ICCONS®
Serious Connections

# Pure-Epoxy GEN 3

NEW! NEXT GENERATION PURE-EPOXY ADHESIVES


100+ YEAR DESIGN LIFE

DONE AND DUSTLESS

ETA - 19/0850

NCC NATIONAL CODE COMPLIANT

C1 SEISMIC

C2 SEISMIC

F120

POTABLE WATER APPROVED

LEED

ÉMISSIONS DANS L'AIR INTÉRIEUR A+

COMPLIES WITH AS 5216 FOR POST-INSTALLED FASTENINGS

# TECHNICAL MANUAL

TDS 2021.3

BIS-PE GEN3

B+BTec

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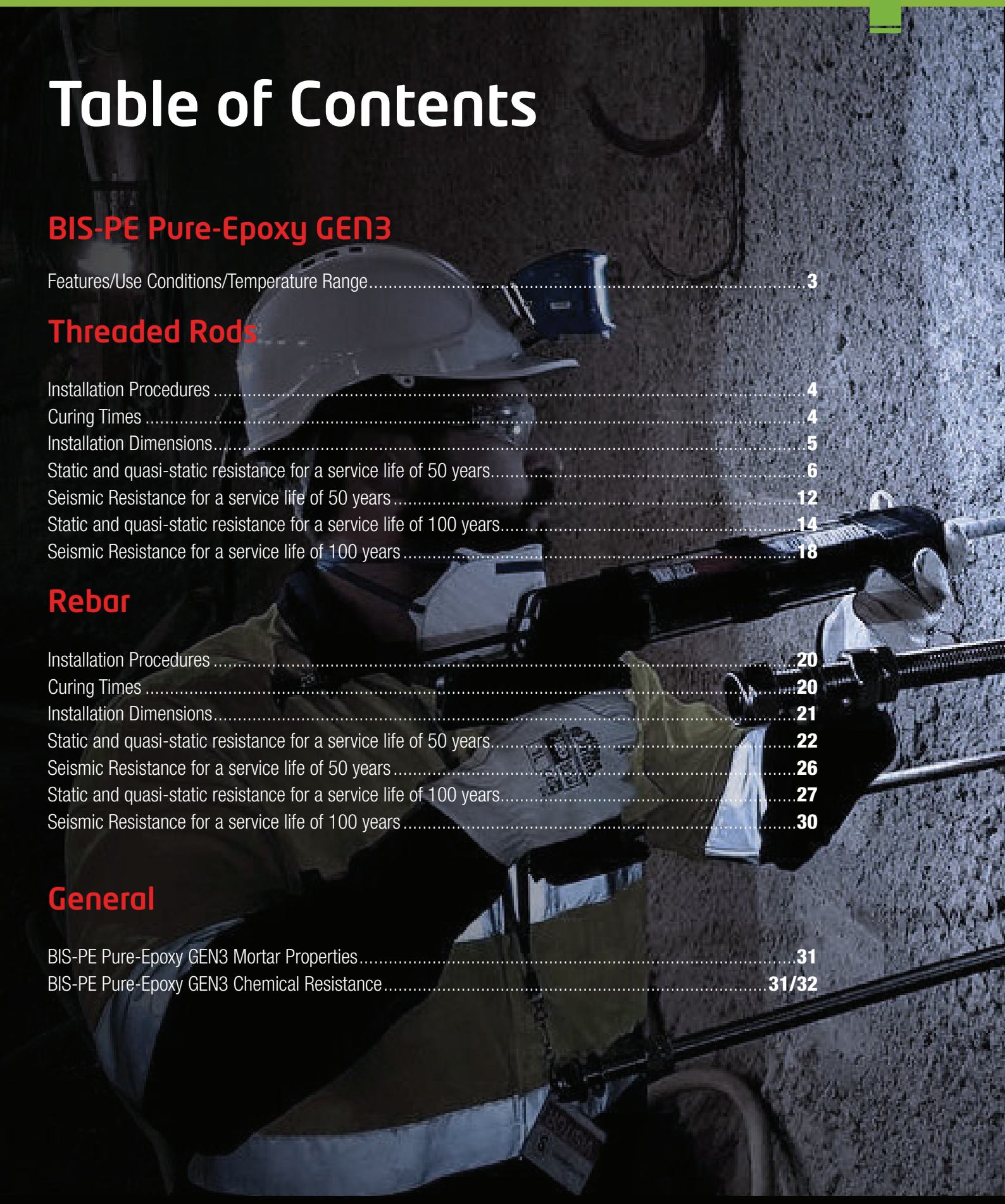
BIS



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## BIS-PE Pure-Epoxy GEN3



## Threaded Rods

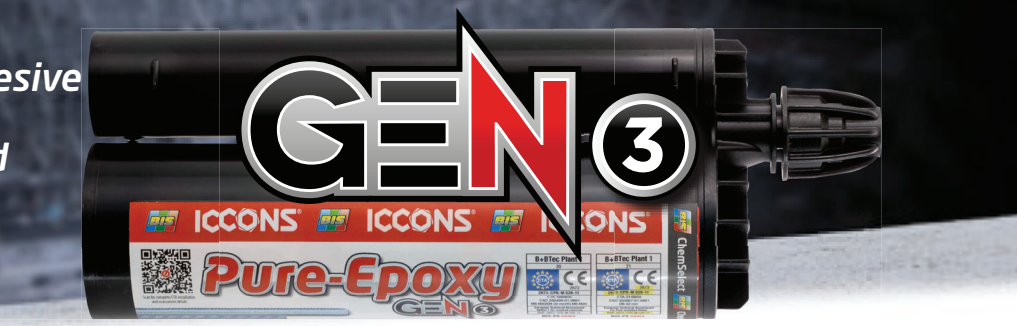


## Rebar

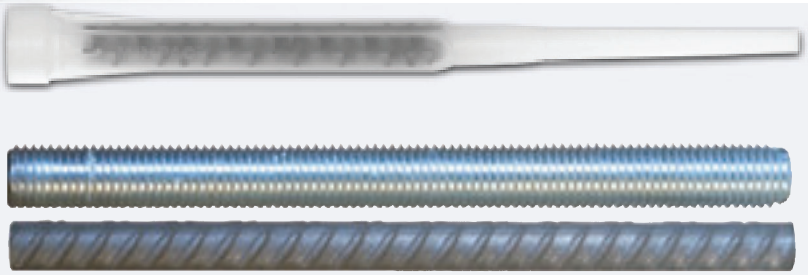


## General

*Pure-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
- NEW! Extended Seismic C2 Range: M12 - M24
- NEW! Significantly Higher Loads especially @ Higher Temperatures
- NEW! 100 Year Design Life
- NEW! Increased Embedment Depths
- Slow Curing
- Low VOC: A+ Rating
- Fire Rated
- Leed Tested
- Potable Water Approved
- B+BTec DesignFix® support

## Use Conditions

- Installation in Cracked & Non-Cracked Concrete C20/25 to C50/60
- For Anchor Rods M8-M30, Rebar Ø8-32 mm and Threaded Sleeves M6-M20
- Seismic Action C1: M8-M30, Ø8-32 mm
- Seismic Action C2: M12 - M24
- For Hammer/Air drilled Holes
- NEW! For Hollow Drilled Holes
- NEW! For Diamond Drilled Holes
- Installation in Dry and Wet Holes
- Installation in Flooded Holes
- Overhead Installation allowed.

## Approvals & Test Reports

ETA - 19/0850
NCC NATIONAL CODE COMPLIANT
C1 SEISMIC
C2 SEISMIC
F120
POTABLE WATER APPROVED
LEED
ÉMISSIONS DANS L'AIR INTÉRIEUR A+
AS 5216 COMPLIES WITH FOR POST-INSTALLED FASTENINGS
100+ YEAR DESIGN LIFE
DONE AND DUSTLESS

## Temperature Range

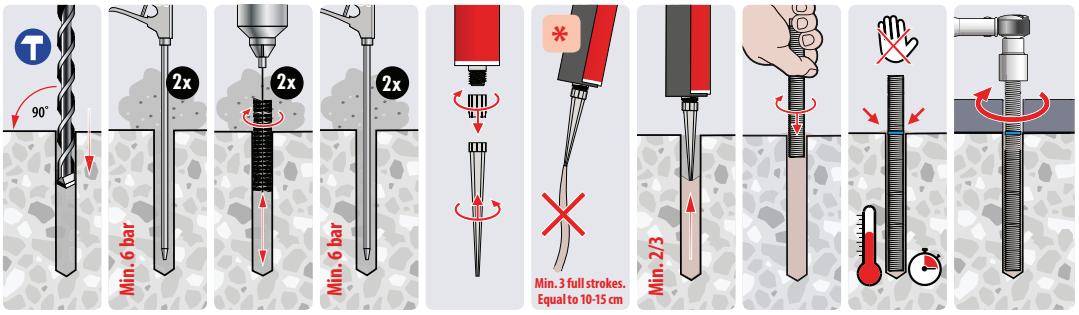
B+BTec BIS-PE GEN3 injection mortar may be applied in the temperature ranges given below. An elevated base material temperature leads to a reduction of the bond resistance.

**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.

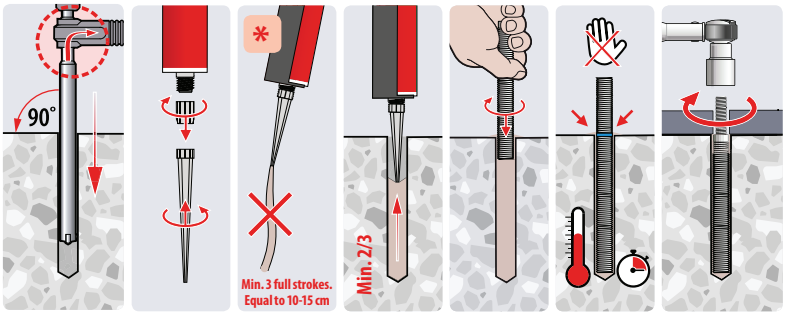
| Temperature Range | Temperature Base Material | Max. Long Term Base Material Temperature | Max. Short Term Base Material Temperature |
|---|---|---|---|
| Temp. Range I | -40°C to +40°C | +24°C | +40°C |
| Temp. Range II | -40°C to +72°C | +50°C | +72°C |

# THREADED RODS

## Installation Procedures (Hammer Drilling)

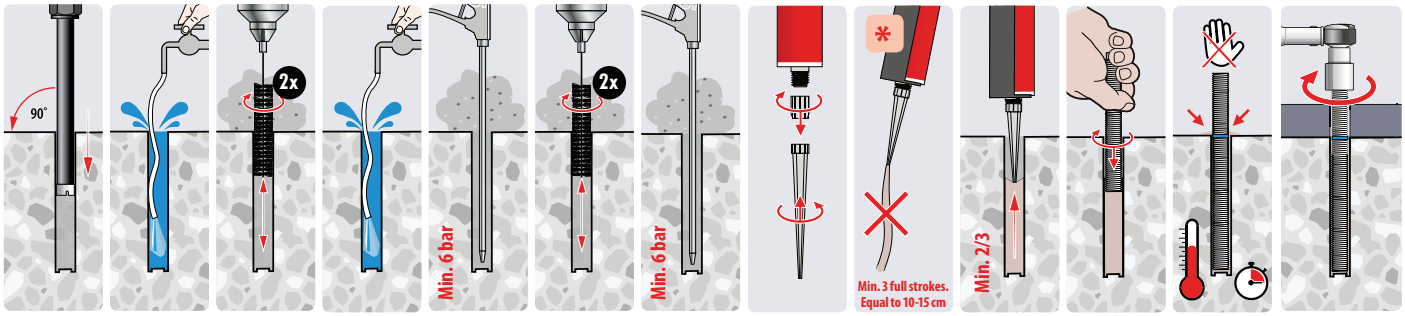



## Installation Procedures (Hollow Drilling)




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

## Installation Procedures (Diamond Drilling)



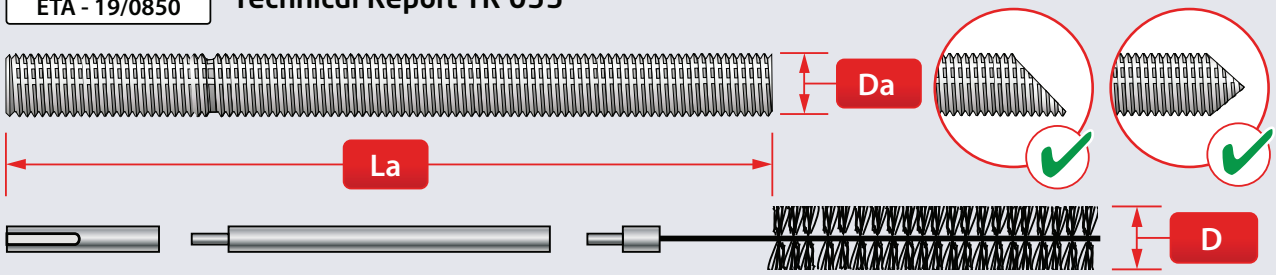

## Curing Times[1)]

| 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 | 48 h | 28 h | 18 h | 12 h | 9 h | 6 h | 4 h |
| Curing Time Wet Holes | 96 h | 56 h | 36 h | 24 h | 18 h | 12 h | 8 h |

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

ETA - 19/0850

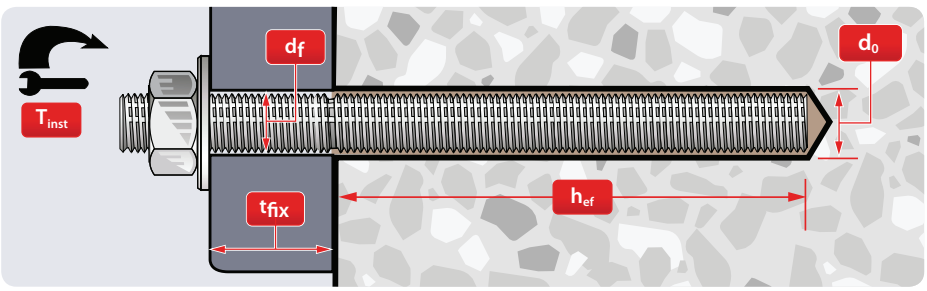
## Specification Data for the use in Cracked & Uncracked Concrete according to EN 1992-4:2018, AS 5216 and Technical Report TR 055

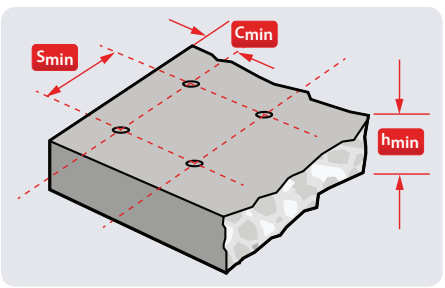



## Installation Dimensions

| 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[1] | | | | | | | | | | |
| - 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[2] | $T_{inst} \leq$ | [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) For application under seismic loading the diameter of clearance hole in the fixture shall be at maximum d + 1mm or alternatively the annular gap between fixture and anchor rod shall be filled force-fit with mortar. 2) 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 service life of 50 years (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.
- $\psi_{sus}$ = 1,0 according EN 1992-4:2018; eq. 7.14a.
- Recommended loads are with overal partial safety factor for action $\gamma_G$ = 1,4. The partial safety factors for action depend on the type of loading and shall be taken from national regulations.

