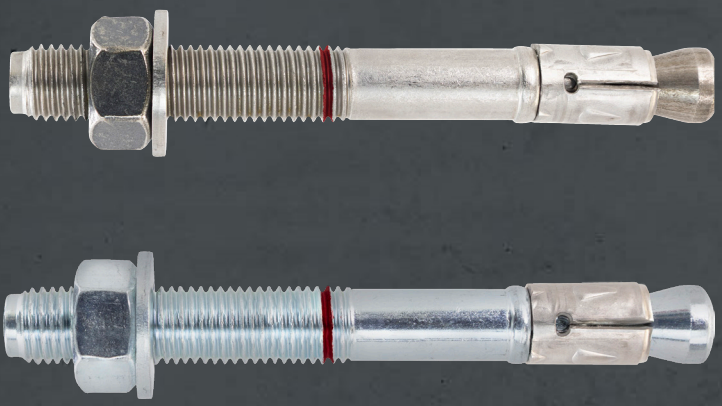
ETA-25/0120

# TDS | 1055.1

## THRU-BOLT™ ULTRA



THRU-BOLT™ ULTRA

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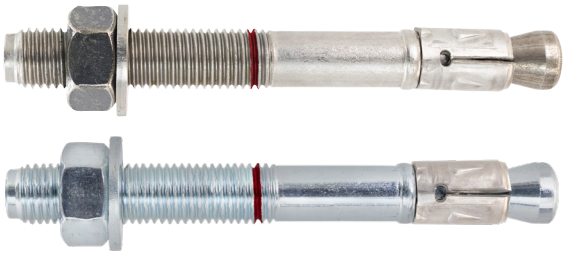
# THRU-BOLT™ ULTRA

ICCONS THRU-BOLT™ ULTRA sets a new benchmark for mechanical expansion anchors with its extreme tensile and shear load capacities and variable anchorage depths. It allows higher loads at standard embedment and even greater performance with deeper settings, while reduced depths minimize drilling effort and reinforcement hits. Its innovative design enables close edge and spacing distances, greater seismic performance, and faster installation with fewer turns and a visual depth indicator.



## FEATURES

- Highest approved tensile and shear loads
- Variable anchorage depths
- Shallow minimum anchorage depths
- ETA approved for cracked and non-cracked concrete
- Seismic categories C1/C2
- Fire resistance (R30-R120)
- Optional adhesive filling (with Filling Washer) for enhanced seismic performance
- Fast installation with fewer turns and coloured depth indicator
- Approved for Dynamic (shock) loads by Swiss Federal Office
- Suitable for Fiber-reinforced concrete (M8 and M10 sizes)
- M20 version requires minimal borehole cleaning (no brushing needed)

## BENEFITS

- Complies with AS 5216
- NCC compliant
- ETA Assessed
- Suitable for cracked and uncracked concrete
- Fire Rated
- Seismic assessed C1& C2
- Flexible design using AS 5216 compliant software - DESIGN PRO
- Available in sizes M8 - M20

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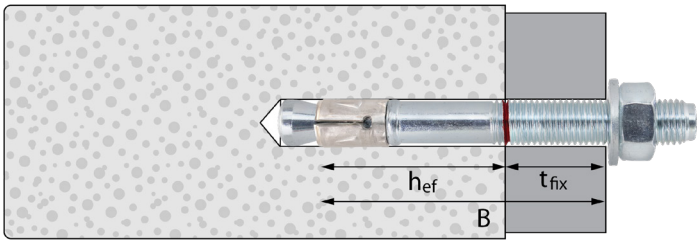
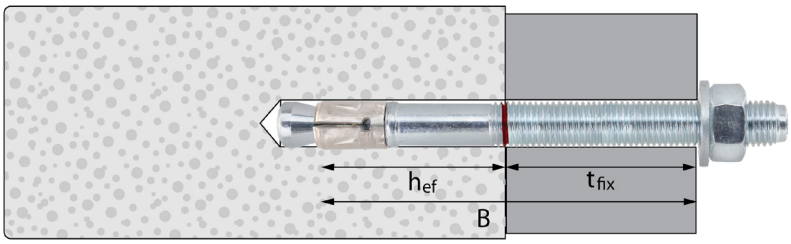
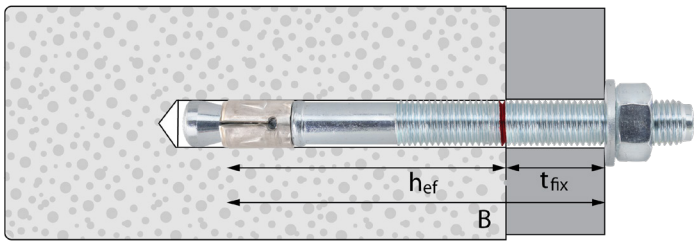
## EXAMPLES OF INSTALLATION



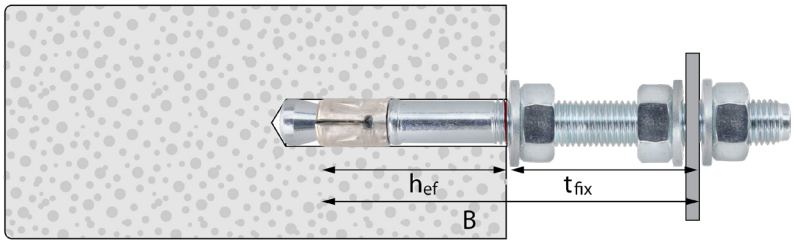

Small effective anchorage depth and small clamping thickness.




