INDO CONSTRUCTION FASTENING SYSTEMS

A brand of Indo Spark Group Since 1978

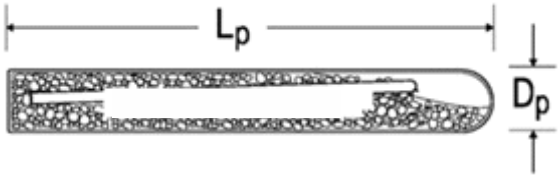
# SUPERCAP

## Technical Datasheet

for galvanised or stainless steel bonded anchor

## Product and installed condition

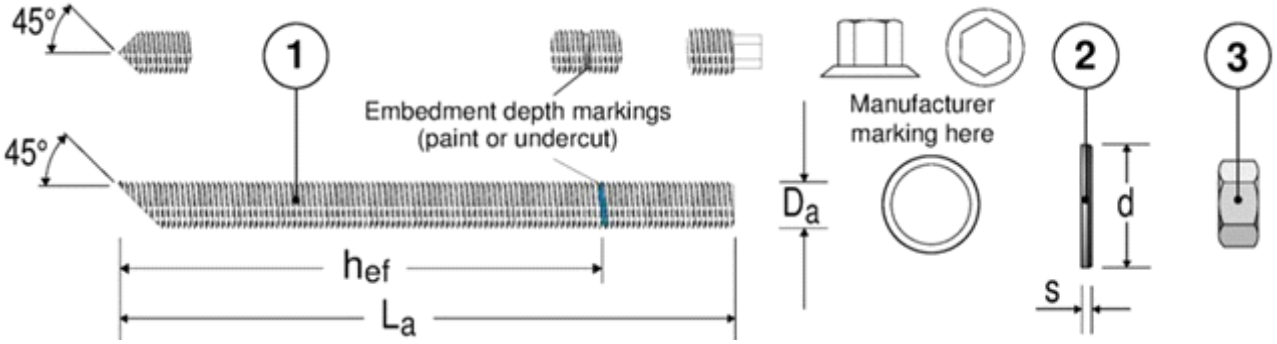
**Mortar Capsule SuperCap :**




**Marking capsule**

| | |
|---|---|
| Manufacturer : | ICFS |
| Capsule Type : | SuperCap |
| Capsule Size : | M.. |

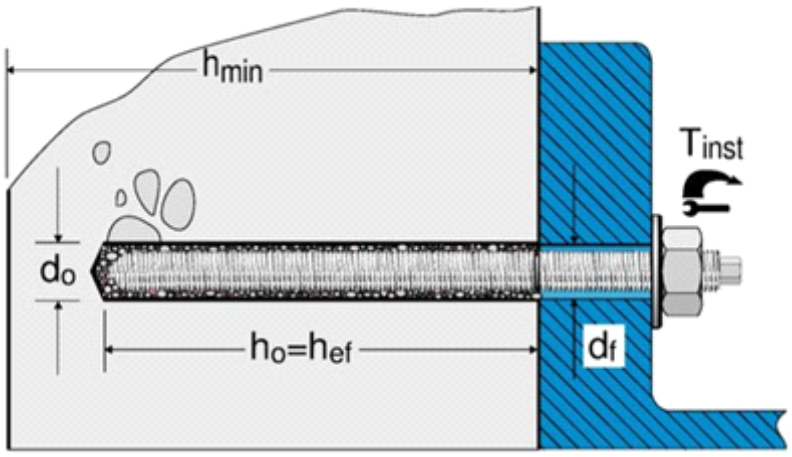
**Anchor Rod**




**z.B.B16A**

**Marking anchor rod**

| **Manufacturer** | **B** | | |
|---|---|---|---|
| **Size** | **8, 10, 12, 16, 20, 24** | | |
| **Material** | | | |
| Galvanised property class 5.8 | A | Stainless steel 1.4401, property class 70 | C |
| Galvanised property class 8.8 | B | Stainless steel 1.4404, property class 70 | K |
| Hot dipped galvanised property class 5.8 | H | Stainless steel 1.4529, property class 70 | E |
| Hot dipped galvanised property class 8.8 | I | Stainless steel 1.4565, property class 70 | R |
| | | Stainless steel 1.4571, property class 70 | D |
| | | Stainless steel 1.4401, property class 80 | M |
| | | Stainless steel 1.4404, property class 80 | P |
| | | Stainless steel 1.4571, property class 80 | O |