HD HAMMER

## Design Resistance Dry/Wet Holes (Hammer Drilled)

Steel Decisive

| Non-Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{Rd}$ | [kN] | 12,0 | 19,3 | 28,0 | 45,8 | 72,7 | 99,8 | 129,6 | 153,7 |
| | Shear | $V_{Rd}$ | [kN] | 8,8 | 13,6 | 20,0 | 37,6 | 59,2 | 84,8 | 110,4 | 134,4 |
| Steel 8.8 | Tensile | $N_{Rd}$ | [kN] | 19,3 | 28,0 | 37,8 | 45,8 | 72,7 | 99,8 | 129,6 | 153,7 |
| | Shear | $V_{Rd}$ | [kN] | 12,0 | 18,4 | 27,2 | 50,4 | 78,4 | 112,8 | 147,2 | 179,2 |
| A4-50 | Tensile | $N_{Rd}$ | [kN] | 6,3 | 10,1 | 14,7 | 27,6 | 43,0 | 61,9 | 80,4 | 98,3 |
| | Shear | $V_{Rd}$ | [kN] | 3,8 | 6,3 | 8,8 | 16,4 | 25,6 | 37,0 | 48,3 | 58,8 |
| A4-70 | Tensile | $N_{Rd}$ | [kN] | 13,9 | 21,9 | 31,6 | 45,8 | 72,7 | 99,8 | - | - |
| | 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 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{Rd}$ | [kN] | 9,4 | 13,2 | 23,5 | 32,1 | 50,9 | 69,9 | 90,7 | 107,6 |
| | Shear | $V_{Rd}$ | [kN] | 8,8 | 13,6 | 20,0 | 37,6 | 59,2 | 84,8 | 110,4 | 134,4 |
| Steel 8.8 | Tensile | $N_{Rd}$ | [kN] | 9,4 | 13,2 | 23,5 | 32,1 | 50,9 | 69,9 | 90,7 | 107,6 |
| | Shear | $V_{Rd}$ | [kN] | 12,0 | 18,4 | 27,2 | 50,4 | 78,4 | 112,8 | 147,2 | 179,2 |
| A4-50 | Tensile | $N_{Rd}$ | [kN] | 6,3 | 10,1 | 14,7 | 27,6 | 43,0 | 61,9 | 80,4 | 98,3 |
| | Shear | $V_{Rd}$ | [kN] | 3,8 | 6,3 | 8,8 | 16,4 | 25,6 | 37,0 | 48,3 | 58,8 |
| A4-70 | Tensile | $N_{Rd}$ | [kN] | 9,4 | 13,2 | 23,5 | 32,1 | 50,9 | 69,9 | - | - |
| | 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 please refer to ICCONS DesignPRO software or contact Iccons engineering department **engineering@iccons.com.au** for further information.

## Design Resistance Flooded Holes (Hammer Drilled)

Steel Decisive

| Non-Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{Rd}$ | [kN] | 12,0 | 19,3 | 28,0 | 38,2 | 60,6 | 83,2 | 108,0 | 128,0 |
| | Shear | $V_{Rd}$ | [kN] | 8,8 | 13,6 | 20,0 | 37,6 | 59,2 | 84,8 | 110,4 | 134,4 |
| Steel 8.8 | Tensile | $N_{Rd}$ | [kN] | 19,3 | 23,3 | 31,5 | 38,2 | 60,6 | 83,2 | 108,0 | 128,0 |
| | Shear | $V_{Rd}$ | [kN] | 12,0 | 18,4 | 27,2 | 50,4 | 78,4 | 112,8 | 147,2 | 179,2 |
| A4-50 | Tensile | $N_{Rd}$ | [kN] | 6,3 | 10,1 | 14,7 | 27,6 | 43,0 | 61,9 | 80,4 | 98,3 |
| | Shear | $V_{Rd}$ | [kN] | 3,8 | 6,3 | 8,8 | 16,4 | 25,6 | 37,0 | 48,3 | 58,8 |
| A4-70 | Tensile | $N_{Rd}$ | [kN] | 13,9 | 21,9 | 31,5 | 38,2 | 60,6 | 83,2 | - | - |
| | 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 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{Rd}$ | [kN] | 7,8 | 11,0 | 19,6 | 26,7 | 42,4 | 58,2 | 75,6 | 89,6 |
| | Shear | $V_{Rd}$ | [kN] | 8,8 | 13,6 | 20,0 | 37,6 | 59,2 | 84,8 | 110,4 | 134,4 |
| Steel 8.8 | Tensile | $N_{Rd}$ | [kN] | 7,8 | 11,0 | 19,6 | 26,7 | 42,4 | 58,2 | 75,6 | 89,6 |
| | Shear | $V_{Rd}$ | [kN] | 12,0 | 18,4 | 27,2 | 50,4 | 78,4 | 112,8 | 147,2 | 179,2 |
| A4-50 | Tensile | $N_{Rd}$ | [kN] | 6,3 | 10,1 | 14,7 | 26,7 | 42,4 | 58,2 | 75,6 | 89,6 |
| | Shear | $V_{Rd}$ | [kN] | 3,8 | 6,3 | 8,8 | 16,4 | 25,6 | 37,0 | 48,3 | 58,8 |
| A4-70 | Tensile | $N_{Rd}$ | [kN] | 7,8 | 11,0 | 19,6 | 26,7 | 42,4 | 58,2 | - | - |
| | Shear | $V_{Rd}$ | [kN] | 8,3 | 12,8 | 19,2 | 35,3 | 55,1 | 79,5 | - | - |

## Recommended Loads Dry/Wet Holes (Hammer Drilled)

| Non-Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{rec}$ | [kN] | 8,6 | 13,8 | 20,0 | 32,7 | 51,9 | 71,3 | 92,6 | 109,8 |
| | Shear | $V_{rec}$ | [kN] | 6,3 | 9,7 | 14,3 | 26,9 | 42,3 | 60,6 | 78,9 | 96,0 |
| Steel 8.8 | Tensile | $N_{rec}$ | [kN] | 13,8 | 20,0 | 27,0 | 32,7 | 51,9 | 71,3 | 92,6 | 109,8 |
| | Shear | $V_{rec}$ | [kN] | 8,6 | 13,1 | 19,4 | 36,0 | 56,0 | 80,6 | 105,1 | 128,0 |
| A4-50 | Tensile | $N_{rec}$ | [kN] | 4,5 | 7,2 | 10,5 | 19,7 | 30,7 | 44,2 | 57,4 | 70,2 |
| | Shear | $V_{rec}$ | [kN] | 2,7 | 4,5 | 6,3 | 11,7 | 18,3 | 26,4 | 34,5 | 42,0 |
| A4-70 | Tensile | $N_{rec}$ | [kN] | 9,9 | 15,7 | 22,5 | 32,7 | 51,9 | 71,3 | - | - |
| | Shear | $V_{rec}$ | [kN] | 6,0 | 9,2 | 13,7 | 25,2 | 39,4 | 56,8 | - | - |

| Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{rec}$ | [kN] | 6,7 | 9,4 | 16,8 | 22,9 | 36,3 | 49,9 | 64,8 | 76,8 |
| | Shear | $V_{rec}$ | [kN] | 6,3 | 9,7 | 14,3 | 26,9 | 42,3 | 60,6 | 78,9 | 96,0 |
| Steel 8.8 | Tensile | $N_{rec}$ | [kN] | 6,7 | 9,4 | 16,8 | 22,9 | 36,3 | 49,9 | 64,8 | 76,8 |
| | Shear | $V_{rec}$ | [kN] | 8,6 | 13,1 | 19,4 | 36,0 | 56,0 | 80,6 | 105,1 | 128,0 |
| A4-50 | Tensile | $N_{rec}$ | [kN] | 4,5 | 7,2 | 10,5 | 19,7 | 30,7 | 44,2 | 57,4 | 70,2 |
| | Shear | $V_{rec}$ | [kN] | 2,7 | 4,5 | 6,3 | 11,7 | 18,3 | 26,4 | 34,5 | 42,0 |
| A4-70 | Tensile | $N_{rec}$ | [kN] | 6,7 | 9,4 | 16,8 | 22,9 | 36,3 | 49,9 | - | - |
| | Shear | $V_{rec}$ | [kN] | 6,0 | 9,2 | 13,7 | 25,2 | 39,4 | 56,8 | - | - |

**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 **engineering@iccons.com.au** for further information.

HD HAMMER

## Recommended Loads Flooded Holes (Hammer Drilled)

| Non-Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{rec}$ | [kN] | 8,6 | 13,8 | 20,0 | 27,3 | 43,3 | 59,4 | 77,2 | 91,5 |
| | Shear | $V_{rec}$ | [kN] | 6,3 | 9,7 | 14,3 | 26,9 | 42,3 | 60,6 | 78,9 | 96,0 |
| Steel 8.8 | Tensile | $N_{rec}$ | [kN] | 13,8 | 16,7 | 22,5 | 27,3 | 43,3 | 59,4 | 77,2 | 91,5 |
| | Shear | $V_{rec}$ | [kN] | 8,6 | 13,1 | 19,4 | 36,0 | 56,0 | 80,6 | 105,1 | 128,0 |
| A4-50 | Tensile | $N_{rec}$ | [kN] | 4,5 | 7,2 | 10,5 | 19,7 | 30,7 | 44,2 | 57,4 | 70,2 |
| | Shear | $V_{rec}$ | [kN] | 2,7 | 4,5 | 6,3 | 11,7 | 18,3 | 26,4 | 34,5 | 42,0 |
| A4-70 | Tensile | $N_{rec}$ | [kN] | 9,9 | 15,7 | 22,5 | 27,3 | 43,3 | 59,4 | - | - |
| | Shear | $V_{rec}$ | [kN] | 6,0 | 9,2 | 13,7 | 25,2 | 39,4 | 56,8 | - | - |

| Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{rec}$ | [kN] | 5,6 | 7,9 | 14,0 | 19,1 | 30,3 | 41,6 | 54,0 | 64,0 |
| | Shear | $V_{rec}$ | [kN] | 6,3 | 9,7 | 14,3 | 26,9 | 42,3 | 60,6 | 78,9 | 96,0 |
| Steel 8.8 | Tensile | $N_{rec}$ | [kN] | 5,6 | 7,9 | 14,0 | 19,1 | 30,3 | 41,6 | 54,0 | 64,0 |
| | Shear | $V_{rec}$ | [kN] | 8,6 | 13,1 | 19,4 | 36,0 | 56,0 | 80,6 | 105,1 | 128,0 |
| A4-50 | Tensile | $N_{rec}$ | [kN] | 4,5 | 7,2 | 10,5 | 19,1 | 30,3 | 41,6 | 54,0 | 64,0 |
| | Shear | $V_{rec}$ | [kN] | 2,7 | 4,5 | 6,3 | 11,7 | 18,3 | 26,4 | 34,5 | 42,0 |
| A4-70 | Tensile | $N_{rec}$ | [kN] | 5,6 | 7,9 | 14,0 | 19,1 | 30,3 | 41,6 | - | - |
| | Shear | $V_{rec}$ | [kN] | 6,0 | 9,2 | 13,7 | 25,2 | 39,4 | 56,8 | - | - |

HD B HAMMER

## Design Resistance Dry/Wet Holes (Hollow Drilling)

Steel Decisive

| Non-Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{Rd}$ | [kN] | 12,0 | 19,3 | 28,0 | 45,8 | 72,7 | 99,8 | 129,6 | 153,7 |
| | Shear | $V_{Rd}$ | [kN] | 8,8 | 13,6 | 20,0 | 37,6 | 59,2 | 84,8 | 110,4 | 134,4 |
| Steel 8.8 | Tensile | $N_{Rd}$ | [kN] | 19,3 | 28,0 | 37,8 | 45,8 | 72,7 | 99,8 | 129,6 | 153,7 |
| | Shear | $V_{Rd}$ | [kN] | 12,0 | 18,4 | 27,2 | 50,4 | 78,4 | 112,8 | 147,2 | 179,2 |
| A4-50 | Tensile | $N_{Rd}$ | [kN] | 6,3 | 10,1 | 14,7 | 27,6 | 43,0 | 61,9 | 80,4 | 98,3 |
| | Shear | $V_{Rd}$ | [kN] | 3,8 | 6,3 | 8,8 | 16,4 | 25,6 | 37,0 | 48,3 | 58,8 |
| A4-70 | Tensile | $N_{Rd}$ | [kN] | 13,9 | 21,9 | 31,6 | 45,8 | 72,7 | 99,8 | - | - |
| | 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 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{Rd}$ | [kN] | 9,4 | 13,2 | 23,5 | 32,1 | 50,9 | 69,9 | 90,7 | 107,6 |
| | Shear | $V_{Rd}$ | [kN] | 8,8 | 13,6 | 20,0 | 37,6 | 59,2 | 84,8 | 110,4 | 134,4 |
| Steel 8.8 | Tensile | $N_{Rd}$ | [kN] | 9,4 | 13,2 | 23,5 | 32,1 | 50,9 | 69,9 | 90,7 | 107,6 |
| | Shear | $V_{Rd}$ | [kN] | 12,0 | 18,4 | 27,2 | 50,4 | 78,4 | 112,8 | 147,2 | 179,2 |
| A4-50 | Tensile | $N_{Rd}$ | [kN] | 6,3 | 10,1 | 14,7 | 27,6 | 43,0 | 61,9 | 80,4 | 98,3 |
| | Shear | $V_{Rd}$ | [kN] | 3,8 | 6,3 | 8,8 | 16,4 | 25,6 | 37,0 | 48,3 | 58,8 |
| A4-70 | Tensile | $N_{Rd}$ | [kN] | 9,4 | 13,2 | 23,5 | 32,1 | 50,9 | 69,9 | - | - |
| | Shear | $V_{Rd}$ | [kN] | 8,3 | 12,8 | 19,2 | 35,3 | 55,1 | 79,5 | - | - |