Small anchorage depth and large flexible clamping thickness




Large anchorage depth and small fixture thickness




Stand-off fastening

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## APPLICATIONS

The THRU-BOLT™ ULTRA is designed for anchoring medium to heavy-duty loads in both cracked and non-cracked concrete, making it ideal for a wide variety of structural and non-structural applications.
Typical uses include:

- **Structural steelwork:** anchoring of steel columns, base plates, and steel beams
- **Infrastructure and industrial installations:** secure mounting of railings, guardrails, safety barriers, and gantries
- **MEP systems:** reliable fixation of cable trays, cable ladders, pipe supports, HVAC ducts, and utility channels
- **Timber construction:** anchoring of heavy timber posts, beams, and framework into concrete substrates
- **Architectural elements:** mounting of cladding systems, curtain walls, and facade support brackets
- **Support structures and consoles:** fixing of heavy-duty brackets, shelving systems, and equipment supports
- **Seismic zones:** engineered for use in earthquake-prone areas, with performance approved under seismic categories C1 and C2

With its high load capacity, flexible installation depths, and multiple approvals, the THRU-BOLT™ ULTRA offers a versatile and dependable solution for demanding construction and engineering applications.

  

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## THRU-BOLT™ ULTRA

☐ ZINC CLEAR

■ 316 STAINLESS STEEL (A4)

| Zinc Clear Part No. | 316 Stainless Steel (A4) Part No. | Description | Drill Diameter (mm) | Min. Drill Depth (mm) | Min. Anchor Embedment $h_{nom}$ (mm) | Max. Fixture Thickness $t_{fix}$ (mm) | Head/ Socket Size (mm) | Installation Torque Zinc / A4 (Nm) | ETA Option | SEISMIC Assessment | qty. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **TBU08065** | **TBU08065SS** | 8 x 65mm | 8 | 45 | 43 | 10 | 13 | 15 | Option 1 | C1 & C2 [1] | 100 |
| **TBU08075** | **TBU08075SS** | 8 x 75mm | 8 | 45 | 43 | 20 | 13 | 15 | Option 1 | C1 & C2 [1] | 100 |
| **TBU08095** | **TBU08095SS** | 8 x 95mm | 8 | 45 | 43 | 40 | 13 | 15 | Option 1 | C1 & C2 [1] | 100 |
| **TBU08115** | **TBU08115SS** | 8 x 115mm | 8 | 45 | 43 | 60 | 13 | 15 | Option 1 | C1 & C2 [1] | 100 |
| **TBU10075** | **TBU10075SS** | 10 x 75mm | 10 | 51 | 49 | 15 | 17 | 40 | Option 1 | C1 & C2 | 50 |
| **TBU10095** | **TBU10095SS** | 10 x 95mm | 10 | 51 | 49 | 35 | 17 | 40 | Option 1 | C1 & C2 | 50 |
| **TBU10100** | **TBU10100SS** | 10 x 100mm | 10 | 51 | 49 | 40 | 17 | 40 | Option 1 | C1 & C2 | 50 |
| **TBU10110** | **TBU10110SS** | 10 x 110mm | 10 | 51 | 49 | 50 | 17 | 40 | Option 1 | C1 & C2 | 50 |
| **TBU10130** | **TBU10130SS** | 10 x 130mm | 10 | 51 | 49 | 70 | 17 | 40 | Option 1 | C1 & C2 | 50 |
| **TBU12085** | **TBU12085SS** | 12 x 85mm | 12 | 63 | 60 | 10 | 19 | 60 / 55 | Option 1 | C1 & C2 | 25 |
| **TBU12105** | **TBU12105SS** | 12 x 105mm | 12 | 63 | 60 | 30 | 19 | 60 / 55 | Option 1 | C1 & C2 | 25 |
| **TBU12110** | **TBU12110SS** | 12 x 110mm | 12 | 63 | 60 | 35 | 19 | 60 / 55 | Option 1 | C1 & C2 | 25 |
| **TBU12125** | **TBU12125SS** | 12 x 125mm | 12 | 63 | 60 | 50 | 19 | 60 / 55 | Option 1 | C1 & C2 | 25 |
| **TBU12145** | **TBU12145SS** | 12 x 145mm | 12 | 63 | 60 | 70 | 19 | 60 / 55 | Option 1 | C1 & C2 | 25 |
| **TBU12160** | **TBU12160SS** | 12 x 160mm | 12 | 63 | 60 | 85 | 19 | 60 / 55 | Option 1 | C1 & C2 | 25 |
| **TBU16115** | **TBU16115SS** | 16 x 115mm | 16 | 82 | 79 | 15 | 24 | 110 / 100 | Option 1 | C1 & C2 | 20 |
| **TBU16135** | **TBU16135SS** | 16 x 135mm | 16 | 82 | 79 | 35 | 24 | 110 / 100 | Option 1 | C1 & C2 | 20 |
| **TBU16145** | **TBU16145SS** | 16 x 145mm | 16 | 82 | 79 | 45 | 24 | 110 / 100 | Option 1 | C1 & C2 | 20 |
| | **TBU16170SS** | 16 x 170mm | 16 | 82 | 79 | 70 | 24 | 110 / 100 | Option 1 | C1 & C2 | 20 |
| **TBU20165** | **TBU20165SS** | 20 x 165mm | 20 | 107 | 104 | 40 | 30 | 160 / 200 | Option 1 | C1 & C2 | 10 |
| **TBU20195** | **TBU20195SS** | 20 x 195mm | 20 | 107 (121)[2] | 104 | 70 | 30 | 160 / 200 | Option 1 | C1 & C2 | 10 |