## Table A1: Materials

| Part | Description | Material | | | |
|---|---|---|---|---|---|
| 1 | **Threaded rod** | Carbon steel property class 5.8 or 8.8 EN ISO 898-1:2013 | | Stainless steel 1.4401, 1.4404 or 1.4571 property class A4-70 or A4-80 EN ISO 3506-1:2009 $A_5$> 8% fracture elongation | High Corrosion resistant steel 1.4529 or 1.4565 property class 70 EN ISO 3506-1:2009 $A_5$> 8% fracture elongation |
| | | Galvanised steel ≥5µm acc. to EN ISO 4042:1999 $A_5$> 8% fracture elongation | Hot dip galvanised steel EN ISO 10684:2004+AC:2009 $A_5$> 8% fracture elongation | | |
| 2 | **Washer** | Carbon steel | | Stainless steel 1.4401, 1.4404 or 1.4571 | High Corrosion resistant steel 1.4529 or 1.4565 |
| | | Galvanised steel ≥5µm acc. to EN ISO 4042:1999 | Hot dip galvanised steel 10684:2004+AC:2009 | | |
| | | EN ISO 887:2006 oder EN ISO 7089:2000 bis EN ISO 7094:2000 | | | |
| 3 | **Hexagon nut** | Carbon steel property class 5 to 8 EN ISO 898-2:2012 | | Stainless steel 1.4401, 1.4404 or 1.4571 property class A4-70 or A4 -80 EN ISO 3506-2:2009 | High Corrosion resistant steel 1.4529 or 1.4565 property class 70 EN ISO 3506-2:2009 |
| | | Galvanised steel ≥5µm acc. to EN ISO 4042:1999 | Hot dip galvanised steel 10684:2004+AC:2009 | | |
| | | EN ISO 4032:2012 oder EN ISO 4034:2012 | | | |
| 4 | **Glass capsule** | Glass<br>Quartz<br>Resin<br>Hardener | | | |

## Table A2: Dimensions

| Part | Description | | | M8 | M10 | M12 | M16 | M20 | M24 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | **Threaded rod** | $D_a$ | [mm] | M8 | M10 | M12 | M16 | M2 | M24 |
| | | $L_a$ ≥ | | 95 | 100 | 120 | 140 | 190 | 235 |
| 2 | **Washer** | s | [mm] | 1,6 | 2,1 | 2,5 | 3,0 | 3,0 | 4,0 |
| | | d | | 16 | 21 | 24 | 30 | 37 | 44 |
| 3 | **Hexagon nut** | SW | [mm] | 13 | 17 | 19 | 24 | 30 | 36 |
| 4 | **Glass capsule** | $D_p$ | [mm] | 9 | 11 | 13 | 17 | 22 | 24 |
| | | $L_p$ | | 80 | 80 | 95 | 95 | 175 | 210 |

## Specifications of intended use

**Anchorages subject to:**

- Static and quasi-static loads: all sizes.

**Base materlals**

- Reinforced or unreinforced normal weight concrete without fibers according to EN 206:2013.
- Strength classes C20/25 to C50/60 according to EN 206-1 :2013.
- Non-cracked concrete.

