC™ NATIONAL CODE COMPLIANT

ETA

C1 SEISMIC

C2 SEISMIC

DONE AND DUSTLESS

AEFAC Australian Engineered Fasteners and Anchors Council SUPPORTING MEMBER

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