[1] Seismic C1 and C2 for anchorage depth $h_{nom}$ ≥ 48mm

[2] Increased dimension for hammer drilling without borehole cleaning

  

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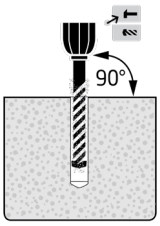
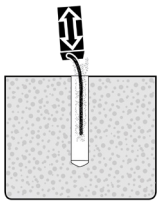
## INSTALLATION




**1. HOLE DRILLING WITH CLEANING**

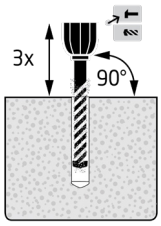
Hammer drilling or vacuum drilling: Drill hole perpendicular to concrete surface. If using a vacuum drill bit, proceed with step 3.



**2. HOLE CLEANING**

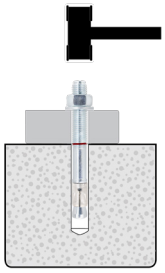
Blow out all dust from the hole. Alternatively, use a vacuum to clean to the bottom of the hole.

**OR**



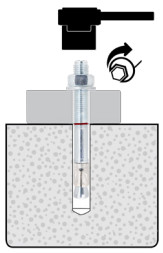

**1. HOLE DRILLING WITHOUT CLEANING (M20)**

When the specified drill hole depth is is reached, move the drill back and forth at least three times with the machine switched on to remove the dust in the drill hole (venting the drill hole). Continue with step 3.



**3. INSERT FASTENER**

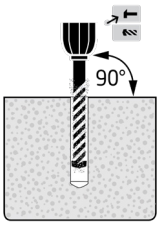
Drive in fastener to correct embedment depth (Refer to installation data table).



**4. APPLY TORQUE**

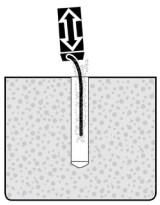
Apply correct installation torque $T_{inst.}$ (Refer to installation data table).

## FASTENER WITH FILLING OF ANNULAR GAP




**1. HOLE DRILLING WITH CLEANING**

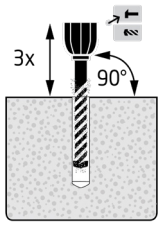
Hammer drilling or vacuum drilling: Drill hole perpendicular to concrete surface. If using a vacuum drill bit, proceed with step 3.



**2. HOLE CLEANING**

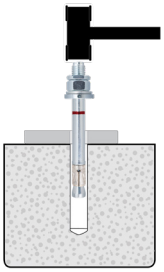
Blow out all dust from the hole. Alternatively, use a vacuum to clean to the bottom of the hole.

**OR**



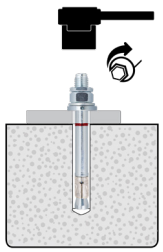

**1. HOLE DRILLING WITHOUT CLEANING (M20)**

When the specified drill hole depth is is reached, move the drill back and forth at least three times with the machine switched on to remove the dust in the drill hole (venting the drill hole). Continue with step 3.



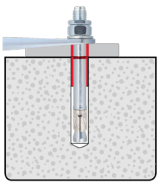
**3. INSERT FASTENER WITH FILLING OF ANNULAR GAP**

Drive in fastener to correct embedment depth (Refer to installation data table) with additionally mounted filling washer.



**4. APPLY TORQUE**

Apply correct installation torque $T_{inst.}$ (Refer to installation data table).



**5. FILL ANNULAR GAP WITH ADHESIVE**

Fill in the annular gap between anchor and fixture with injection adhesive (see Annex B1) Use enclosed reducing adapter. The annular gap is completely filled, when excess mortar seeps out

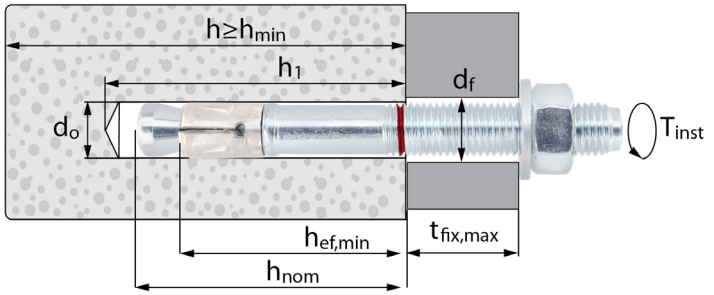
  

## INSTALLATION DATA

### THRU-BOLT™ ULTRA

☐ ZINC CLEAR

■ 316 STAINLESS STEEL (A4)