**Temperature Range:**

- I: - 40 °C to +40 °C (max long term temperature +24 °C and max short term temperature +40 °C)
- II: - 40°C to +80°C (max long term temperature +50 °C and max short term temperature +80 °C)

**Use conditions (Environmental conditions):**

- Structures subject to dry internal conditions
  (zinc coated steel, stainless steel or high corrosion resistant steel).
- Structures subject to external atmospheric exposure (including industrial and marine environment) and to permanently damp internal condition, if no particular aggressive conditions exist
  (stainless steel or high corrosion resistant steel).
- Structures subject to external atmospheric exposure and to permanently damp internal condition, if other particular aggressive conditions exist
  (high corrosion resistant steel).
  **Note:** Particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater , chloride atmosphere of indoor swimming pools or atmosphere with extreme chemical pollution(e.g. in desulphurization plants or road tunnels where de-icing materials are used).

**Design:**

- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings (e. g. position of the anchor relative to reinforcement or to supports , etc.).
- Anchorages are designed in accordance with FprEN 1992-4:2016 and TR 055 .

**Installation:**

- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Dry or wet concrete: all sizes.
- Hole drilling by hammer drilling.
- cleaning the drill hole:
  removing possibly existing water in the drill hole completely and cleaning the drill hole by at least one blowing operation , by at least 1 x brushing I 1 x blowing I 1 x brushing operation by using the steel brush supplied by the manufacturer ; before brushing cleaning the brush and checking whether the brush diameter according to Annex B 2, Table 83 is still sufficient. The steel brush shall produce natural resistance as It enters the anchor hole. If this is not the case a new brush or a brush with a larger diameter must be used.

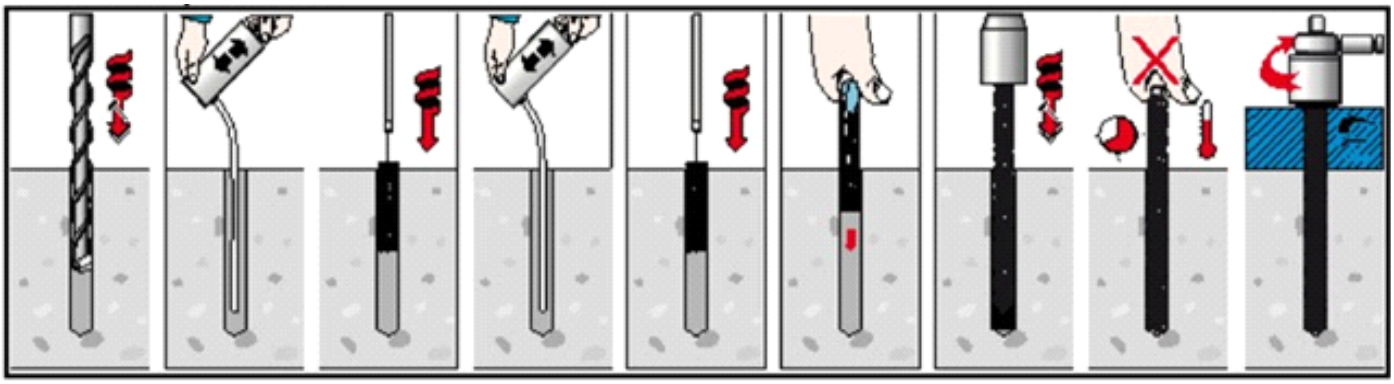
## Table B3 Installation parameters

| Anchor size | | | M8 | M10 | M12 | M16 | M20 | M24 |
|---|---|---|---|---|---|---|---|---|
| Nominal drill hole diameter | $d_0$ | [mm] | 10 | 12 | 14 | 18 | 25 | 28 |
| Cutting diameter | $d_{cut}\leq$ | [mm] | 10,5 | 12,5 | 14,5 | 18,5 | 25,5 | 28,5 |
| Depth of drill hole | $h_0$ | [mm] | 80 | 90 | 110 | 125 | 170 | 210 |
| Effective anchorage depth | $h_{ef}$ | [mm] | 80 | 90 | 110 | 125 | 170 | 210 |
| Diameter of clearance hole in the fixture | $d_f$ | [mm] | 9 | 12 | 14 | 18 | 22 | 26 |
| Diameter of steel brush | D | [mm] | 11 | 13 | 16 | 20 | 27 | 30 |
| Maximum torque moment | $T_{inst}$ | [mm] | 10 | 20 | 40 | 80 | 120 | 180 |