## Design Resistance Flooded Holes (Hollow Drilling)

Steel Decisive

| Non-Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{Rd}$ | [kN] | 12,0 | 19,3 | 28,0 | 38,2 | 60,6 | 83,2 | 108,0 | 128,0 |
| | Shear | $V_{Rd}$ | [kN] | 8,8 | 13,6 | 20,0 | 37,6 | 59,2 | 84,8 | 110,4 | 134,4 |
| Steel 8.8 | Tensile | $N_{Rd}$ | [kN] | 17,9 | 23,3 | 31,5 | 38,2 | 60,6 | 83,2 | 108,0 | 128,0 |
| | Shear | $V_{Rd}$ | [kN] | 12,0 | 18,4 | 27,2 | 50,4 | 78,4 | 112,8 | 147,2 | 179,2 |
| A4-50 | Tensile | $N_{Rd}$ | [kN] | 6,3 | 10,1 | 14,7 | 27,6 | 43,0 | 61,9 | 80,4 | 98,3 |
| | Shear | $V_{Rd}$ | [kN] | 3,8 | 6,3 | 8,8 | 16,4 | 25,6 | 37,0 | 48,3 | 58,8 |
| A4-70 | Tensile | $N_{Rd}$ | [kN] | 13,9 | 21,9 | 31,5 | 38,2 | 60,6 | 83,2 | - | - |
| | 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 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{Rd}$ | [kN] | 7,8 | 11,0 | 19,6 | 26,7 | 42,4 | 58,2 | 75,6 | 89,6 |
| | Shear | $V_{Rd}$ | [kN] | 8,8 | 13,6 | 20,0 | 37,6 | 59,2 | 84,8 | 110,4 | 134,4 |
| Steel 8.8 | Tensile | $N_{Rd}$ | [kN] | 7,8 | 11,0 | 19,6 | 26,7 | 42,4 | 58,2 | 75,6 | 89,6 |
| | Shear | $V_{Rd}$ | [kN] | 12,0 | 18,4 | 27,2 | 50,4 | 78,4 | 112,8 | 147,2 | 179,2 |
| A4-50 | Tensile | $N_{Rd}$ | [kN] | 6,3 | 10,1 | 14,7 | 26,7 | 42,4 | 58,2 | 75,6 | 89,6 |
| | Shear | $V_{Rd}$ | [kN] | 3,8 | 6,3 | 8,8 | 16,4 | 25,6 | 37,0 | 48,3 | 58,8 |
| A4-70 | Tensile | $N_{Rd}$ | [kN] | 7,8 | 11,0 | 19,6 | 26,7 | 42,4 | 58,2 | - | - |
| | Shear | $V_{Rd}$ | [kN] | 8,3 | 12,8 | 19,2 | 35,3 | 55,1 | 79,5 | - | - |

## Recommended Loads Dry/Wet Holes (Hollow Drilling)

| Non-Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{rec}$ | [kN] | 8,6 | 13,8 | 20,0 | 32,7 | 51,9 | 71,3 | 92,6 | 109,8 |
| | Shear | $V_{rec}$ | [kN] | 6,3 | 9,7 | 14,3 | 26,9 | 42,3 | 60,6 | 78,9 | 96,0 |
| Steel 8.8 | Tensile | $N_{rec}$ | [kN] | 13,8 | 20,0 | 27,0 | 32,7 | 51,9 | 71,3 | 92,6 | 109,8 |
| | Shear | $V_{rec}$ | [kN] | 8,6 | 13,1 | 19,4 | 36,0 | 56,0 | 80,6 | 105,1 | 128,0 |
| A4-50 | Tensile | $N_{rec}$ | [kN] | 4,5 | 7,2 | 10,5 | 19,7 | 30,7 | 44,2 | 57,4 | 70,2 |
| | Shear | $V_{rec}$ | [kN] | 2,7 | 4,5 | 6,3 | 11,7 | 18,3 | 26,4 | 34,5 | 42,0 |
| A4-70 | Tensile | $N_{rec}$ | [kN] | 9,9 | 15,7 | 22,5 | 32,7 | 51,9 | 71,3 | - | - |
| | Shear | $V_{rec}$ | [kN] | 6,0 | 9,2 | 13,7 | 25,2 | 39,4 | 56,8 | - | - |

| Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{rec}$ | [kN] | 6,7 | 9,4 | 16,8 | 22,9 | 36,3 | 49,9 | 64,8 | 76,8 |
| | Shear | $V_{rec}$ | [kN] | 6,3 | 9,7 | 14,3 | 26,9 | 42,3 | 60,6 | 78,9 | 96,0 |
| Steel 8.8 | Tensile | $N_{rec}$ | [kN] | 6,7 | 9,4 | 16,8 | 22,9 | 36,3 | 49,9 | 64,8 | 76,8 |
| | Shear | $V_{rec}$ | [kN] | 8,6 | 13,1 | 19,4 | 36,0 | 56,0 | 80,6 | 105,1 | 128,0 |
| A4-50 | Tensile | $N_{rec}$ | [kN] | 4,5 | 7,2 | 10,5 | 19,7 | 30,7 | 44,2 | 57,4 | 70,2 |
| | Shear | $V_{rec}$ | [kN] | 2,7 | 4,5 | 6,3 | 11,7 | 18,3 | 26,4 | 34,5 | 42,0 |
| A4-70 | Tensile | $N_{rec}$ | [kN] | 6,7 | 9,4 | 16,8 | 22,9 | 36,3 | 49,9 | - | - |
| | Shear | $V_{rec}$ | [kN] | 6,0 | 9,2 | 13,7 | 25,2 | 39,4 | 56,8 | - | - |

HAMMER

## Recommended Loads Flooded Holes (Hollow Drilling)

| Non-Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{rec}$ | [kN] | 8,6 | 13,8 | 20,0 | 31,8 | 50,5 | 69,3 | 90,0 | 106,7 |
| | Shear | $V_{rec}$ | [kN] | 6,3 | 9,7 | 14,3 | 26,9 | 42,3 | 60,6 | 78,9 | 96,0 |
| Steel 8.8 | Tensile | $N_{rec}$ | [kN] | 12,8 | 18,0 | 26,3 | 31,8 | 50,5 | 69,3 | 90,0 | 106,7 |
| | Shear | $V_{rec}$ | [kN] | 8,6 | 13,1 | 19,4 | 36,0 | 56,0 | 80,6 | 105,1 | 128,0 |
| A4-50 | Tensile | $N_{rec}$ | [kN] | 4,5 | 7,2 | 10,5 | 19,7 | 30,7 | 44,2 | 57,4 | 70,2 |
| | Shear | $V_{rec}$ | [kN] | 2,7 | 4,5 | 6,3 | 11,7 | 18,3 | 26,4 | 34,5 | 42,0 |
| A4-70 | Tensile | $N_{rec}$ | [kN] | 9,9 | 15,7 | 22,5 | 31,8 | 50,5 | 69,3 | - | - |
| | Shear | $V_{rec}$ | [kN] | 6,0 | 9,2 | 13,7 | 25,2 | 39,4 | 56,8 | - | - |

| Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{rec}$ | [kN] | 5,6 | 7,9 | 14,0 | 19,1 | 30,3 | 41,6 | 54,0 | 64,0 |
| | Shear | $V_{rec}$ | [kN] | 6,3 | 9,7 | 14,3 | 26,9 | 42,3 | 60,6 | 78,9 | 96,0 |
| Steel 8.8 | Tensile | $N_{rec}$ | [kN] | 5,6 | 7,9 | 14,0 | 19,1 | 30,3 | 41,6 | 54,0 | 64,0 |
| | Shear | $V_{rec}$ | [kN] | 8,6 | 13,1 | 19,4 | 36,0 | 56,0 | 80,6 | 105,1 | 128,0 |
| A4-50 | Tensile | $N_{rec}$ | [kN] | 4,5 | 7,2 | 10,5 | 19,1 | 30,3 | 41,6 | 54,0 | 64,0 |
| | Shear | $V_{rec}$ | [kN] | 2,7 | 4,5 | 6,3 | 11,7 | 18,3 | 26,4 | 34,5 | 42,0 |
| A4-70 | Tensile | $N_{rec}$ | [kN] | 5,6 | 7,9 | 14,0 | 19,1 | 30,3 | 41,6 | - | - |
| | Shear | $V_{rec}$ | [kN] | 6,0 | 9,2 | 13,7 | 25,2 | 39,4 | 56,8 | - | - |

**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 **engineering@iccons.com.au** for further information.

DD DIAMOND

## Design Resistance Dry/Wet Holes (Diamond Drilling)

Steel Decisive

| Non-Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{Rd}$ | [kN] | 12,0 | 19,3 | 28,0 | 45,8 | 72,7 | 99,8 | 129,6 | 153,7 |
| | Shear | $V_{Rd}$ | [kN] | 8,8 | 13,6 | 20,0 | 37,6 | 59,2 | 84,8 | 110,4 | 134,4 |
| Steel 8.8 | Tensile | $N_{Rd}$ | [kN] | 19,3 | 26,4 | 37,8 | 45,8 | 72,7 | 99,8 | 129,6 | 153,7 |
| | Shear | $V_{Rd}$ | [kN] | 12,0 | 18,4 | 27,2 | 50,4 | 78,4 | 112,8 | 147,2 | 179,2 |
| A4-50 | Tensile | $N_{Rd}$ | [kN] | 6,3 | 10,1 | 14,7 | 27,6 | 43,0 | 61,9 | 80,4 | 98,3 |
| | Shear | $V_{Rd}$ | [kN] | 3,8 | 6,3 | 8,8 | 16,4 | 25,6 | 37,0 | 48,3 | 58,8 |
| A4-70 | Tensile | $N_{Rd}$ | [kN] | 13,9 | 21,9 | 31,6 | 45,8 | 72,7 | 99,8 | - | - |
| | Shear | $V_{Rd}$ | [kN] | 8,3 | 12,8 | 19,2 | 35,3 | 55,1 | 79,5 | - | - |

## Design Resistance Flooded Holes (Diamond Drilled)

| Non-Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{Rd}$ | [kN] | 12,0 | 19,3 | 28,0 | 32,7 | 51,9 | 71,3 | 92,6 | 109,8 |
| | Shear | $V_{Rd}$ | [kN] | 8,8 | 13,6 | 20,0 | 37,6 | 59,2 | 84,8 | 110,4 | 134,4 |
| Steel 8.8 | Tensile | $N_{Rd}$ | [kN] | 16,8 | 22,0 | 31,5 | 32,7 | 51,9 | 71,3 | 92,6 | 109,8 |
| | Shear | $V_{Rd}$ | [kN] | 12,0 | 18,4 | 27,2 | 50,4 | 78,4 | 112,8 | 147,2 | 179,2 |
| A4-50 | Tensile | $N_{Rd}$ | [kN] | 6,3 | 10,1 | 14,7 | 27,6 | 43,0 | 61,9 | 80,4 | 98,3 |
| | Shear | $V_{Rd}$ | [kN] | 3,8 | 6,3 | 8,8 | 16,4 | 25,6 | 37,0 | 48,3 | 58,8 |
| A4-70 | Tensile | $N_{Rd}$ | [kN] | 13,9 | 21,9 | 31,5 | 32,7 | 51,9 | 71,3 | - | - |
| | Shear | $V_{Rd}$ | [kN] | 8,3 | 12,8 | 19,2 | 35,3 | 55,1 | 79,5 | - | - |

## Recommended Loads Dry/Wet Holes (Diamond Drilled)

| Non-Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{rec}$ | [kN] | 8,6 | 13,8 | 20,0 | 32,7 | 51,9 | 71,3 | 92,6 | 109,8 |
| | Shear | $V_{rec}$ | [kN] | 6,3 | 9,7 | 14,3 | 26,9 | 42,3 | 60,6 | 78,9 | 96,0 |
| Steel 8.8 | Tensile | $N_{rec}$ | [kN] | 13,8 | 18,8 | 27,0 | 32,7 | 51,9 | 71,3 | 92,6 | 109,8 |
| | Shear | $V_{rec}$ | [kN] | 8,6 | 13,1 | 19,4 | 36,0 | 56,0 | 80,6 | 105,1 | 128,0 |
| A4-50 | Tensile | $N_{rec}$ | [kN] | 4,5 | 7,2 | 10,5 | 19,7 | 30,7 | 44,2 | 57,4 | 70,2 |
| | Shear | $V_{rec}$ | [kN] | 2,7 | 4,5 | 6,3 | 11,7 | 18,3 | 26,4 | 34,5 | 42,0 |
| A4-70 | Tensile | $N_{rec}$ | [kN] | 9,9 | 15,7 | 22,5 | 32,7 | 51,9 | 71,3 | - | - |
| | Shear | $V_{rec}$ | [kN] | 6,0 | 9,2 | 13,7 | 25,2 | 39,4 | 56,8 | - | - |