$d_o$: Nominal diameter of drill bit
$d_f$: Fixture clearance hole diameter
$h_{ef}$: Effective anchorage depth
$h_1$: Depth of drilled hole
$h_{nom}$: Overall fastener embedment depth in the concrete
$h_{min}$: Minimum thickness of concrete member
$t_{fix}$: Fixture thickness
$t_{inst}$: Installation torque

| Zinc Clear Part No. | A4 316 Stainless Steel Part No. | Description | Drill Diameter (mm) | Fixture Clearance hole (mm) | Installation Torque Zinc / A4 $T_{inst}$ (Nm) | Min. Anchor Embedment $h_{nom}$ (mm) | Std. Anchor Embedment $h_{nom}$ (mm) | Max. Anchor Embedment $h_{nom}$ (mm) | Anchor Effective Embedment $h_{ef}$ | Calculated Fixture Thickness $t_{fix}$ (mm) | Calculated Drill Depth (mm) | Head/Socket Size (mm) | Thread (mm) | Min. Edge Distance[2] $c_{min}$ | Min. Anchor Spacing[3] $s_{min}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TBU08065** | **TBU08065SS** | 8 x 65mm | 8 | 9 | 15 | 43[1] | - | 52 | $h_{nom}$ - 8 | 53 -$h_{nom}$ | $h_{nom}$ +2 | 13 | M8 x 23 | 40 | 35 |
| **TBU08075** | **TBU08075SS** | 8 x 75mm | 8 | 9 | 15 | 43[1] | 53 | 62 | $h_{nom}$ - 8 | 63 -$h_{nom}$ | $h_{nom}$ +2 | 13 | M8 x 33 | 40 | 35 |
| **TBU08095** | **TBU08095SS** | 8 x 95mm | 8 | 9 | 15 | 43[1] | 53 | 82 | $h_{nom}$ - 8 | 83 -$h_{nom}$ | $h_{nom}$ +2 | 13 | M8 x 53 | 40 | 35 |
| **TBU08115** | **TBU08115SS** | 8 x 115mm | 8 | 9 | 15 | 43[1] | 53 | 98 | $h_{nom}$ - 8 | 103 -$h_{nom}$ | $h_{nom}$ +2 | 13 | M8 x 73 | 40 | 35 |
| **TBU10075** | **TBU10075SS** | 10 x 75mm | 10 | 12 | 40 | 49 | - | 63 | $h_{nom}$ - 9 | 64 - $h_{nom}$ | $h_{nom}$ +2 | 17 | M10 x 30 | 45 | 40 |
| **TBU10095** | **TBU10095SS** | 10 x 95mm | 10 | 12 | 40 | 49 | 69 | 83 | $h_{nom}$ - 9 | 84 -$h_{nom}$ | $h_{nom}$ +2 | 17 | M10 x 50 | 45 | 40 |
| **TBU10100** | **TBU10100SS** | 10 x 100mm | 10 | 12 | 40 | 49 | 69 | 88 | $h_{nom}$ - 9 | 89 -$h_{nom}$ | $h_{nom}$ +2 | 17 | M10 x 55 | 45 | 40 |
| **TBU10110** | **TBU10110SS** | 10 x 110mm | 10 | 12 | 40 | 49 | 69 | 98 | $h_{nom}$ - 9 | 99 -$h_{nom}$ | $h_{nom}$ +2 | 17 | M10 x 65 | 45 | 40 |
| **TBU10130** | **TBU10130SS** | 10 x 130mm | 10 | 12 | 40 | 49 | 69 | 109 | $h_{nom}$ - 9 | 119 -$h_{nom}$ | $h_{nom}$ +2 | 17 | M10 x 85 | 45 | 40 |
| **TBU12085** | **TBU12085SS** | 12 x 85mm | 12 | 14 | 60 / 55 | 60 | - | 69 | $h_{nom}$ - 10 | 70 - $h_{nom}$ | $h_{nom}$ +3 | 19 | M12 x 29 | 55 | 50 |
| **TBU12105** | **TBU12105SS** | 12 x 105mm | 12 | 14 | 60 / 55 | 60 | 80 | 89 | $h_{nom}$ - 10 | 90 -$h_{nom}$ | $h_{nom}$ +3 | 19 | M12 x 49 | 55 | 50 |
| **TBU12110** | **TBU12110SS** | 12 x 110mm | 12 | 14 | 60 / 55 | 60 | 80 | 94 | $h_{nom}$ - 10 | 95 -$h_{nom}$ | $h_{nom}$ +3 | 19 | M12 x 54 | 55 | 50 |
| **TBU12125** | **TBU12125SS** | 12 x 125mm | 12 | 14 | 60 / 55 | 60 | 80 | 109 | $h_{nom}$ - 10 | 110 -$h_{nom}$ | $h_{nom}$ +3 | 19 | M12 x 69 | 55 | 50 |
| **TBU12145** | **TBU12145SS** | 12 x 145mm | 12 | 14 | 60 / 55 | 60 | 80 | 129 | $h_{nom}$ - 10 | 130 -$h_{nom}$ | $h_{nom}$ +3 | 19 | M12 x 89 | 55 | 50 |
| **TBU12160** | **TBU12160SS** | 12 x 160mm | 12 | 14 | 60 / 55 | 60 | 80 | 135 | $h_{nom}$ - 10 | 145 -$h_{nom}$ | $h_{nom}$ +3 | 19 | M12 x 104 | 55 | 50 |
| **TBU16115** | **TBU16115SS** | 16 x 115mm | 16 | 18 | 110 / 100 | 79 | - | 93 | $h_{nom}$ - 14 | 94 - $h_{nom}$ | $h_{nom}$ +3 | 24 | M16 x 39 | 65 | 65 |
| **TBU16135** | **TBU16135SS** | 16 x 135mm | 16 | 18 | 110 / 100 | 79 | 99 | 113 | $h_{nom}$ - 14 | 114 -$h_{nom}$ | $h_{nom}$ +3 | 24 | M16 x 59 | 65 | 65 |
| **TBU16145** | **TBU16145SS** | 16 x 145mm | 16 | 18 | 110 / 100 | 79 | 99 | 123 | $h_{nom}$ - 14 | 124 -$h_{nom}$ | $h_{nom}$ +3 | 24 | M16 x 69 | 65 | 65 |
| | **TBU16170SS** | 16 x 170mm | 16 | 18 | 110 / 100 | 79 | 99 | 123 | $h_{nom}$ - 14 | 149 -$h_{nom}$ | $h_{nom}$ +3 | 24 | M16 x 94 | 65 | 65 |
| **TBU20165** | **TBU20165SS** | 20 x 165mm | 20 | 22 | 160 / 200 | 104 | 114 | 154 | $h_{nom}$ - 14 | 174 -$h_{nom}$ | $h_{nom}$ +3 ($h_{nom}$ + 17)[4] | 30 | M20 x 69 | 90 | 95 |
| **TBU20195** | **TBU20195SS** | 20 x 195mm | 20 | 22 | 160 / 200 | 104 | 114 | 154 | $h_{nom}$ - 14 | 174 -$h_{nom}$ | $h_{nom}$ +3 ($h_{nom}$ + 17)[4] | 30 | M20 x 96 | 90 | 95 |