**Steel brush**

**ICFS brush, extension and SDS+ connection**


**Installation procedure**



## Table B2

**Minimum member thickness, edge distance and spacing**

| Anchor size | | | M8 | M10 | M12 | M16 | M20 | M24 |
|---|---|---|---|---|---|---|---|---|
| Minimum member thickness | $h_{min}$ | [mm] | 110 | 120 | 140 | 160 | 220 | 260 |
| Minimum edge distance | $C_{min}$ | [mm] | 40 | 45 | 55 | 65 | 85 | 105 |
| Minimum spacing | $S_{min}$ | [mm] | 40 | 45 | 55 | 65 | 85 | 105 |

## Table B3 Minimum curing time

| Temperature in the concrete member | Minimum curing time in dry concrete | Minimum curing time in wet concrete |
|---|---|---|
| ≥ 0°C | 5hrs. | 10hrs. |
| ≥ + 5°C | 1hr. | 2hrs. |
| ≥ +20°C | 20min. | 40min. |
| ≥ +30°C | 10min. | 20min. |

## Table C1 Metal parts made of zinc plated or hot dip galvanised steel

| Design method A, characteristic values tor tension loads | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Anchor Sizes** | | **M8** | **M10** | **M12** | **M16** | **M20** | **M24** |
| **Steel failure** | | | | | | | |
| Characteristic resistance **property class 5.8** | $N_{Rk,s}$ [kN] | 18 | 29 | 42 | 78 | 123 | 177 |
| Characteristic resistance **property class 8 .8** | $N_{Rk,s}$ [kN] | 29 | 46 | 67 | 126 | 196 | 282 |
| **Combined pull-out and concrete failure** | | | | | | | |
| Characteristic resistance in non-cracked concrete C20/25 to C50/60 | | | | | | | |
| Temperature range I | $N^0_{Rk,p}$ [kN] | 20 | 30 | 40 | 60 | 90 | 120 |
| Temperature range II | $N^0_{Rk,p}$ [kN] | 20 | 30 | 40 | 50 | 75 | 90 |
| Factor for $k_1$ | $k_{ucr,N}$ [-] | 11,0 | | | | | |
| **Concrete cone failure** | | | | | | | |
| Factor for $k_1$ | $k_{ucr,N}$ [-] | 11,0 | | | | | |
| Characteristic edge distance | $C_{cr,N}$ [mm] | 1,5 $h_{ef}$ | | | | | |
| Characteristic spacing | $S_{cr,N}$ [mm] | 3 $h_{ef}$ | | | | | |
| **Splitting**[1)] | | | | | | | |
| Edge distance | $C_{cr,sp}$ [mm] | 1,5 $h_{ef}$ | 1 $h_{ef}$ | | | | |
| Spacing | $S_{cr,sp}$ [mm] | 3 $h_{ef}$ | 2 $h_{ef}$ | | | | |
| Installation factor | $\gamma_{inst}$ [-] | 1,2 | | | | | |

[1)] For the proof against splitting failure $N^0_{Rk.c}$ has to be replaced by $N^0_{Rk.p}$.