## Recommended Loads Flooded Holes (Diamond Drilled)

| Non-Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{rec}$ | [kN] | 8,6 | 13,8 | 20,0 | 23,4 | 37,1 | 50,9 | 66,1 | 78,4 |
| | Shear | $V_{rec}$ | [kN] | 6,3 | 9,7 | 14,3 | 26,9 | 42,3 | 60,6 | 78,9 | 96,0 |
| Steel 8.8 | Tensile | $N_{rec}$ | [kN] | 12,0 | 15,7 | 22,5 | 23,4 | 37,1 | 50,9 | 66,1 | 78,4 |
| | Shear | $V_{rec}$ | [kN] | 8,6 | 13,1 | 19,4 | 36,0 | 56,0 | 80,6 | 105,1 | 128,0 |
| A4-50 | Tensile | $N_{rec}$ | [kN] | 4,5 | 7,2 | 10,5 | 19,7 | 30,7 | 44,2 | 57,4 | 70,2 |
| | Shear | $V_{rec}$ | [kN] | 2,7 | 4,5 | 6,3 | 11,7 | 18,3 | 26,4 | 34,5 | 42,0 |
| A4-70 | Tensile | $N_{rec}$ | [kN] | 9,9 | 15,7 | 22,5 | 23,4 | 37,1 | 50,9 | - | - |
| | Shear | $V_{rec}$ | [kN] | 6,0 | 9,2 | 13,7 | 25,2 | 39,4 | 56,8 | - | - |

## Seismic resistance for a service life of 50 years (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, 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.
- $\alpha_{gap}$ = 1,0 (using special filling washer according ETA-19/0850 Annex A 3).
- Increasing factor for concrete $\psi_c$: C25/30 to C50/60 = 1,0


### Design Resistance Dry/Wet Holes in case of seismic performance category C1 (Hammer/Hollow Drilling)

Steel Decisive

| Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{Rd,eq,C1}$ | [kN] | 9,4 | 13,2 | 22,5 | 27,3 | 43,3 | 59,4 | 77,1 | 91,4 |
| | Shear | $V_{Rd,eq,C1}$ | [kN] | 6,2 | 9,5 | 14,0 | 26,3 | 41,4 | 59,4 | 77,3 | 94,1 |
| Steel 8.8 | Tensile | $N_{Rd,eq,C1}$ | [kN] | 9,4 | 13,2 | 22,5 | 27,3 | 43,3 | 59,4 | 77,1 | 91,4 |
| | Shear | $V_{Rd,eq,C1}$ | [kN] | 8,4 | 12,9 | 19,0 | 35,3 | 54,9 | 79,0 | 103,0 | 125,4 |
| A4-50 | Tensile | $N_{Rd,eq,C1}$ | [kN] | 6,3 | 10,1 | 14,7 | 27,3 | 43,0 | 59,4 | 77,1 | 91,4 |
| | Shear | $V_{Rd,eq,C1}$ | [kN] | 2,6 | 4,4 | 6,2 | 11,5 | 17,9 | 25,9 | 33,8 | 41,2 |
| A4-70 | Tensile | $N_{Rd,eq,C1}$ | [kN] | 9,4 | 13,2 | 22,5 | 27,3 | 43,3 | 59,4 | - | - |
| | Shear | $V_{Rd,eq,C1}$ | [kN] | 5,8 | 9,0 | 13,5 | 24,7 | 38,6 | 55,6 | - | - |

### Design Resistance Flooded Holes in case of seismic performance category C1 (Hammer/Hollow Drilling)

| Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{Rd,eq,C1}$ | [kN] | 7,8 | 11,0 | 18,8 | 22,7 | 36,0 | 49,5 | 64,3 | 76,2 |
| | Shear | $V_{Rd,eq,C1}$ | [kN] | 6,2 | 9,5 | 14,0 | 26,3 | 41,4 | 59,4 | 77,3 | 94,1 |
| Steel 8.8 | Tensile | $N_{Rd,eq,C1}$ | [kN] | 7,8 | 11,0 | 18,8 | 22,7 | 36,0 | 49,5 | 64,3 | 76,2 |
| | Shear | $V_{Rd,eq,C1}$ | [kN] | 8,4 | 12,9 | 19,0 | 35,3 | 54,9 | 79,0 | 103,0 | 125,4 |
| A4-50 | Tensile | $N_{Rd,eq,C1}$ | [kN] | 6,3 | 10,1 | 14,7 | 22,7 | 36,0 | 49,5 | 64,3 | 76,2 |
| | Shear | $V_{Rd,eq,C1}$ | [kN] | 2,6 | 4,4 | 6,2 | 11,5 | 17,9 | 25,9 | 33,8 | 41,2 |
| A4-70 | Tensile | $N_{Rd,eq,C1}$ | [kN] | 7,8 | 11,0 | 18,8 | 22,7 | 36,0 | 49,5 | - | - |
| | Shear | $V_{Rd,eq,C1}$ | [kN] | 5,8 | 9,0 | 13,5 | 24,7 | 38,6 | 55,6 | - | - |

**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 **engineering@iccons.com.au** for further information.


## Design Resistance Dry/Wet Holes in case of seismic performance category C2 (Hammer/Hollow Drilling)

Steel Decisive

| Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 8.8 | Tensile | $N_{Rd,eq,C2}$ | [kN] | - | - | 16,0 | 20,1 | 35,6 | 53,8 | - | - |
| | Shear | $V_{Rd,eq,C2}$ | [kN] | - | - | 19,0 | 34,2 | 54,9 | 79,0 | - | - |
| A4-70 | Tensile | $N_{Rd,eq,C2}$ | [kN] | - | - | 16,0 | 20,1 | 35,6 | 53,8 | - | - |
| | Shear | $V_{Rd,eq,C2}$ | [kN] | - | - | 13,5 | 24,7 | 38,6 | 55,6 | - | - |

## Design Resistance Flooded Holes in case of seismic performance category C2 (Hammer/Hollow Drilling)

| Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 8.8 | Tensile | $N_{Rd,eq,C2}$ | [kN] | - | - | 13,4 | 16,8 | 29,7 | 44,9 | - | - |
| | Shear | $V_{Rd,eq,C2}$ | [kN] | - | - | 19,0 | 34,2 | 54,9 | 79,0 | - | - |
| A4-70 | Tensile | $N_{Rd,eq,C2}$ | [kN] | - | - | 13,4 | 16,8 | 29,7 | 44,9 | - | - |
| | Shear | $V_{Rd,eq,C2}$ | [kN] | - | - | 13,5 | 24,7 | 38,6 | 55,6 | - | - |

**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 **engineering@iccons.com.au** for further information.

# Static and quasi-static resistance for a service life of 100 years (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.
- $\psi_{sus}$ = 1,0 according EN 1992-4:2018; eq. 7.14a.
- Recommended loads are with overal partial safety factor for action $\gamma_G$ = 1,4.
  The partial safety factors for action depend on the type of loading and shall be taken from national regulations.

HD HAMMER

100+ YEAR DESIGN LIFE

## Design Resistance Dry/Wet Holes (Hammer Drilled)

Steel Decisive

| Non-Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{Rd}$ | [kN] | 12,0 | 19,3 | 28,0 | 45,8 | 72,7 | 99,8 | 129,6 | 153,7 |
| | Shear | $V_{Rd}$ | [kN] | 8,8 | 13,6 | 20,0 | 37,6 | 59,2 | 84,8 | 110,4 | 134,4 |
| Steel 8.8 | Tensile | $N_{Rd}$ | [kN] | 19,3 | 28,0 | 37,8 | 45,8 | 72,7 | 99,8 | 129,6 | 153,7 |
| | Shear | $V_{Rd}$ | [kN] | 12,0 | 18,4 | 27,2 | 50,4 | 78,4 | 112,8 | 147,2 | 179,2 |
| A4-50 | Tensile | $N_{Rd}$ | [kN] | 6,3 | 10,1 | 14,7 | 27,6 | 43,0 | 61,9 | 80,4 | 98,3 |
| | Shear | $V_{Rd}$ | [kN] | 3,8 | 6,3 | 8,8 | 16,4 | 25,6 | 37,0 | 48,3 | 58,8 |
| A4-70 | Tensile | $N_{Rd}$ | [kN] | 13,9 | 21,9 | 31,6 | 45,8 | 72,7 | 99,8 | - | - |
| | Shear | $V_{Rd}$ | [kN] | 8,3 | 12,8 | 19,2 | 35,3 | 55,1 | 79,5 | - | - |

## Design Resistance Flooded Holes (Hammer Drilled)

| Non-Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{Rd}$ | [kN] | 12,0 | 19,3 | 28,0 | 38,2 | 60,6 | 83,2 | 108,0 | 128,0 |
| | Shear | $V_{Rd}$ | [kN] | 8,8 | 13,6 | 20,0 | 37,6 | 59,2 | 84,8 | 110,4 | 134,4 |
| Steel 8.8 | Tensile | $N_{Rd}$ | [kN] | 19,3 | 23,3 | 31,5 | 38,2 | 60,6 | 83,2 | 108,0 | 128,0 |
| | Shear | $V_{Rd}$ | [kN] | 12,0 | 18,4 | 27,2 | 50,4 | 78,4 | 112,8 | 147,2 | 179,2 |
| A4-50 | Tensile | $N_{Rd}$ | [kN] | 6,3 | 10,1 | 14,7 | 27,6 | 43,0 | 61,9 | 80,4 | 98,3 |
| | Shear | $V_{Rd}$ | [kN] | 3,8 | 6,3 | 8,8 | 16,4 | 25,6 | 37,0 | 48,3 | 58,8 |
| A4-70 | Tensile | $N_{Rd}$ | [kN] | 13,9 | 21,9 | 31,5 | 38,2 | 60,6 | 83,2 | - | - |
| | 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 please refer to ICCONS DesignPRO software or contact Iccons engineering department **engineering@iccons.com.au** for further information.



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## Recommended Loads Dry/Wet Holes (Hammer Drilled)

| Non-Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{rec}$ | [kN] | 8,6 | 13,8 | 20,0 | 32,7 | 51,9 | 71,3 | 92,6 | 109,8 |
| | Shear | $V_{rec}$ | [kN] | 6,3 | 9,7 | 14,3 | 26,9 | 42,3 | 60,6 | 78,9 | 96,0 |
| Steel 8.8 | Tensile | $N_{rec}$ | [kN] | 13,8 | 20,0 | 27,0 | 32,7 | 51,9 | 71,3 | 92,6 | 109,8 |
| | Shear | $V_{rec}$ | [kN] | 8,6 | 13,1 | 19,4 | 36,0 | 56,0 | 80,6 | 105,1 | 128,0 |
| A4-50 | Tensile | $N_{rec}$ | [kN] | 4,5 | 7,2 | 10,5 | 19,7 | 30,7 | 44,2 | 57,4 | 70,2 |
| | Shear | $V_{rec}$ | [kN] | 2,7 | 4,5 | 6,3 | 11,7 | 18,3 | 26,4 | 34,5 | 42,0 |
| A4-70 | Tensile | $N_{rec}$ | [kN] | 9,9 | 15,7 | 22,5 | 32,7 | 51,9 | 71,3 | - | - |
| | Shear | $V_{rec}$ | [kN] | 6,0 | 9,2 | 13,7 | 25,2 | 39,4 | 56,8 | - | - |

## Recommended Loads Flooded Holes (Hammer Drilled)

| Non-Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{rec}$ | [kN] | 8,6 | 13,8 | 20,0 | 31,8 | 50,5 | 69,3 | 90,0 | 106,7 |
| | Shear | $V_{rec}$ | [kN] | 6,3 | 9,7 | 14,3 | 26,9 | 42,3 | 60,6 | 78,9 | 96,0 |
| Steel 8.8 | Tensile | $N_{rec}$ | [kN] | 12,8 | 18,0 | 26,3 | 31,8 | 50,5 | 69,3 | 90,0 | 106,7 |
| | Shear | $V_{rec}$ | [kN] | 8,6 | 13,1 | 19,4 | 36,0 | 56,0 | 80,6 | 105,1 | 128,0 |
| A4-50 | Tensile | $N_{rec}$ | [kN] | 4,5 | 7,2 | 10,5 | 19,7 | 30,7 | 44,2 | 57,4 | 70,2 |
| | Shear | $V_{rec}$ | [kN] | 2,7 | 4,5 | 6,3 | 11,7 | 18,3 | 26,4 | 34,5 | 42,0 |
| A4-70 | Tensile | $N_{rec}$ | [kN] | 9,9 | 15,7 | 22,5 | 31,8 | 50,5 | 69,3 | - | - |
| | Shear | $V_{rec}$ | [kN] | 6,0 | 9,2 | 13,7 | 25,2 | 39,4 | 56,8 | - | - |

HAMMER

100+ YEAR DESIGN LIFE

## Design Resistance Dry/Wet Holes (Hollow Drilling)

Steel Decisive

| Non-Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{Rd}$ | [kN] | 12,0 | 19,3 | 28,0 | 45,8 | 72,7 | 99,8 | 129,6 | 153,7 |
| | Shear | $V_{Rd}$ | [kN] | 8,8 | 13,6 | 20,0 | 37,6 | 59,2 | 84,8 | 110,4 | 134,4 |
| Steel 8.8 | Tensile | $N_{Rd}$ | [kN] | 19,3 | 28,0 | 37,8 | 45,8 | 72,7 | 99,8 | 129,6 | 153,7 |
| | Shear | $V_{Rd}$ | [kN] | 12,0 | 18,4 | 27,2 | 50,4 | 78,4 | 112,8 | 147,2 | 179,2 |
| A4-50 | Tensile | $N_{Rd}$ | [kN] | 6,3 | 10,1 | 14,7 | 27,6 | 43,0 | 61,9 | 80,4 | 98,3 |
| | Shear | $V_{Rd}$ | [kN] | 3,8 | 6,3 | 8,8 | 16,4 | 25,6 | 37,0 | 48,3 | 58,8 |
| A4-70 | Tensile | $N_{Rd}$ | [kN] | 13,9 | 21,9 | 31,6 | 45,8 | 72,7 | 99,8 | - | - |
| | 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 please refer to ICCONS DesignPRO software or contact Iccons engineering department **engineering@iccons.com.au** for further information.