[1] Seismic C1 and C2 for anchorage depth hnom ≥ 48mm
[2] Minimum Edge Distance published, for multiple anchor configurations refer to ICCONS DesignPRO to ensure this distance can be met with application anchor spacings
[3] Minimum Anchor Spacing published, refer to ICCONS DesignPRO to check minimum anchor spacing for a given edge distance
[4] Increased dimension for hammer drilling without borehole cleaning

# LOADS AND PERFORMANCE DATA

## THRU-BOLT™ ULTRA

316 STAINLESS STEEL (A4)

| | | | Unit | M8 | M8 | M8 | M10 | M10 | M10 | M12 | M12 | M12 | M16 | M16 | M16 | M20 | M20 | M20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum anchorage depth[1] | | $h_{ef,min}$ | mm | 35 | | | 40 | | | 50 | | | 65 | | | 90 | | |
| Standard anchorage depth | | $h_{ef,std}$ | mm | | 45 | | | 60 | | | 70 | | | 85 | | | 100 | |
| Maximum anchorage depth | | $h_{ef,max}$ | mm | | | 90 | | | 100 | | | 125 | | | 160 | | | 140 |
| CRACKED CONCRETE | | | | | | | | | | | | | | | | | | |
| Mean ultimate loads, tension | C20/25 | $N_{Ru,m}$ | kN | 10.1 | 12.3 | - | 15.6 | 22.6 | - | 17.9 | 27.0 | - | 30.8 | 45.9 | - | 50.7 | 61.1 | - |
| Mean ultimate loads, shear | C20/25 | $V_{Ru,m}$ | kN | 17.4 | 17.4 | - | 28.4 | 28.4 | - | 40.7 | 40.7 | - | 67.2 | 67.2 | - | 86.3 | 86.3 | - |
| Approved loads, tension | C20/25 | (appr. N) | kN | 3.4 | 4.5 | 4.5 | 4.1 | 7.1 | 7.1 | 5.8 | 9.6 | 10.5 | 8.6 | 12.9 | 14.3 | 14.0 | 16.4 | 21.4 |
| | C25/30 | (appr. N) | kN | 3.8 | 5.0 | 5.0 | 4.6 | 7.6 | 7.6 | 6.5 | 10.7 | 11.7 | 9.6 | 14.4 | 15.4 | 15.7 | 18.3 | 23.1 |
| | C30/37 | (appr. N) | kN | 4.2 | 5.4 | 5.4 | 5.1 | 8.0 | 8.0 | 7.1 | 11.8 | 12.8 | 10.5 | 15.7 | 16.4 | 17.1 | 20.1 | 24.6 |
| | C40/50 | (appr. N) | kN | 4.8 | 6.1 | 6.1 | 5.9 | 8.6 | 8.6 | 8.2 | 13.6 | 14.8 | 12.2 | 18.1 | 18.1 | 19.8 | 23.2 | 27.1 |
| | C50/60 | (appr. N) | kN | 5.4 | 6.8 | 6.8 | 6.6 | 9.1 | 9.1 | 9.2 | 15.2 | 16.6 | 13.6 | 19.5 | 19.5 | 22.1 | 25.9 | 29.2 |
| UNCRACKED CONCRETE | | | | | | | | | | | | | | | | | | |
| Approved loads, tension[1)] | C20/25 | (appr. N) | kN | 4.9 | 6.7 | 6.7 | 5.9 | 10.9 | 11.4 | 8.3 | 13.7 | 14.3 | 12.3 | 18.4 | 23.8 | 20.0 | 23.4 | 26.2 |
| | C25/30 | (appr. N) | kN | 5.4 | 7.4 | 7.4 | 6.6 | 12.2 | 12.6 | 9.3 | 15.3 | 16.0 | 13.7 | 20.5 | 24.9 | 22.4 | 26.2 | 29.3 |
| | C30/37 | (appr. N) | kN | 5.9 | 8.1 | 8.1 | 7.3 | 13.3 | 13.7 | 10.1 | 16.8 | 17.5 | 15.0 | 22.5 | 25.9 | 24.5 | 28.7 | 32.1 |
| | C40/50 | (appr. N) | kN | 6.9 | 9.4 | 9.4 | 8.4 | 14.5 | 14.5 | 11.7 | 19.4 | 20.2 | 17.4 | 26.0 | 27.4 | 28.3 | 33.1 | 37.0 |
| | C50/60 | (appr. N) | kN | 7.7 | 9.4 | 9.4 | 9.4 | 14.5 | 14.5 | 13.1 | 21.4 | 21.4 | 19.4 | 28.7 | 28.7 | 31.6 | 37.0 | 41.4 |
| CRACKED CONCRETE | | | | | | | | | | | | | | | | | | |
| Approved loads, shear | C20/25 | (appr. V) | kN | 9.0 | 9.0 | 9.0 | 12.9 | 15.3 | 15.3 | 17.4 | 21.9 | 21.9 | 30.9 | 34.3 | 34.3 | 46.2 | 47.9 | 47.9 |
| Approved loads, shear | ≥ C25/30 | (appr. V) | kN | 9.0 | 9.0 | 9.0 | 14.4 | 15.3 | 15.3 | 19.4 | 21.9 | 21.9 | 34.3 | 34.3 | 34.3 | 47.9 | 47.9 | 47.9 |
| UNCRACKED CONCRETE | | | | | | | | | | | | | | | | | | |
| Approved loads, shear | C20/25 | (appr. V) | kN | 9.0 | 9.0 | 9.0 | 15.3 | 15.3 | 15.3 | 21.9 | 21.9 | 21.9 | 34.3 | 34.3 | 34.3 | 47.9 | 47.9 | 47.9 |
| Approved loads, shear | ≥ C25/30 | (appr. V) | kN | 9.0 | 9.0 | 9.0 | 15.3 | 15.3 | 15.3 | 21.9 | 21.9 | 21.9 | 34.3 | 34.3 | 34.3 | 47.9 | 47.9 | 47.9 |
| Approved bending moments | | (appr. M) | Nm | 17.1 | 17.1 | 17.1 | 34.3 | 34.3 | 34.3 | 60.0 | 60.0 | 60.0 | 137.1 | 137.1 | 137.1 | 235.4 | 235.4 | 235.4 |
| **Spacing and edge distance[2)]** | | | | | | | | | | | | | | | | | | |
| Effective anchorage depth | | $h_{ef}$ | mm | 35 | 45 | 90 | 40 | 60 | 100 | 50 | 70 | 125 | 65 | 85 | 160 | 90 | 100 | 140 |
| Minimum thickness of concrete slab | | $h_{min}$ | mm | 80 | 80 | 135 | 80 | 90 | 150 | 100 | 105 | 187.5 | 120 | 127.5 | 240 | 150 | 150 | 210 |
| Minimum spacing | | $s_{min}$ | mm | 35 | 35 | 35 | 40 | 40 | 40 | 50 | 50 | 50 | 65 | 65 | 65 | 95 | 95 | 95 |
| Minimum edge distance | | $c_{min}$ | mm | 40 | 40 | 40 | 45 | 45 | 45 | 55 | 55 | 55 | 65 | 65 | 65 | 90 | 90 | 90 |