## Table C2 Displacements under tension loads

| Anchor Sizes | | | M8 | M10 | M12 | M16 | M20 | M24 |
|---|---|---|---|---|---|---|---|---|
| Tension load | N | [kN] | 8 | 12 | 16 | 20 | 30 | 38 |
| Displacement | $\delta_{N0}$ | [mm] | 0,1 | 0,2 | 0,2 | 0,2 | 0,5 | 0,4 |
| | $\delta_{N\infty}$ | [mm] | 0,5 | | | | | |

**Table C3** **Metal parts made of stainless steel 1.4401, 1.4404 or 1.4571**

| Design method A, characteristic values for tension loads | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Anchor Sizes** | | | **M8** | **M10** | **M12** | **M16** | **M20** | **M24** |
| **Steel failure** | | | | | | | | |
| Characteristic resistance **strength class A4- 70** | $N_{Rk,s}$ | [kN] | 26 | 40 | 59 | 110 | 172 | 247 |
| Characteristic resistance **strength class A4-80** | $N_{Rk,s}$ | [kN] | 29 | 46 | 67 | 126 | 196 | 282 |
| **Combined pull-out and concrete failure** | | | | | | | | |
| Characteristic resistance in non-cracked concrete C20/25 to C50/60 | | | | | | | | |
| Temperature range I | $N^0_{Rk,p}$ | [kN] | 20 | 30 | 40 | 60 | 90 | 120 |
| Temperature range II | $N^0_{Rk,p}$ | [kN] | 20 | 30 | 40 | 50 | 75 | 90 |
| Factor for $k_1$ | $k_{ucr,N}$ | [-] | 11,0 | | | | | |
| **Concrete cone failure** | | | | | | | | |
| Factor for $k_1$ | $k_{ucr,N}$ | [-] | 11,0 | | | | | |
| Characteristic edge distance | $C_{cr,N}$ | [mm] | 1,5 $h_{ef}$ | | | | | |
| Characteristic spacing | $S_{cr,N}$ | [mm] | 3 $h_{ef}$ | | | | | |
| **Splitting**[1)] | | | | | | | | |
| Edge distance | $C_{cr,sp}$ | [mm] | 1,5 $h_{ef}$ | 1 $h_{ef}$ | | | | |
| Spacing | $S_{cr,sp}$ | [mm] | 3 $h_{ef}$ | 2 $h_{ef}$ | | | | |
| Installation factor | $\gamma_{inst}$ | [-] | 1,2 | | | | | |

[1)]For the proof against splitting failure $N^0_{Rk,c}$ has to be replaced by $N^0_{Rk,p}$.

**Table C4** **Displacements under tension loads**

| **Anchor Sizes** | | | **M8** | **M10** | **M12** | **M16** | **M20** | **M24** |
|---|---|---|---|---|---|---|---|---|
| Tension load | N | [kN] | 8 | 12 | 16 | 20 | 30 | 38 |
| Displacement | $\delta_{N0}$ | [mm] | 0,1 | 0,2 | 0,2 | 0,2 | 0,5 | 0,4 |
| | $\delta_{N\infty}$ | [mm] | 0,5 | | | | | |

**Table C5** **Metal parts made of high corrosion resistant steel 1.4529 or 1.4565**

| Design method A, characteristic values for tension loads | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Anchor Sizes** | | | **M8** | **M10** | **M12** | **M16** | **M20** | **M24** |
| **Steel failure** | | | | | | | | |
| Characteristic resistance **strength class 70** | $N_{Rk,s}$ | [kN] | 26 | 40 | 59 | 110 | 172 | 247 |
| **Combined pull-out and concrete failure** | | | | | | | | |
| Characteristic resistance in non-cracked concrete C20/25 to C50/60 | | | | | | | | |
| Temperature range I | $N^0_{Rk,p}$ | [kN] | 20 | 30 | 40 | 60 | 90 | 120 |
| Temperature range II | $N^0_{Rk,p}$ | [kN] | 20 | 30 | 40 | 50 | 75 | 90 |
| Factor for $k_1$ | $k_{ucr,N}$ | [-] | 11,0 | | | | | |
| **Concrete cone failure** | | | | | | | | |
| Factor for $k_1$ | $k_{ucr,N}$ | [-] | 11,0 | | | | | |
| Characteristic edge distance | $C_{cr,N}$ | [mm] | 1,5 $h_{ef}$ | | | | | |
| Characteristic spacing | $S_{cr,N}$ | [mm] | 3 $h_{ef}$ | | | | | |
| **Splitting**[1)] | | | | | | | | |
| Edge distance | $C_{cr,sp}$ | [mm] | 1,5 $h_{ef}$ | 1 $h_{ef}$ | | | | |
| Spacing | $S_{cr,sp}$ | [mm] | 3 $h_{ef}$ | 2 $h_{ef}$ | | | | |
| Installation factor | $\gamma_{inst}$ | [-] | 1,2 | | | | | |

For the proof against splitting failure $N^0_{Rk,c}$ has to be replaced by $N^0_{Rk,p}$.