HAMMER
100+ YEAR DESIGN LIFE

## Design Resistance Flooded Holes (Hollow Drilling)

Steel Decisive

| Non-Cracked Concrete | Da | | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{Rd}$ | [kN] | 12,0 | 19,3 | 28,0 | 38,2 | 60,6 | 83,2 | 108,0 | 128,0 |
| | Shear | $V_{Rd}$ | [kN] | 8,8 | 13,6 | 20,0 | 37,6 | 59,2 | 84,8 | 110,4 | 134,4 |
| Steel 8.8 | Tensile | $N_{Rd}$ | [kN] | 17,9 | 23,3 | 31,5 | 38,2 | 60,6 | 83,2 | 108,0 | 128,0 |
| | Shear | $V_{Rd}$ | [kN] | 12,0 | 18,4 | 27,2 | 50,4 | 78,4 | 112,8 | 147,2 | 179,2 |
| A4-50 | Tensile | $N_{Rd}$ | [kN] | 6,3 | 10,1 | 14,7 | 27,6 | 43,0 | 61,9 | 80,4 | 98,3 |
| | Shear | $V_{Rd}$ | [kN] | 3,8 | 6,3 | 8,8 | 16,4 | 25,6 | 37,0 | 48,3 | 58,8 |
| A4-70 | Tensile | $N_{Rd}$ | [kN] | 13,9 | 21,9 | 31,5 | 38,2 | 60,6 | 83,2 | - | - |
| | Shear | $V_{Rd}$ | [kN] | 8,3 | 12,8 | 19,2 | 35,3 | 55,1 | 79,5 | - | - |

## Recommended Loads Dry/Wet Holes (Hollow Drilling)

| Non-Cracked Concrete | Da | | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{rec}$ | [kN] | 8,6 | 13,8 | 20,0 | 32,7 | 51,9 | 71,3 | 92,6 | 109,8 |
| | Shear | $V_{rec}$ | [kN] | 6,3 | 9,7 | 14,3 | 26,9 | 42,3 | 60,6 | 78,9 | 96,0 |
| Steel 8.8 | Tensile | $N_{rec}$ | [kN] | 13,8 | 20,0 | 27,0 | 32,7 | 51,9 | 71,3 | 92,6 | 109,8 |
| | Shear | $V_{rec}$ | [kN] | 8,6 | 13,1 | 19,4 | 36,0 | 56,0 | 80,6 | 105,1 | 128,0 |
| A4-50 | Tensile | $N_{rec}$ | [kN] | 4,5 | 7,2 | 10,5 | 19,7 | 30,7 | 44,2 | 57,4 | 70,2 |
| | Shear | $V_{rec}$ | [kN] | 2,7 | 4,5 | 6,3 | 11,7 | 18,3 | 26,4 | 34,5 | 42,0 |
| A4-70 | Tensile | $N_{rec}$ | [kN] | 9,9 | 15,7 | 22,5 | 32,7 | 51,9 | 71,3 | - | - |
| | Shear | $V_{rec}$ | [kN] | 6,0 | 9,2 | 13,7 | 25,2 | 39,4 | 56,8 | - | - |

## Recommended Loads Flooded Holes (Hollow Drilling)

| Non-Cracked Concrete | Da | | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{rec}$ | [kN] | 8,6 | 13,8 | 20,0 | 31,8 | 50,5 | 69,3 | 90,0 | 106,7 |
| | Shear | $V_{rec}$ | [kN] | 6,3 | 9,7 | 14,3 | 26,9 | 42,3 | 60,6 | 78,9 | 96,0 |
| Steel 8.8 | Tensile | $N_{rec}$ | [kN] | 12,8 | 18,0 | 26,3 | 31,8 | 50,5 | 69,3 | 90,0 | 106,7 |
| | Shear | $V_{rec}$ | [kN] | 8,6 | 13,1 | 19,4 | 36,0 | 56,0 | 80,6 | 105,1 | 128,0 |
| A4-50 | Tensile | $N_{rec}$ | [kN] | 4,5 | 7,2 | 10,5 | 19,7 | 30,7 | 44,2 | 57,4 | 70,2 |
| | Shear | $V_{rec}$ | [kN] | 2,7 | 4,5 | 6,3 | 11,7 | 18,3 | 26,4 | 34,5 | 42,0 |
| A4-70 | Tensile | $N_{rec}$ | [kN] | 9,9 | 15,7 | 22,5 | 31,8 | 50,5 | 69,3 | - | - |
| | Shear | $V_{rec}$ | [kN] | 6,0 | 9,2 | 13,7 | 25,2 | 39,4 | 56,8 | - | - |

**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 **engineering@iccons.com.au** for further information.


## Design Resistance Dry/Wet Holes (Hammer/Hollow Drilling)

Steel Decisive

| Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{Rd}$ | [kN] | 8,7 | 12,3 | 20,7 | 31,4 | 50,9 | 69,9 | 90,7 | 107,6 |
| | Shear | $V_{Rd}$ | [kN] | 8,8 | 13,6 | 20,0 | 37,6 | 59,2 | 84,8 | 110,4 | 134,4 |
| Steel 8.8 | Tensile | $N_{Rd}$ | [kN] | 8,7 | 12,3 | 20,7 | 31,4 | 50,9 | 69,9 | 90,7 | 107,6 |
| | Shear | $V_{Rd}$ | [kN] | 12,0 | 18,4 | 27,2 | 50,4 | 78,4 | 112,8 | 147,2 | 179,2 |
| A4-50 | Tensile | $N_{Rd}$ | [kN] | 6,3 | 10,1 | 14,7 | 27,6 | 43,0 | 61,9 | 80,4 | 98,3 |
| | Shear | $V_{Rd}$ | [kN] | 3,8 | 6,3 | 8,8 | 16,4 | 25,6 | 37,0 | 48,3 | 58,8 |
| A4-70 | Tensile | $N_{Rd}$ | [kN] | 8,7 | 12,3 | 20,7 | 31,4 | 50,9 | 69,9 | - | - |
| | Shear | $V_{Rd}$ | [kN] | 8,3 | 12,8 | 19,2 | 35,3 | 55,1 | 79,5 | - | - |

## Design Resistance Flooded Holes (Hammer/Hollow Drilling)

| Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{Rd}$ | [kN] | 7,3 | 10,2 | 17,3 | 26,2 | 42,4 | 58,2 | 75,6 | 89,6 |
| | Shear | $V_{Rd}$ | [kN] | 8,8 | 13,6 | 20,0 | 37,6 | 59,2 | 84,8 | 110,4 | 134,4 |
| Steel 8.8 | Tensile | $N_{Rd}$ | [kN] | 7,3 | 10,2 | 17,3 | 26,2 | 42,4 | 58,2 | 75,6 | 89,6 |
| | Shear | $V_{Rd}$ | [kN] | 12,0 | 18,4 | 27,2 | 50,4 | 78,4 | 112,8 | 147,2 | 179,2 |
| A4-50 | Tensile | $N_{Rd}$ | [kN] | 6,3 | 10,1 | 14,7 | 26,2 | 42,4 | 58,2 | 75,6 | 89,6 |
| | Shear | $V_{Rd}$ | [kN] | 3,8 | 6,3 | 8,8 | 16,4 | 25,6 | 37,0 | 48,3 | 58,8 |
| A4-70 | Tensile | $N_{Rd}$ | [kN] | 7,3 | 10,2 | 17,3 | 26,2 | 42,4 | 58,2 | - | - |
| | Shear | $V_{Rd}$ | [kN] | 8,3 | 12,8 | 19,2 | 35,3 | 55,1 | 79,5 | - | - |

## Recommended Loads Dry/Wet Holes (Hammer/Hollow Drilling)

| Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{rec}$ | [kN] | 6,2 | 8,8 | 14,8 | 22,4 | 36,3 | 49,9 | 64,8 | 76,8 |
| | Shear | $V_{rec}$ | [kN] | 6,3 | 9,7 | 14,3 | 26,9 | 42,3 | 60,6 | 78,9 | 96,0 |
| Steel 8.8 | Tensile | $N_{rec}$ | [kN] | 6,2 | 8,8 | 14,8 | 22,4 | 36,3 | 49,9 | 64,8 | 76,8 |
| | Shear | $V_{rec}$ | [kN] | 8,6 | 13,1 | 19,4 | 36,0 | 56,0 | 80,6 | 105,1 | 128,0 |
| A4-50 | Tensile | $N_{rec}$ | [kN] | 4,5 | 7,2 | 10,5 | 19,7 | 30,7 | 44,2 | 57,4 | 70,2 |
| | Shear | $V_{rec}$ | [kN] | 2,7 | 4,5 | 6,3 | 11,7 | 18,3 | 26,4 | 34,5 | 42,0 |
| A4-70 | Tensile | $N_{rec}$ | [kN] | 6,2 | 8,8 | 14,8 | 22,4 | 36,3 | 49,9 | - | - |
| | Shear | $V_{rec}$ | [kN] | 6,0 | 9,2 | 13,7 | 25,2 | 39,4 | 56,8 | - | - |

**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 **engineering@iccons.com.au** for further information.

HD HAMMER | HDB HAMMER | CRACKED CONCRETE | 100+ YEAR DESIGN LIFE

## Recommended Loads Flooded Holes (Hammer/Hollow Drilling)

| Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{rec}$ | [kN] | 5,2 | 7,3 | 12,3 | 18,7 | 30,3 | 41,6 | 54,0 | 64,0 |
| | Shear | $V_{rec}$ | [kN] | 6,3 | 9,7 | 14,3 | 26,9 | 42,3 | 60,6 | 78,9 | 96,0 |
| Steel 8.8 | Tensile | $N_{rec}$ | [kN] | 5,2 | 7,3 | 12,3 | 18,7 | 30,3 | 41,6 | 54,0 | 64,0 |
| | Shear | $V_{rec}$ | [kN] | 8,6 | 13,1 | 19,4 | 36,0 | 56,0 | 80,6 | 105,1 | 128,0 |
| A4-50 | Tensile | $N_{rec}$ | [kN] | 4,5 | 7,2 | 10,5 | 18,7 | 30,3 | 41,6 | 54,0 | 64,0 |
| | Shear | $V_{rec}$ | [kN] | 2,7 | 4,5 | 6,3 | 11,7 | 18,3 | 26,4 | 34,5 | 42,0 |
| A4-70 | Tensile | $N_{rec}$ | [kN] | 5,2 | 7,3 | 12,3 | 18,7 | 30,3 | 41,6 | - | - |
| | Shear | $V_{rec}$ | [kN] | 6,0 | 9,2 | 13,7 | 25,2 | 39,4 | 56,8 | - | - |

## Seismic resistance for a service life of 100 years (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, 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.
- $\alpha_{gap}$ = 1,0 (using special filling washer according ETA-19/0850 Annex A 3).
- Increasing factor for concrete $\psi_c$: C25/30 to C50/60 = 1,0

HD HAMMER | HDB HAMMER | CRACKED CONCRETE | SEISMIC C1 | 100+ YEAR DESIGN LIFE

## Design Resistance Dry/Wet Holes in case of seismic performance category C1 (Hammer/Hollow Drilling)

Steel Decisive

| Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{Rd,eq,C1}$ | [kN] | 9,4 | 13,2 | 22,5 | 27,3 | 43,3 | 59,4 | 77,1 | 91,4 |
| | Shear | $V_{Rd,eq,C1}$ | [kN] | 6,2 | 9,5 | 14,0 | 26,3 | 41,4 | 59,4 | 77,3 | 94,1 |
| Steel 8.8 | Tensile | $N_{Rd,eq,C1}$ | [kN] | 9,4 | 13,2 | 22,5 | 27,3 | 43,3 | 59,4 | 77,1 | 91,4 |
| | Shear | $V_{Rd,eq,C1}$ | [kN] | 8,4 | 12,9 | 19,0 | 35,3 | 54,9 | 79,0 | 103,0 | 125,4 |
| A4-50 | Tensile | $N_{Rd,eq,C1}$ | [kN] | 6,3 | 10,1 | 14,7 | 27,3 | 43,0 | 59,4 | 77,1 | 91,4 |
| | Shear | $V_{Rd,eq,C1}$ | [kN] | 2,6 | 4,4 | 6,2 | 11,5 | 17,9 | 25,9 | 33,8 | 41,2 |
| A4-70 | Tensile | $N_{Rd,eq,C1}$ | [kN] | 9,4 | 13,2 | 22,5 | 27,3 | 43,3 | 59,4 | - | - |
| | Shear | $V_{Rd,eq,C1}$ | [kN] | 5,8 | 9,0 | 13,5 | 24,7 | 38,6 | 55,6 | - | - |

# Seismic resistance for a service life of 100 years (for a single anchor)

## Design Resistance Flooded Holes in case of seismic performance category C1 (Hammer/Hollow Drilling)

Steel Decisive

| Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 5.8 | Tensile | $N_{Rd,eq,C1}$ | [kN] | 7,8 | 11,0 | 18,8 | 22,7 | 36,0 | 49,5 | 64,3 | 76,2 |
| | Shear | $V_{Rd,eq,C1}$ | [kN] | 6,2 | 9,5 | 14,0 | 26,3 | 41,4 | 59,4 | 77,3 | 94,1 |
| Steel 8.8 | Tensile | $N_{Rd,eq,C1}$ | [kN] | 7,8 | 11,0 | 18,8 | 22,7 | 36,0 | 49,5 | 64,3 | 76,2 |
| | Shear | $V_{Rd,eq,C1}$ | [kN] | 8,4 | 12,9 | 19,0 | 35,3 | 54,9 | 79,0 | 103,0 | 125,4 |
| A4-50 | Tensile | $N_{Rd,eq,C1}$ | [kN] | 6,3 | 10,1 | 14,7 | 22,7 | 36,0 | 49,5 | 64,3 | 76,2 |
| | Shear | $V_{Rd,eq,C1}$ | [kN] | 2,6 | 4,4 | 6,2 | 11,5 | 17,9 | 25,9 | 33,8 | 41,2 |
| A4-70 | Tensile | $N_{Rd,eq,C1}$ | [kN] | 7,8 | 11,0 | 18,8 | 22,7 | 36,0 | 49,5 | - | - |
| | Shear | $V_{Rd,eq,C1}$ | [kN] | 5,8 | 9,0 | 13,5 | 24,7 | 38,6 | 55,6 | - | - |


## Design Resistance Dry/Wet Holes in case of seismic performance category C2 (Hammer/Hollow Drilling)

Steel Decisive

| Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 8.8 | Tensile | $N_{Rd,eq,C2}$ | [kN] | - | - | 16,0 | 20,1 | 35,6 | 53,8 | - | - |
| | Shear | $V_{Rd,eq,C2}$ | [kN] | - | - | 19,0 | 34,2 | 54,9 | 79,0 | - | - |
| A4-70 | Tensile | $N_{Rd,eq,C2}$ | [kN] | - | - | 16,0 | 20,1 | 35,6 | 53,8 | - | - |
| | Shear | $V_{Rd,eq,C2}$ | [kN] | - | - | 13,5 | 24,7 | 38,6 | 55,6 | - | - |