[1)] Seismic C1 and C2 for anchorage depth hnom ≥ 48mmv

[2)] Minimum Edge Distance published, for multiple anchor configurations refer to ICCONS DesignPRO to ensure this distance can be met with application anchor spacings

# LOADS AND PERFORMANCE DATA

## THRU-BOLT™ ULTRA

☐ ZINC CLEAR

| | | | Unit | M8 | M8 | M8 | M10 | M10 | M10 | M12 | M12 | M12 | M16 | M16 | M16 | M20 | M20 | M20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum anchorage depth[1] | | $h_{ef,min}$ | mm | 35 | | | 40 | | | 50 | | | 65 | | | 90 | | |
| Standard anchorage depth | | $h_{ef,std}$ | mm | | 45 | | | 60 | | | 70 | | | 85 | | | 100 | |
| Maximum anchorage depth | | $h_{ef,max}$ | mm | | | 90 | | | 100 | | | 125 | | | 160 | | | 140 |
| CRACKED CONCRETE | | | | | | | | | | | | | | | | | | |
| Mean ultimate loads, tension | C20/25 | $N_{Ru,m}$ | kN | 10.3 | 13.9 | - | 12.6 | 23.3 | - | 20.0 | 30.3 | - | 31.2 | 46.0 | - | 50.7 | 60.1 | - |
| Mean ultimate loads, shear | C20/25 | $V_{Ru,m}$ | kN | 18.2 | 18.2 | - | 30.5 | 30.5 | - | 43.6 | 43.6 | - | 73.3 | 73.3 | - | 118.6 | 116.6 | - |
| Approved loads, tension | C20/25 | (appr. N) | kN | 3.4 | 4.5 | 4.5 | 4.1 | 7.6 | 8.1 | 5.8 | 9.6 | 10.5 | 8.6 | 12.9 | 16.7 | 14.0 | 16.4 | 21.4 |
| | C25/30 | (appr. N) | kN | 3.8 | 5.0 | 5.0 | 4.6 | 8.5 | 9.1 | 6.5 | 10.7 | 11.5 | 9.6 | 14.4 | 18.0 | 15.7 | 18.3 | 23.1 |
| | C30/37 | (appr. N) | kN | 4.2 | 5.5 | 5.5 | 5.1 | 9.3 | 9.9 | 7.1 | 11.8 | 12.5 | 10.5 | 15.7 | 19.2 | 17.1 | 20.1 | 24.6 |
| | C40/50 | (appr. N) | kN | 4.8 | 6.3 | 6.3 | 5.9 | 10.8 | 11.4 | 8.2 | 13.6 | 14.2 | 12.2 | 18.2 | 21.2 | 19.8 | 23.2 | 27.1 |
| | C50/60 | (appr. N) | kN | 5.4 | 7.1 | 7.1 | 6.6 | 12.0 | 12.8 | 9.2 | 15.2 | 15.6 | 13.6 | 20.3 | 23.0 | 22.1 | 25.9 | 29.2 |
| UNCRACKED CONCRETE | | | | | | | | | | | | | | | | | | |
| Approved loads, tension[1] | C20/25 | (appr. N) | kN | 4.9 | 7.1 | 9.4 | 5.9 | 10.9 | 11.9 | 8.3 | 13.7 | 20.0 | 12.3 | 18.4 | 23.8 | 20.0 | 23.4 | 26.2 |
| | C25/30 | (appr. N) | kN | 5.4 | 7.9 | 9.4 | 6.6 | 12.2 | 12.9 | 9.3 | 15.3 | 21.0 | 13.7 | 20.5 | 24.9 | 22.4 | 26.2 | 29.3 |