**Table C6** **Displacements under tension loads**

| **Anchor Sizes** | | | **M8** | **M10** | **M12** | **M16** | **M20** | **M24** |
|---|---|---|---|---|---|---|---|---|
| Tension load | N | [kN] | 8 | 12 | 16 | 20 | 30 | 38 |
| Displacement | $\delta_{N0}$ | [mm] | 0,1 | 0,2 | 0,2 | 0,2 | 0,5 | 0,4 |
| | $\delta_{N\infty}$ | [mm] | 0,5 | | | | | |

**Table C7** **Metal parts made of zinc plated or hot dip galvanised steel**

| Design method A, characteristic values tor shear loads | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Anchor Sizes** | | | **M8** | **M10** | **M12** | **M16** | **M20** | **M24** |
| **Steel failure without lever arm** | | | | | | | | |
| Characteristic resistance **property class 5.8** | $V^0_{Rk,s}$ | [kN] | 9 | 14 | 21 | 39 | 61 | 88 |
| Characteristic resistance **property class 8 .8** | $V^0_{Rk,s}$ | [kN] | 15 | 23 | 33 | 63 | 98 | 141 |
| Ductility factor | $k_7$ | [-] | 0,8 | | | | | |
| **Steel failure with lever arm** | | | | | | | | |
| Characteristic resistance **property class 5.8** | $M^0_{Rk,s}$ | [Nm] | 19 | 37 | 65 | 166 | 325 | 561 |
| Characteristic resistance **property class 8 .8** | $M^0_{Rk,s}$ | [Nm] | 30 | 60 | 105 | 266 | 519 | 898 |
| **Pry out failure** | | | | | | | | |
| Factor | $k_8$ | [-] | 2,0 | | | | | |
| Installation factor | $\gamma_{inst}$ | [-] | 1,0 | | | | | |
| **Concrete edge failure** | | | | | | | | |
| Effective length of anchor | $\ell_f$ | [mm] | 80 | 90 | 110 | 125 | 170 | 210 |
| Outside diameter of anchor | $d_{nom}$ | [mm] | 10 | 12 | 14 | 18 | 25 | 28 |
| Installation factor | $\gamma_{inst}$ | [-] | 1,0 | | | | | |

**Table C8** **Displacements under shear loads**

| **Anchor Sizes** | | | **M8** | **M10** | **M12** | **M16** | **M20** | **M24** |
|---|---|---|---|---|---|---|---|---|
| Shear load | V | [kN] | 5 | 8 | 12 | 22 | 35 | 50 |
| Displacement | $\delta_{v0}$ | [mm] | 2 | 3 | 3 | 4 | 5 | 5 |
| | $\delta_{v\infty}$ | [mm] | 4 | 5 | 5 | 6 | 7 | 7 |