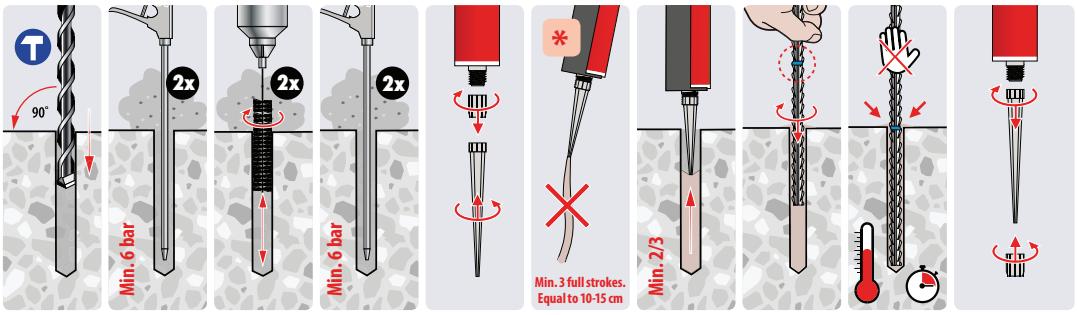
## Design Resistance Flooded Holes in case of seismic performance category C2 (Hammer/Hollow Drilling)

| Cracked Concrete | | Da | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel 8.8 | Tensile | $N_{Rd,eq,C2}$ | [kN] | - | - | 13,4 | 16,8 | 29,7 | 44,9 | - | - |
| | Shear | $V_{Rd,eq,C2}$ | [kN] | - | - | 19,0 | 34,2 | 54,9 | 79,0 | - | - |
| A4-70 | Tensile | $N_{Rd,eq,C2}$ | [kN] | - | - | 13,4 | 16,8 | 29,7 | 44,9 | - | - |
| | Shear | $V_{Rd,eq,C2}$ | [kN] | - | - | 13,5 | 24,7 | 38,6 | 55,6 | - | - |

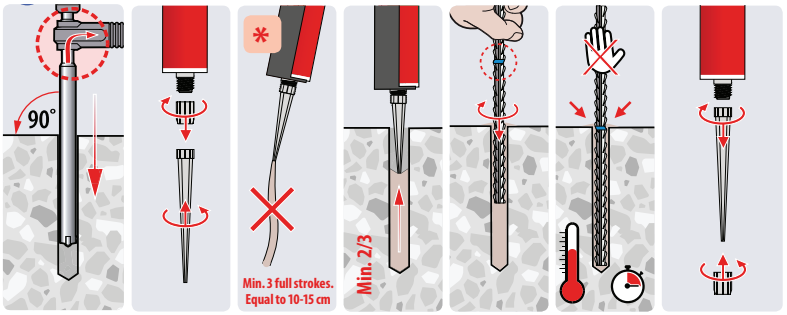
**Combined tension and shear loading** in accordance with EN 1992-4:2018 and AS 5216 please refer to ICCONS DesignPRO software or contact Iccons engineering department **engineering@iccons.com.au** for further information.

# REINFORCING BARS

## Installation Procedures (Hammer Drilling)

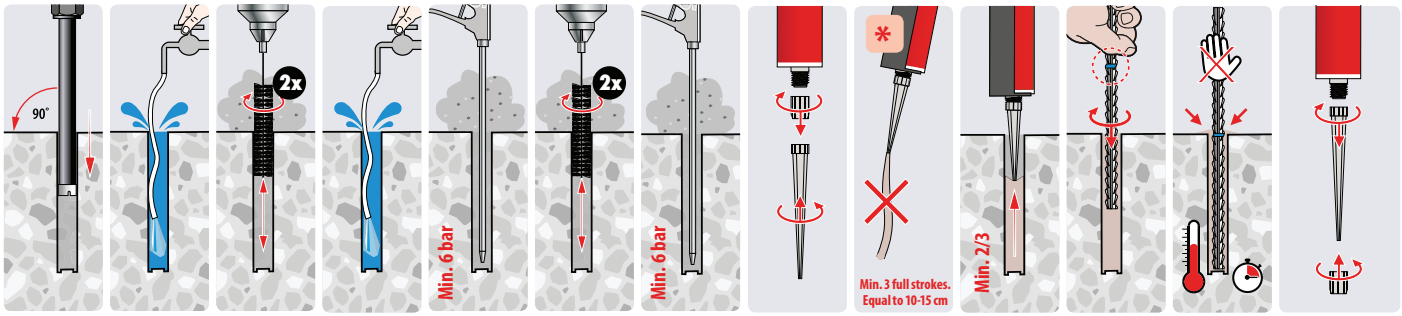



## Installation Procedures (Hollow Drilling)




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

## Installation Procedures (Diamond Drilling)



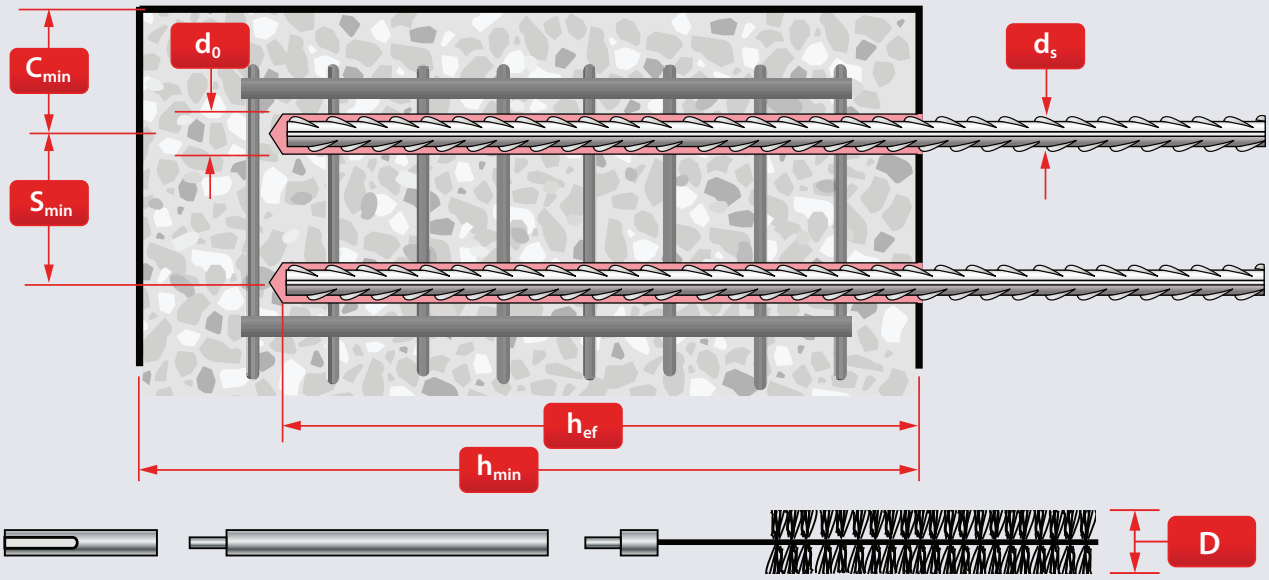

## Curing Times[1)]

| 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 | 48 h | 28 h | 18 h | 12 h | 9 h | 6 h | 4 h |
| Curing Time Wet Holes | 96 h | 56 h | 36 h | 24 h | 18 h | 12 h | 8 h |

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

ETA - 19/0850

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




## Installation Dimensions

| Rebar Size | $d_{nom}$ | | Ø8 | | Ø10 | | Ø12 | | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Min. Eff. Anchorage Depth | $h_{ef,min}$ | [mm] | 60 | | 60 | | 70 | | 75 | 80 | 90 | 96 | 100 | 112 | 128 |
| Max. Eff. Anchorage Depth | $h_{ef,max}$ | [mm] | 160 | | 200 | | 240 | | 280 | 320 | 400 | 480 | 500 | 560 | 640 |
| Hole Diameter | $d_0$ | [mm] | 10 | 12 | 12 | 14 | 14 | 16 | 18 | 20 | 25 | 32 | 32 | 35 | 40 |
| Required Volume per cm Embedment Depth | $V_s$ | [ml/cm] | 0,34 | 0,75 | 0,41 | 0,90 | 0,49 | 1,06 | 1,21 | 1,36 | 2,12 | 4,22 | 3,76 | 4,16 | 5,43 |

## Member Thickness, Edge Distance & Spacing

| Rebar Size | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 50 | 60 | 70 | 70 | 75 | 85 |
| Min. Spacing | $S_{min}$ | [mm] | 40 | 50 | 60 | 70 | 75 | 95 | 120 | 120 | 130 | 150 |

## Steel Brush & Piston Plug Dimensions

| Rebar Size | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brush Diameter | D | [mm] | 13,5 | 15,5 | 17,5 | 20,0 | 20,0 | 27,0 | 34,0 | 34,0 | 37,0 | 43,5 |
| Min. Brush Diameter | $D_{min}$ | [mm] | 12,5 | 14,5 | 16,5 | 18,5 | 20,5 | 25,5 | 32,5 | 32,5 | 35,5 | 40,5 |
| Piston Plug | # | -- | No piston plug required | | | 18 | 20 | 25 | 32 | 32 | 35 | 40 |

# Static and quasi-static resistance for a service life of 50 years (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.
- $\psi_{sus}$ = 1,0 according EN 1992-4:2018; eq. 7.14a.
- Recommended loads are with overal partial safety factor for action $\gamma_G$ = 1,4. The partial safety factors for action depend on the type of loading and shall be taken from national regulations.

HD HAMMER

## Design Resistance Dry/Wet Holes (Hammer Drilled)

Steel Decisive

| Non-Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{Rd,min}$ | [kN] | 15,2 | 15,2 | 19,2 | 21,3 | 23,5 | 28,0 | 30,8 | 32,8 | 38,9 | 47,5 |
| | Tensile Max. | $N_{Rd,max}$ | [kN] | 19,6 | 31,0 | 44,4 | 60,5 | 79,0 | 123,4 | 177,6 | 192,9 | 242,0 | 315,9 |
| | Shear Min. | $V_{Rd,min}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 56,0 | 61,7 | 65,6 | 77,7 | 95,0 |
| | Shear Max. | $V_{Rd,max}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 57,6 | 82,9 | 90,0 | 112,9 | 147,4 |

| Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{Rd,min}$ | [kN] | 7,0 | 8,8 | 13,4 | 14,9 | 16,4 | 19,6 | 21,6 | 23,0 | 27,2 | 33,2 |
| | Tensile Max. | $N_{Rd,max}$ | [kN] | 18,8 | 29,3 | 44,4 | 60,5 | 79,0 | 123,4 | 177,6 | 192,9 | 242,0 | 315,9 |
| | Shear Min. | $V_{Rd,min}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 32,9 | 39,2 | 43,2 | 45,9 | 54,4 | 66,5 |
| | Shear Max. | $V_{Rd,max}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 57,6 | 82,9 | 90,0 | 112,9 | 147,4 |

## Design Resistance Flooded Holes (Hammer Drilled)

| Non-Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{Rd,min}$ | [kN] | 12,7 | 12,7 | 16,0 | 17,8 | 19,6 | 23,3 | 25,7 | 27,3 | 32,4 | 39,6 |
| | Tensile Max. | $N_{Rd,max}$ | [kN] | 19,6 | 31,0 | 44,4 | 60,5 | 79,0 | 123,4 | 177,6 | 192,9 | 242,0 | 315,9 |
| | Shear Min. | $V_{Rd,min}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 56,0 | 61,7 | 65,6 | 77,7 | 95,0 |
| | Shear Max. | $V_{Rd,max}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 57,6 | 82,9 | 90,0 | 112,9 | 147,4 |

| Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{Rd,min}$ | [kN] | 5,9 | 7,3 | 11,2 | 12,4 | 13,7 | 16,3 | 18,0 | 19,1 | 22,7 | 27,7 |
| | Tensile Max. | $N_{Rd,max}$ | [kN] | 15,6 | 24,4 | 42,7 | 58,2 | 76,0 | 118,7 | 170,9 | 185,4 | 232,6 | 303,8 |
| | Shear Min. | $V_{Rd,min}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 32,9 | 39,2 | 43,2 | 45,9 | 54,4 | 66,5 |
| | Shear Max. | $V_{Rd,max}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 57,6 | 82,9 | 90,0 | 112,9 | 147,4 |

## Recommended Loads Dry/Wet Holes (Hammer Drilled)

| Non-Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{rec,min}$ | [kN] | 10,9 | 10,9 | 13,7 | 15,2 | 16,8 | 20,0 | 22,0 | 23,4 | 27,8 | 33,9 |
| | Tensile Max. | $N_{rec,max}$ | [kN] | 14,0 | 22,2 | 31,7 | 43,2 | 56,4 | 88,1 | 126,8 | 137,8 | 172,9 | 225,6 |
| | Shear Min. | $V_{rec,min}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 40,0 | 44,1 | 46,9 | 55,5 | 67,8 |
| | Shear Max. | $V_{rec,max}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 41,1 | 59,2 | 64,3 | 80,7 | 105,3 |

| Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{rec,min}$ | [kN] | 5,0 | 6,3 | 9,6 | 10,7 | 11,7 | 14,0 | 15,4 | 16,4 | 19,4 | 23,7 |
| | Tensile Max. | $N_{rec,max}$ | [kN] | 13,4 | 20,9 | 31,7 | 43,2 | 56,4 | 88,1 | 126,8 | 137,8 | 172,9 | 225,6 |
| | Shear Min. | $V_{rec,min}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 23,5 | 28,0 | 30,8 | 32,8 | 38,9 | 47,5 |
| | Shear Max. | $V_{rec,max}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 41,1 | 59,2 | 64,3 | 80,7 | 105,3 |