| | C30/37 | (appr. N) | kN | 5.9 | 8.7 | 9.4 | 7.3 | 13.3 | 13.8 | 10.1 | 16.8 | 21.4 | 15.0 | 22.5 | 25.8 | 24.5 | 28.7 | 32.1 |
| | C40/50 | (appr. N) | kN | 6.9 | 9.4 | 9.4 | 8.4 | 14.5 | 14.5 | 11.7 | 19.4 | 21.4 | 17.4 | 26.0 | 27.3 | 28.3 | 33.1 | 37.0 |
| | C50/60 | (appr. N) | kN | 7.7 | 9.4 | 9.4 | 9.4 | 14.5 | 14.5 | 13.1 | 21.4 | 21.4 | 19.4 | 28.5 | 28.5 | 31.6 | 37.0 | 41.4 |
| CRACKED CONCRETE | | | | | | | | | | | | | | | | | | |
| Approved loads, shear | C20/25 | (appr. V) | kN | 9.2 | 9.6 | 9.6 | 11.6 | 15.9 | 15.9 | 19.1 | 22.7 | 22.7 | 29.2 | 39.7 | 39.7 | 46.2 | 54.1 | 62.0 |
| Approved loads, shear | ≥ C25/30 | (appr. V) | kN | 9.6 | 9.6 | 9.6 | 13.0 | 15.9 | 15.9 | 21.4 | 22.7 | 22.7 | 32.7 | 39.7 | 39.7 | 51.7 | 60.5 | 62.0 |
| UNCRACKED CONCRETE | | | | | | | | | | | | | | | | | | |
| Approved loads, shear | C20/25 | (appr. V) | kN | 9.6 | 9.6 | 9.6 | 15.9 | 15.9 | 15.9 | 22.7 | 22.7 | 22.7 | 39.7 | 39.7 | 39.7 | 62.0 | 62.0 | 62.0 |
| Approved loads, shear | ≥ C25/30 | (appr. V) | kN | 9.6 | 9.6 | 9.6 | 15.9 | 15.9 | 15.9 | 22.7 | 22.7 | 22.7 | 39.7 | 39.7 | 39.7 | 62.0 | 62.0 | 62.0 |
| | | | | | | | | | | | | | | | | | | |
| Approved bending moments | | (appr. M) | Nm | 15.4 | 15.4 | 15.4 | 31.4 | 31.4 | 31.4 | 56.6 | 56.6 | 56.6 | 127.4 | 127.4 | 127.4 | 222.9 | 222.9 | 222.9 |
| **Spacing and edge distance[2]** | | | | | | | | | | | | | | | | | | |
| Effective anchorage depth | | $h_{ef}$ | mm | 35 | 45 | 90 | 40 | 60 | 100 | 50 | 70 | 125 | 65 | 85 | 160 | 90 | 100 | 140 |
| Minimum thickness of concrete slab | | $h_{min}$ | mm | 80 | 80 | 135 | 80 | 90 | 150 | 100 | 105 | 187.5 | 120 | 127.5 | 240 | 150 | 150 | 210 |
| Minimum spacing | | $s_{min}$ | mm | 35 | 35 | 35 | 40 | 40 | 40 | 50 | 50 | 50 | 65 | 65 | 65 | 95 | 95 | 95 |
| Minimum edge distance | | $c_{min}$ | mm | 40 | 40 | 40 | 45 | 45 | 45 | 55 | 55 | 55 | 65 | 65 | 65 | 90 | 90 | 90 |

[1] Seismic C1 and C2 for anchorage depth hnom ≥ 48mm

[2] Minimum Edge Distance published, for multiple anchor configurations refer to ICCONS DesignPRO to ensure this distance can be met with application anchor spacings