**Table C9** **Metal parts made of stainless steel 1.4401, 1.4404 or 1.4571**

| Design method A, characteristic values for shear loads | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Anchor Sizes** | | | **M8** | **M10** | **M12** | **M16** | **M20** | **M24** |
| **Steel failure without lever arm** | | | | | | | | |
| Characteristic resistance **strength class A4- 70** | $V^0_{Rk,s}$ | [kN] | 13 | 20 | 29 | 55 | 86 | 124 |
| Characteristic resistance **strength class A4-80** | $V^0_{Rk,s}$ | [kN] | 15 | 23 | 33 | 62 | 98 | 141 |
| Ductility factor | $k_7$ | [-] | 0,8 | | | | | |
| **Steel failure with lever arm** | | | | | | | | |
| Characteristic bending moment **strength class A4- 70** | $M^0_{Rk,s}$ | [Nm] | 26 | 52 | 92 | 233 | 454 | 785 |
| Characteristic bending moment **strength class A4-80** | $M^0_{Rk,s}$ | [Nm] | 30 | 60 | 105 | 266 | 519 | 898 |
| **Pry out failure** | | | | | | | | |
| Factor | $k_8$ | [-] | 2,0 | | | | | |
| Installation factor | $\gamma_{inst}$ | [-] | 1,0 | | | | | |
| **Concrete edge failure** | | | | | | | | |
| Effective length of anchor | $\ell_f$ | [mm] | 80 | 90 | 110 | 125 | 170 | 210 |
| Outside diameter of anchor | $d_{nom}$ | [mm] | 10 | 12 | 14 | 18 | 25 | 28 |
| Installation factor | $\gamma_{inst}$ | [-] | 1,0 | | | | | |

**Table C10** **Displacements under shear loads**

| **Anchor Sizes** | | | **M8** | **M10** | **M12** | **M16** | **M20** | **M24** |
|---|---|---|---|---|---|---|---|---|
| Shear load | V | [kN] | 5 | 8 | 12 | 22 | 35 | 50 |
| Displacement | $\delta_{v0}$ | [mm] | 2 | 3 | 3 | 4 | 5 | 5 |
| | $\delta_{v\infty}$ | [mm] | 4 | 5 | 5 | 6 | 7 | 7 |

**Table C11** **Metal parts made of high corrosion resistant steel 1.4529 or 1.4565**

| Design method A, characteristic values for shear loads | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Anchor Sizes** | | | **M8** | **M10** | **M12** | **M16** | **M20** | **M24** |
| **Steel failure without lever arm** | | | | | | | | |
| Characteristic resistance **strength class 70** | $V^0_{Rk,s}$ | [kN] | 13 | 20 | 29 | 55 | 86 | 124 |
| Ductility factor | $k_7$ | [-] | 0,8 | | | | | |
| **Steel failure with lever arm** | | | | | | | | |
| Characteristic bending moment **strength class 70** | $M^0_{Rk,s}$ | [Nm] | 26 | 52 | 92 | 233 | 454 | 785 |
| **Pry out failure** | | | | | | | | |
| Factor | $k_8$ | [-] | 2,0 | | | | | |
| Installation factor | $\gamma_{inst}$ | [-] | 1,0 | | | | | |
| **Concrete edge failure** | | | | | | | | |
| Effective length of anchor | $\ell_f$ | [mm] | 80 | 90 | 110 | 125 | 170 | 210 |
| Outside diameter of anchor | $d_{nom}$ | [mm] | 10 | 12 | 14 | 18 | 25 | 28 |
| Installation factor | $\gamma_{inst}$ | [-] | 1,0 | | | | | |

**Table C12** **Displacements under shear loads**

| **Anchor Sizes** | | | **M8** | **M10** | **M12** | **M16** | **M20** | **M24** |
|---|---|---|---|---|---|---|---|---|
| Shear load | V | [kN] | 5 | 8 | 12 | 22 | 35 | 50 |
| Displacement | $\delta_{v0}$ | [mm] | 2 | 3 | 3 | 4 | 5 | 5 |
| | $\delta_{v\infty}$ | [mm] | 4 | 5 | 5 | 6 | 7 | 7 |

INDO CONSTRUCTION FASTENING SYSTEMS

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# INDO SPARK CONSTRUCTION SERVICES


## CORPORATE OFFICE

198, E ward, Tararani Chowk,
Near Geeta Mandir,
Kolhapur - 416 003 (Mah.India)
Toll Free : 1800 123 500 023
E-mail : mail@indospark.com


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