## Recommended Loads Flooded Holes (Hammer Drilled)

| Non-Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{rec,min}$ | [kN] | 9,1 | 9,1 | 11,4 | 12,7 | 14,0 | 16,7 | 18,4 | 19,5 | 23,1 | 28,3 |
| | Tensile Max. | $N_{rec,max}$ | [kN] | 14,0 | 22,2 | 31,7 | 43,2 | 56,4 | 88,1 | 126,8 | 137,8 | 172,9 | 225,6 |
| | Shear Min. | $V_{rec,min}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 40,0 | 44,1 | 46,9 | 55,5 | 67,8 |
| | Shear Max. | $V_{rec,max}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 41,1 | 59,2 | 64,3 | 80,7 | 105,3 |

| Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{rec,min}$ | [kN] | 4,2 | 5,2 | 8,0 | 8,9 | 9,8 | 11,7 | 12,9 | 13,7 | 16,2 | 19,8 |
| | Tensile Max. | $N_{rec,max}$ | [kN] | 11,2 | 17,5 | 30,5 | 41,5 | 54,3 | 84,8 | 122,1 | 132,5 | 166,2 | 217,0 |
| | Shear Min. | $V_{rec,min}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 23,5 | 28,0 | 30,8 | 32,8 | 38,9 | 47,5 |
| | Shear Max. | $V_{rec,max}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 41,1 | 59,2 | 64,3 | 80,7 | 105,3 |

**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 **engineering@iccons.com.au** for further information.

HDB HAMMER

## Design Resistance Dry/Wet Holes (Hollow Drilling)

Steel Decisive

| Non-Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{Rd,min}$ | [kN] | 14,1 | 15,2 | 19,2 | 21,3 | 23,5 | 28,0 | 30,8 | 32,8 | 38,9 | 47,5 |
| | Tensile Max. | $N_{Rd,max}$ | [kN] | 19,6 | 31,0 | 44,4 | 60,5 | 79,0 | 123,4 | 177,6 | 192,9 | 242,0 | 315,9 |
| | Shear Min. | $V_{Rd,min}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 56,0 | 61,7 | 65,6 | 77,7 | 95,0 |
| | Shear Max. | $V_{Rd,max}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 57,6 | 82,9 | 90,0 | 112,9 | 147,4 |

| Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{Rd,min}$ | [kN] | 7,0 | 8,8 | 13,4 | 14,9 | 16,4 | 19,6 | 21,6 | 23,0 | 27,2 | 33,2 |
| | Tensile Max. | $N_{Rd,max}$ | [kN] | 18,8 | 29,3 | 44,4 | 60,5 | 79,0 | 123,4 | 177,6 | 192,9 | 242,0 | 315,9 |
| | Shear Min. | $V_{Rd,min}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 32,9 | 39,2 | 43,2 | 45,9 | 54,4 | 66,5 |
| | Shear Max. | $V_{Rd,max}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 57,6 | 82,9 | 90,0 | 112,9 | 147,4 |

HAMMER

## Design Resistance Flooded Holes (Hollow Drilling)

Steel Decisive

| Non-Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{Rd,min}$ | [kN] | 10,9 | 12,7 | 16,0 | 17,8 | 19,6 | 23,3 | 25,7 | 27,3 | 32,4 | 39,6 |
| | Tensile Max. | $N_{Rd,max}$ | [kN] | 19,6 | 31,0 | 44,4 | 60,5 | 79,0 | 123,4 | 177,6 | 192,9 | 242,0 | 315,9 |
| | Shear Min. | $V_{Rd,min}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 56,0 | 61,7 | 65,6 | 77,7 | 95,0 |
| | Shear Max. | $V_{Rd,max}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 57,6 | 82,9 | 90,0 | 112,9 | 147,4 |

| Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{Rd,min}$ | [kN] | 5,9 | 7,3 | 11,2 | 12,4 | 13,7 | 16,3 | 18,0 | 19,1 | 22,7 | 27,7 |
| | Tensile Max. | $N_{Rd,max}$ | [kN] | 15,6 | 24,4 | 42,7 | 58,2 | 76,0 | 118,7 | 170,9 | 185,4 | 232,6 | 303,8 |
| | Shear Min. | $V_{Rd,min}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 32,9 | 39,2 | 43,2 | 45,9 | 54,4 | 66,5 |
| | Shear Max. | $V_{Rd,max}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 57,6 | 82,9 | 90,0 | 112,9 | 147,4 |

## Recommended Loads Dry/Wet Holes (Hollow Drilling)

| Non-Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{rec,min}$ | [kN] | 10,1 | 10,9 | 13,7 | 15,2 | 16,8 | 20,0 | 22,0 | 23,4 | 27,8 | 33,9 |
| | Tensile Max. | $N_{rec,max}$ | [kN] | 14,0 | 22,2 | 31,7 | 43,2 | 56,4 | 88,1 | 126,8 | 137,8 | 172,9 | 225,6 |
| | Shear Min. | $V_{rec,min}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 40,0 | 44,1 | 46,9 | 55,5 | 67,8 |
| | Shear Max. | $V_{rec,max}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 41,1 | 59,2 | 64,3 | 80,7 | 105,3 |

| Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{rec,min}$ | [kN] | 5,0 | 6,3 | 9,6 | 10,7 | 11,7 | 14,0 | 15,4 | 16,4 | 19,4 | 23,7 |
| | Tensile Max. | $N_{rec,max}$ | [kN] | 13,4 | 20,9 | 31,7 | 43,2 | 56,4 | 88,1 | 126,8 | 137,8 | 172,9 | 225,6 |
| | Shear Min. | $V_{rec,min}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 23,5 | 28,0 | 30,8 | 32,8 | 38,9 | 47,5 |
| | Shear Max. | $V_{rec,max}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 41,1 | 59,2 | 64,3 | 80,7 | 105,3 |

## Recommended Loads Flooded Holes (Hollow Drilling)

| Non-Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{rec,min}$ | [kN] | 7,8 | 9,1 | 11,4 | 12,7 | 14,0 | 16,7 | 18,4 | 19,5 | 23,1 | 28,3 |
| | Tensile Max. | $N_{rec,max}$ | [kN] | 14,0 | 22,2 | 31,7 | 43,2 | 56,4 | 88,1 | 126,8 | 137,8 | 172,9 | 225,6 |
| | Shear Min. | $V_{rec,min}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 40,0 | 44,1 | 46,9 | 55,5 | 67,8 |
| | Shear Max. | $V_{rec,max}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 41,1 | 59,2 | 64,3 | 80,7 | 105,3 |

| Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{rec,min}$ | [kN] | 4,2 | 5,2 | 8,0 | 8,9 | 9,8 | 11,7 | 12,9 | 13,7 | 16,2 | 19,8 |
| | Tensile Max. | $N_{rec,max}$ | [kN] | 11,2 | 17,5 | 30,5 | 41,5 | 54,3 | 84,8 | 122,1 | 132,5 | 166,2 | 217,0 |
| | Shear Min. | $V_{rec,min}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 23,5 | 28,0 | 30,8 | 32,8 | 38,9 | 47,5 |
| | Shear Max. | $V_{rec,max}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 41,1 | 59,2 | 64,3 | 80,7 | 105,3 |

**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 **engineering@iccons.com.au** for further information.

DD DIAMOND

## Design Resistance Dry/Wet Holes (Diamond Drilled)

Steel Decisive

| Non-Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{Rd,min}$ | [kN] | 14,1 | 15,2 | 19,2 | 21,3 | 23,5 | 28,0 | 30,8 | 32,8 | 38,9 | 47,5 |
| | Tensile Max. | $N_{Rd,max}$ | [kN] | 19,6 | 31,0 | 44,4 | 60,5 | 79,0 | 123,4 | 177,6 | 192,9 | 242,0 | 315,9 |
| | Shear Min. | $V_{Rd,min}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 56,0 | 61,7 | 65,6 | 77,7 | 95,0 |
| | Shear Max. | $V_{Rd,max}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 57,6 | 82,9 | 90,0 | 112,9 | 147,4 |

## Design Resistance Flooded Holes (Diamond Drilled)

| Non-Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{Rd,min}$ | [kN] | 11,7 | 12,7 | 16,0 | 17,8 | 16,8 | 20,0 | 22,0 | 23,4 | 27,8 | 33,9 |
| | Tensile Max. | $N_{Rd,max}$ | [kN] | 19,6 | 31,0 | 44,4 | 60,5 | 79,0 | 123,4 | 177,6 | 192,9 | 242,0 | 315,9 |
| | Shear Min. | $V_{Rd,min}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 56,0 | 61,7 | 65,6 | 77,7 | 95,0 |
| | Shear Max. | $V_{Rd,max}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 57,6 | 82,9 | 90,0 | 112,9 | 147,4 |

## Recommended Loads Dry/Wet Holes (Diamond Drilled)

| Non-Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{rec,min}$ | [kN] | 10,1 | 10,9 | 13,7 | 15,2 | 16,8 | 20,0 | 22,0 | 23,4 | 27,8 | 33,9 |
| | Tensile Max. | $N_{rec,max}$ | [kN] | 14,0 | 22,2 | 31,7 | 43,2 | 56,4 | 88,1 | 126,8 | 137,8 | 172,9 | 225,6 |
| | Shear Min. | $V_{rec,min}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 40,0 | 44,1 | 46,9 | 55,5 | 67,8 |
| | Shear Max. | $V_{rec,max}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 41,1 | 59,2 | 64,3 | 80,7 | 105,3 |

## Recommended Loads Flooded Holes (Diamond Drilled)

| Non-Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{rec,min}$ | [kN] | 8,4 | 9,1 | 11,4 | 12,7 | 12,0 | 14,3 | 15,7 | 16,7 | 19,8 | 24,2 |
| | Tensile Max. | $N_{rec,max}$ | [kN] | 14,0 | 22,2 | 31,7 | 43,2 | 56,4 | 88,1 | 126,8 | 137,8 | 172,9 | 225,6 |
| | Shear Min. | $V_{rec,min}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 40,0 | 44,1 | 46,9 | 55,5 | 67,8 |
| | Shear Max. | $V_{rec,max}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 41,1 | 59,2 | 64,3 | 80,7 | 105,3 |

**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 **engineering@iccons.com.au** for further information.

## Seismic resistance for a service life of 50 years (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.
- $\alpha_{gap}$ = 1,0 (using special filling washer according ETA-19/0850 Annex A 3).
- Increasing factor for concrete $\psi_c$: C25/30 to C50/60 = 1,0


### Design Resistance Dry/Wet Holes in case of seismic performance category C1

**Steel Decisive**

| Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{Rd,eq,min}$ | [kN] | 7,0 | 8,8 | 11,4 | 12,7 | 14,0 | 16,7 | 18,4 | 19,5 | 23,1 | 28,3 |
| | Tensile Max. | $N_{Rd,eq,max}$ | [kN] | 18,8 | 29,3 | 44,4 | 60,5 | 79,0 | 123,4 | 177,6 | 192,9 | 242,0 | 315,9 |
| | Shear Min. | $V_{Rd,eq,min}$ | [kN] | 6,4 | 10,1 | 14,5 | 19,8 | 25,8 | 33,3 | 36,7 | 39,0 | 46,3 | 56,5 |
| | Shear Max. | $V_{Rd,eq,max}$ | [kN] | 6,4 | 10,1 | 14,5 | 19,8 | 25,8 | 40,3 | 58,0 | 63,0 | 79,1 | 103,2 |

### Design Resistance Flooded holes in case of seismic performance category C1

| Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{Rd,eq,min}$ | [kN] | 5,9 | 6,4 | 8,1 | 9,0 | 9,9 | 11,8 | 13,0 | 13,8 | 16,4 | 20,0 |
| | Tensile Max. | $N_{Rd,eq,max}$ | [kN] | 15,6 | 24,4 | 42,7 | 58,2 | 76,0 | 110,6 | 145,4 | 154,5 | 183,2 | 223,8 |
| | Shear Min. | $V_{Rd,eq,min}$ | [kN] | 6,4 | 10,1 | 14,5 | 19,8 | 25,8 | 33,3 | 36,7 | 39,0 | 46,3 | 56,5 |
| | Shear Max. | $V_{Rd,eq,max}$ | [kN] | 6,4 | 10,1 | 14,5 | 19,8 | 25,8 | 40,3 | 58,0 | 63,0 | 79,1 | 103,2 |

**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 **engineering@iccons.com.au** for further information.

# Static and quasi-static resistance for a service life of 100 years (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.
- $\psi_{sus}$ = 1,0 according EN 1992-4:2018; eq. 7.14a.
- Recommended loads are with overal partial safety factor for action $\gamma_G$ = 1,4. The partial safety factors for action depend on the type of loading and shall be taken from national regulations.