ETA-25/0120

## FIRE SPECIFICATIONS

| Anchor system | Documents | Size | Maximum tension load in fire test for the fire resistance classes R 30 (30 min) | R 60 (60 min) | R 90 (90 min) | R 120 (120 min) |
|---|---|---|---|---|---|---|
| **THRU-BOLT™ ULTRA** | | M8 $h_{ef,min}$ | 1.20 | 1.00 | 0.70 | 0.60 |
| Steel, Zinc plated | | M8 $h_{ef,std}$ | 1.20 | 1.00 | 0.70 | 0.60 |
| | | M8 $h_{ef,max}$ | 1.20 | 1.00 | 0.70 | 0.60 |
| | | M10 $h_{ef,min}$ | 1.74 | 1.74 | 1.30 | 1.00 |
| | | M10 $h_{ef,std}$ | 2.60 | 1.90 | 1.30 | 1.00 |
| | | M10 $h_{ef,max}$ | 2.60 | 1.90 | 1.30 | 1.00 |
| | | M12 $h_{ef,min}$ | 3.04 | 3.04 | 2.10 | 1.50 |
| | ETA-25/0120 | M12 $h_{ef,std}$ | 4.60 | 3.30 | 2.10 | 1.50 |
| | | M12 $h_{ef,max}$ | 4.60 | 3.30 | 2.10 | 1.50 |
| | | M16 $h_{ef,min}$ | 5.86 | 5.60 | 3.50 | 2.50 |
| | | M16 $h_{ef,std}$ | 7.50 | 5.60 | 3.50 | 2.50 |
| | | M16 $h_{ef,max}$ | 7.50 | 5.60 | 3.50 | 2.50 |
| | | M20 $h_{ef,min}$ | 9.40 | 8.20 | 6.90 | 6.30 |
| | | M20 $h_{ef,std}$ | 9.40 | 8.20 | 6.90 | 6.30 |
| | | M20 $h_{ef,max}$ | 9.40 | 8.20 | 6.90 | 6.30 |
| **THRU-BOLT™ ULTRA A4** | | M8 $h_{ef,min}$ | 1.25 | 1.25 | 1.25 | 1.00 |
| Stainless Steel A4/316, Stainless Steel 1.4529 | | M8 $h_{ef,std}$ | 2.34 | 2.34 | 1.80 | 1.20 |
| | | M8 $h_{ef,max}$ | 2.38 | 2.38 | 1.80 | 1.20 |
| | | M10 $h_{ef,min}$ | 1.74 | 1.74 | 1.74 | 1.39 |
| | | M10 $h_{ef,std}$ | 4.25 | 4.25 | 3.10 | 2.10 |
| | | M10 $h_{ef,max}$ | 4.25 | 4.25 | 3.10 | 2.10 |
| | | M12 $h_{ef,min}$ | 3.04 | 3.04 | 3.04 | 2.43 |
| | ETA-25/0120 | M12 $h_{ef,std}$ | 5.50 | 5.50 | 4.90 | 3.40 |
| | | M12 $h_{ef,max}$ | 5.50 | 5.50 | 4.90 | 3.40 |
| | | M16 $h_{ef,min}$ | 5.86 | 5.86 | 5.86 | 4.69 |
| | | M16 $h_{ef,std}$ | 8.75 | 8.75 | 8.10 | 5.60 |
| | | M16 $h_{ef,max}$ | 8.75 | 8.75 | 8.10 | 5.60 |
| | | M20 $h_{ef,min}$ | 11.25 | 11.25 | 11.25 | 9.00 |
| | | M20 $h_{ef,std}$ | 11.25 | 11.25 | 11.25 | 9.00 |
| | | M20 $h_{ef,max}$ | 11.25 | 11.25 | 11.25 | 9.00 |

ETA-25/0120

## MATERIAL SPECIFICATIONS

| Part | ULTRA (Steel, zinc plated) | ULTRA A4 (Stainless steel CRC III) | ULTRA HCR* (High corrosion resistant steel CRC V) |
|---|---|---|---|
| Conical bolt | Steel, galvanized ≥ 5 µm, fracture elongation $A_5$ ≥ 8% | Stainless steel, fracture elongation $A_5$ ≥ 8% | High corrosion resistant steel, fracture elongation $A_5$ ≥ 8% |
| Expansion sleeve | Stainless steel | Stainless steel | Stainless steel |
| Washer | Steel, galvanized ≥ 5 µm | Stainless steel | High corrosion resistant steel |
| Filling washer CFW | | | |
| Hexagon nut | | | |
| Cap nut ASCN | | | |

*On request, Lead times may apply

## NUT WASHER DIMENSIONS

| Dimension | | | M8 | M10 | M12 | M16 | M20 |
|---|---|---|---|---|---|---|---|
| Width across nut | SW | mm | 13 | 17 | 19 | 24 | 30 |
| Height of hexagon nut | | mm | 6.5 | 8 | 10 | 13 | 16 |
| Outer diameter x Washer thickness | t | mm | 16 x 1.6 | 20 x 2 | 24 x 2.5 | 30 x 3 | 37 x 3 |

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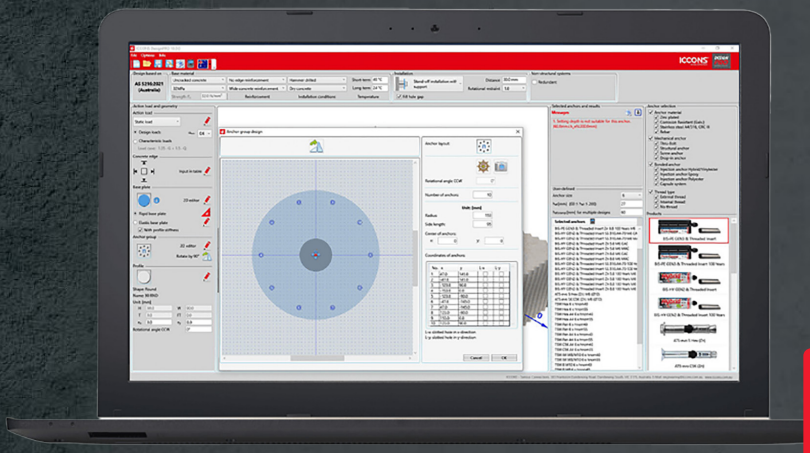

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