HD HAMMER

100+ YEAR DESIGN LIFE

## Design Resistance Dry/Wet Holes (Hammer Drilled)

Steel Decisive

| Non-Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{Rd,min}$ | [kN] | 15,2 | 15,2 | 19,2 | 21,3 | 23,5 | 28,0 | 30,8 | 32,8 | 38,9 | 47,5 |
| | Tensile Max. | $N_{Rd,max}$ | [kN] | 19,6 | 31,0 | 44,4 | 60,5 | 79,0 | 123,4 | 177,6 | 192,9 | 242,0 | 315,9 |
| | Shear Min. | $V_{Rd,min}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 56,0 | 61,7 | 65,6 | 77,7 | 95,0 |
| | Shear Max. | $V_{Rd,max}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 57,6 | 82,9 | 90,0 | 112,9 | 147,4 |

## Design Resistance Flooded Holes (Hammer Drilled)

| Non-Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{Rd,min}$ | [kN] | 12,7 | 12,7 | 16,0 | 17,8 | 19,6 | 23,3 | 25,7 | 27,3 | 32,4 | 39,6 |
| | Tensile Max. | $N_{Rd,max}$ | [kN] | 19,6 | 31,0 | 44,4 | 60,5 | 79,0 | 123,4 | 177,6 | 192,9 | 242,0 | 315,9 |
| | Shear Min. | $V_{Rd,min}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 56,0 | 61,7 | 65,6 | 77,7 | 95,0 |
| | Shear Max. | $V_{Rd,max}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 57,6 | 82,9 | 90,0 | 112,9 | 147,4 |

## Recommended Loads Dry/Wet Holes (Hammer Drilled)

| Non-Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{rec,min}$ | [kN] | 10,9 | 10,9 | 13,7 | 15,2 | 16,8 | 20,0 | 22,0 | 23,4 | 27,8 | 33,9 |
| | Tensile Max. | $N_{rec,max}$ | [kN] | 14,0 | 22,2 | 31,7 | 43,2 | 56,4 | 88,1 | 126,8 | 137,8 | 172,9 | 225,6 |
| | Shear Min. | $V_{rec,min}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 40,0 | 44,1 | 46,9 | 55,5 | 67,8 |
| | Shear Max. | $V_{rec,max}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 41,1 | 59,2 | 64,3 | 80,7 | 105,3 |

## Recommended Loads Flooded Holes (Hammer Drilled)

| Non-Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{rec,min}$ | [kN] | 9,1 | 9,1 | 11,4 | 12,7 | 14,0 | 16,7 | 18,4 | 19,5 | 23,1 | 28,3 |
| | Tensile Max. | $N_{rec,max}$ | [kN] | 14,0 | 22,2 | 31,7 | 43,2 | 56,4 | 88,1 | 126,8 | 137,8 | 172,9 | 225,6 |
| | Shear Min. | $V_{rec,min}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 40,0 | 44,1 | 46,9 | 55,5 | 67,8 |
| | Shear Max. | $V_{rec,max}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 41,1 | 59,2 | 64,3 | 80,7 | 105,3 |

HAMMER

100+ YEAR DESIGN LIFE

## Design Resistance Dry/Wet Holes (Hollow Drilling)

Steel Decisive

| Non-Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{Rd,min}$ | [kN] | 14,1 | 15,2 | 19,2 | 21,3 | 23,5 | 28,0 | 30,8 | 32,8 | 38,9 | 47,5 |
| | Tensile Max. | $N_{Rd,max}$ | [kN] | 19,6 | 31,0 | 44,4 | 60,5 | 79,0 | 123,4 | 177,6 | 192,9 | 242,0 | 315,9 |
| | Shear Min. | $V_{Rd,min}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 56,0 | 61,7 | 65,6 | 77,7 | 95,0 |
| | Shear Max. | $V_{Rd,max}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 57,6 | 82,9 | 90,0 | 112,9 | 147,4 |

## Design Resistance Flooded Holes (Hollow Drilling)

| Non-Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{Rd,min}$ | [kN] | 10,9 | 12,7 | 16,0 | 17,8 | 19,6 | 23,3 | 25,7 | 27,3 | 32,4 | 39,6 |
| | Tensile Max. | $N_{Rd,max}$ | [kN] | 19,6 | 31,0 | 44,4 | 60,5 | 79,0 | 123,4 | 177,6 | 192,9 | 242,0 | 315,9 |
| | Shear Min. | $V_{Rd,min}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 56,0 | 61,7 | 65,6 | 77,7 | 95,0 |
| | Shear Max. | $V_{Rd,max}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 57,6 | 82,9 | 90,0 | 112,9 | 147,4 |

## Recommended Loads Dry/Wet Holes (Hollow Drilling)

| Non-Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{rec,min}$ | [kN] | 10,1 | 10,9 | 13,7 | 15,2 | 16,8 | 20,0 | 22,0 | 23,4 | 27,8 | 33,9 |
| | Tensile Max. | $N_{rec,max}$ | [kN] | 14,0 | 22,2 | 31,7 | 43,2 | 56,4 | 88,1 | 126,8 | 137,8 | 172,9 | 225,6 |
| | Shear Min. | $V_{rec,min}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 40,0 | 44,1 | 46,9 | 55,5 | 67,8 |
| | Shear Max. | $V_{rec,max}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 41,1 | 59,2 | 64,3 | 80,7 | 105,3 |

## Recommended Loads Flooded Holes (Hollow Drilling)

| Non-Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{rec,min}$ | [kN] | 7,8 | 9,1 | 11,4 | 12,7 | 14,0 | 16,7 | 18,4 | 19,5 | 23,1 | 28,3 |
| | Tensile Max. | $N_{rec,max}$ | [kN] | 14,0 | 22,2 | 31,7 | 43,2 | 56,4 | 88,1 | 126,8 | 137,8 | 172,9 | 225,6 |
| | Shear Min. | $V_{rec,min}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 40,0 | 44,1 | 46,9 | 55,5 | 67,8 |
| | Shear Max. | $V_{rec,max}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 41,1 | 59,2 | 64,3 | 80,7 | 105,3 |

**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 **engineering@iccons.com.au** for further information.


## Design Resistance Dry/Wet Holes (Hammer/Hollow Drilling)

Steel Decisive

| Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{Rd,min}$ | [kN] | 6,5 | 8,2 | 13,2 | 14,9 | 16,4 | 19,6 | 21,6 | 23,0 | 27,2 | 33,2 |
| | Tensile Max. | $N_{Rd,max}$ | [kN] | 17,4 | 27,2 | 44,4 | 60,5 | 79,0 | 123,4 | 177,6 | 192,9 | 242,0 | 315,9 |
| | Shear Min. | $V_{Rd,min}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 32,9 | 39,2 | 43,2 | 45,9 | 54,4 | 66,5 |
| | Shear Max. | $V_{Rd,max}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 57,6 | 82,9 | 90,0 | 112,9 | 147,4 |

## Design Resistance Flooded Holes (Hammer/Hollow Drilling)

| Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{Rd,min}$ | [kN] | 5,4 | 6,8 | 11,0 | 12,4 | 13,7 | 16,3 | 18,0 | 19,1 | 22,7 | 27,7 |
| | Tensile Max. | $N_{Rd,max}$ | [kN] | 14,5 | 22,7 | 37,7 | 51,3 | 67,0 | 104,7 | 150,8 | 163,6 | 205,3 | 268,1 |
| | Shear Min. | $V_{Rd,min}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 32,9 | 39,2 | 43,2 | 45,9 | 54,4 | 66,5 |
| | Shear Max. | $V_{Rd,max}$ | [kN] | 9,2 | 14,5 | 20,7 | 28,2 | 36,9 | 57,6 | 82,9 | 90,0 | 112,9 | 147,4 |

## Recommended Loads Dry/Wet Holes (Hammer/Hollow Drilling)

| Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{rec,min}$ | [kN] | 4,7 | 5,8 | 9,44 | 10,7 | 11,7 | 14,0 | 15,4 | 16,4 | 19,4 | 23,7 |
| | Tensile Max. | $N_{rec,max}$ | [kN] | 12,4 | 19,4 | 31,7 | 43,2 | 56,4 | 88,1 | 126,8 | 137,8 | 172,9 | 225,6 |
| | Shear Min. | $V_{rec,min}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 23,5 | 28,0 | 30,8 | 32,8 | 38,9 | 47,5 |
| | Shear Max. | $V_{rec,max}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 41,1 | 59,2 | 64,3 | 80,7 | 105,3 |

## Recommended Loads Flooded Holes (Hammer/Hollow Drilling)

| Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{rec,min}$ | [kN] | 3,9 | 4,9 | 7,9 | 8,9 | 9,8 | 11,7 | 12,9 | 13,7 | 16,2 | 19,8 |
| | Tensile Max. | $N_{rec,max}$ | [kN] | 10,4 | 16,2 | 26,9 | 36,7 | 47,9 | 74,8 | 107,7 | 116,9 | 146,6 | 191,5 |
| | Shear Min. | $V_{rec,min}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 23,5 | 28,0 | 30,8 | 32,8 | 38,9 | 47,5 |
| | Shear Max. | $V_{rec,max}$ | [kN] | 6,5 | 10,3 | 14,8 | 20,2 | 26,3 | 41,1 | 59,2 | 64,3 | 80,7 | 105,3 |

**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 **engineering@iccons.com.au** for further information.

## Seismic resistance for a service life of 100 years (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.
- $\alpha_{gap}$ = 1,0 (using special filling washer according ETA-19/0850 Annex A 3).
- Increasing factor for concrete $\psi_c$: C25/30 to C50/60 = 1,0


## Design Resistance Dry/Wet Holes in case of seismic performance category C1 (Hammer/Hollow Drilling)

| Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{Rd,eq,min}$ | [kN] | 7,0 | 8,8 | 11,4 | 12,7 | 14,0 | 16,7 | 18,4 | 19,5 | 23,1 | 28,3 |
| | Tensile Max. | $N_{Rd,eq,max}$ | [kN] | 18,8 | 29,3 | 44,4 | 60,5 | 79,0 | 123,4 | 177,6 | 192,9 | 242,0 | 315,9 |
| | Shear Min. | $V_{Rd,eq,min}$ | [kN] | 6,4 | 10,1 | 14,5 | 19,8 | 25,8 | 33,3 | 36,7 | 39,0 | 46,3 | 56,5 |
| | Shear Max. | $V_{Rd,eq,max}$ | [kN] | 6,4 | 10,1 | 14,5 | 19,8 | 25,8 | 40,3 | 58,0 | 63,0 | 79,1 | 103,2 |

## Design Resistance Flooded holes in case of seismic performance category C1 (Hammer/Hollow Drilling)

| Cracked Concrete | | $d_{nom}$ | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø20 | Ø24 | Ø25 | Ø28 | Ø32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B500B | Tensile Min. | $N_{Rd,eq,min}$ | [kN] | 5,9 | 6,4 | 8,1 | 9,0 | 9,9 | 11,8 | 13,0 | 13,8 | 16,4 | 20,0 |
| | Tensile Max. | $N_{Rd,eq,max}$ | [kN] | 15,6 | 24,4 | 42,7 | 58,2 | 76,0 | 110,6 | 145,4 | 154,5 | 183,2 | 223,8 |
| | Shear Min. | $V_{Rd,eq,min}$ | [kN] | 6,4 | 10,1 | 14,5 | 19,8 | 25,8 | 33,3 | 36,7 | 39,0 | 46,3 | 56,5 |
| | Shear Max. | $V_{Rd,eq,max}$ | [kN] | 6,4 | 10,1 | 14,5 | 19,8 | 25,8 | 40,3 | 58,0 | 63,0 | 79,1 | 103,2 |

**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 **engineering@iccons.com.au** for further information.

## BIS-PE GEN3 Mortar Properties

B+BTec BIS-PE GEN3 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 B+BTec BIS-PE GEN3 are listed.

| Properties | Test Method | Result |
|---|---|---|
| Compressive strength | EN 196-1 | 122 N/mm² |
| Flexural strength | EN 196-1 | 66,0 N/mm² |
| Axial tensile strength | DIN EN ISO 527-2 | 44,2 N/mm² |
| E modulus | DIN EN ISO 527-2 | 6.300 N/mm² |
| Elongation at fracture | DIN EN ISO 527-2 | 1 % |
| Degree of shrinkage | DIN 52450 | ≤ 1,4 ‰ |
| Hardness Shore A | DIN EN ISO 868 | 99,4 |
| Hardness Shore D | DIN EN ISO 868 | 86,1 |
| Density | | ≤ 1,5 kg/dm³ |
| Thermal conductivity | DIN EN 993-15 | 0,50 W/mK |
| Heat capacity | DIN EN 993-15 | 1.350 J/kgK |
| Electrical resistance | DIN IEC 93 | $8{,}0 \cdot 10^{12}$ Ω |

## BIS-PE GEN3 Chemical Resistance

The resistance of the B+BTec BIS-PE GEN3 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 |
|---|---|---|---|
| Acetic acid (Vinegar) | 40 | | ■ |
| Acetone | 10 | | ■ |
| Ammonia, aqueous solution | 5 | ■ | |
| Aniline | 100 | | ■ |
| Beer | 100 | ■ | |
| Benzine (kp 100-140°F) | 100 | ■ | |
| Benzene | 100 | | ■ |
| Boric Acid, aqueous solution | | ■ | |
| Calcium carbonate, suspended in water | All | ■ | |
| Calcium chloride, suspended in water | | ■ | |
| Calcium hydroxide, suspended in water | | ■ | |
| Carbon tetrachloride | 100 | ■ | |
| Caustic soda (Sodium hydroxide) | 40 | ■ | |

Continued on next page ➔

| Chemical Agent | Concentration | Resistant | Not resistant |
|---|---|---|---|
| Citric acid | All | ■ | |
| Chlorine | All | ■ | |
| Diesel oil | 100 | ■ | |
| Ethyl alcohol, aqueous solution | 50 | | ■ |
| Formaldehyde, aqueous solution | 30 | ■ | |
| Formic acid (Methanoic acid) | 100 | | ■ |
| Formic acid (Methanoic acid) | 10 | ■ | |
| Freon | | ■ | |
| Fuel Oil | | ■ | |
| Gasoline (premium grade) | 100 | ■ | |
| Glycol (Ethylene glycol) | | ■ | |
| Hydrogen peroxide | 30 | | ■ |
| Hydrochloric acid (Muriatic Acid) | Conc. | | ■ |
| Isopropyl alcohol | 100 | | ■ |
| Lactic acid | All | | ■ |
| Laitance | | ■ | |
| Linseed oil | 100 | ■ | |
| Lubricating oil | 100 | ■ | |
| Magnesium chloride, aqueous solution | All | ■ | |
| Methanol | 100 | | ■ |
| Motor oil (SAE 20 W-50) | 100 | ■ | |
| Nitric acid | 10 | | ■ |
| Oleic acid | 100 | ■ | |
| Perchloroethylene | 100 | ■ | |
| Petroleum | 100 | ■ | |
| Phenol, aqueous solution (Carbonic acid) | 8 | | ■ |
| Phosphoric acid | 85 | ■ | |
| Phosphoric acid | 10 | ■ | |
| Potash lye (potassium hydroxide, 10% and 40% solutions) | | ■ | |
| Potassium carbonate, aqueous solution | All | ■ | |
| Potassium chlorite, aqueous solution | All | ■ | |
| Potassium nitrate, aqueous solution | All | ■ | |
| Sodium carbonate, aqueous solution | All | ■ | |
| Sodium chloride, aqueous solution | All | ■ | |
| Sodium phosphate, aqueous solution | All | ■ | |
| Sodium silicate | All | ■ | |
| Sulfuric acid | 30 | | ■ |
| Tartaric acid | All | ■ | |
| Tetrachloroethylene | 100 | ■ | |
| Toluene | | | ■ |
| Turpentine | 100 | ■ | |
| Trichloroethylene | 100 | | ■ |

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