



INDO CONSTRUCTION FASTENING SYSTEMS

A brand of Indo Spark Group Since 1978



# Anchor fasteners

Indo Prime Bolt Zone  
(IPBZ A4)

# Indo Construction Fastening Systems

Indo Construction Fastening Systems (ICFS) is a 45 years company, having expertise and operations in the following three verticals:

- ICFS Anchor Fastening Systems
- Construction Services
- ICFS Anchor Designer

We have chemical and mechanical anchors usable for installing furniture, fixtures & structures at site. Based on the design load parameters, we even suggest correct type of chemical, diameter of anchor bolts, embedment depth and chemical consumption per hole.



## Our story

*«From an automotive workshop employing just 2 in 1978 to what we are today-a well-known, successful, respectable, leading business house in India.*

*It was indeed a long journey. A journey full of challenges, hardships, bottlenecks. But we came out intact and grew many folds - vertical and horizontal.*

*The best assets of ours, I think are our reputation for honesty, fair dealing, timely delivery and quality.*

*As I look back there are two main factors which made Indo Spark blossom. First is the wisdom and honesty of our chairperson Mr. Tilakchand Ingale along with his trust in the employees and second is the wholehearted, sincere, hard work put up by our employees – young and old including technicians and workmen.*

*One thing is certain*

*We have never stopped growing.*

**Sandeep Ingale, CEO Indo Spark Group**



# Indo Prime Bolt Zone (IPBZ A4)

## IPBZ



### Features & benefits

- Stainless steel anchor for the highest corrosion resistance
- High performance in cracked and Non-cracked concrete confirmed by ETA Option 1
- Highest quality ensures maximum load capability
- For applications requiring fire resistance up to 120 minutes
- Suitable for reduced embedment to avoid contact with reinforcement
- Embedment depth markings help to ensure precise installation of the anchor
- Design of IPBZ allows drilling and installing directly through the fixture and helps to reduce installation time
- Suitable for installation in corrosive environments category C1, C2, C3, C4 And C5
- Anchors can be used in earthquake risk zones - seismic category C1 and C

### Applications

- Cladding restraints
- Barriers
- Structural steel
- Curtain walling
- Handrails
- Heavy Plant
- Balustrading
- Passenger lifts
- Facades
- Fencing & gates manufacturing and installation
- Masonry support
- Platforms
- Public seating
- Racking systems

### Base Materials Approved for use in

- Cracked concrete C20/25-C50/60
- Non-cracked concrete C20/25-C50/60
- Reinforced concrete
- Unreinforced concrete



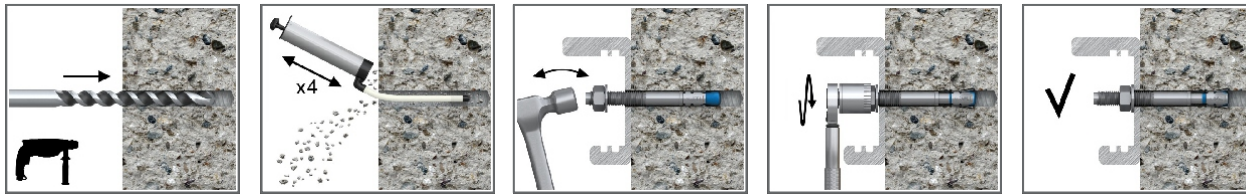
**Also suitable for use in Natural Stone (after site testing)**



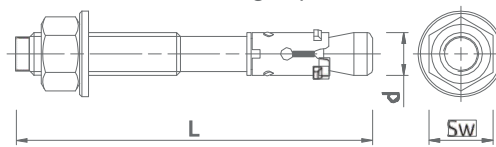
ETA23/0615

# Indo Prime Bolt Zone (IPBZ A4)



## Product installation guide



- Drill a hole of required diameter and depth
- Clear the hole of drilling dust and debris (using blow pump or equivalent method)
- Lightly tap the through bolt through the fixture into hole with a hammer until fixing depth is reached
- Tighten to the recommended torque

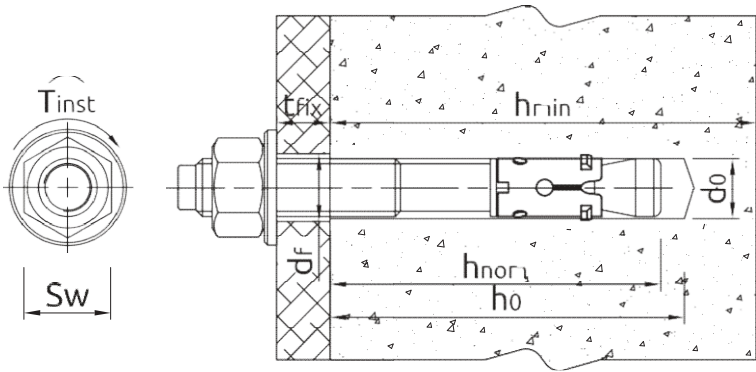


## Product Information

| Size | Product code  | Anchor          |               | Fixture                        |   |                          |
|------|---|-----------------|---------------|--------------------------------|---|--------------------------|
|      |   | Diameter d (mm) | Length L (mm) | Max. thickness $t_{fix}$ for : |   | Hole diameter $d_f$ (mm) |
|      |   |                 |               | $h_{nom, red}$                 | $h_{nom, std}$  |                          |
| M8   | IPBZA4-08060/10   | 8               | 60            | 10                             | -   | 9                        |
| M8   | IPBZA4-08075/10   | 8               | 75            | 25                             | 10  | 9                        |
| M8   | IPBZA4-08085/20   | 8               | 85            | 35                             | 20  | 9                        |
| M8   | IPBZA4-08095/30   | 8               | 95            | 45                             | 30  | 9                        |
| M8   | IPBZA4-08105/40   | 8               | 105           | 55                             | 40  | 9                        |
| M8   | IPBZA4-08115/50   | 8               | 115           | 65                             | 50  | 9                        |
| M10  | IPBZA4-10065/5  | 10              | 65            | 5                              | -   | 12                       |
| M10  | IPBZA4-10080/20   | 10              | 80            | 20                             | -   | 12                       |
| M10  | IPBZA4-10095/15   | 10              | 95            | 35                             | 15  | 12                       |
| M10  | IPBZA4-10115/35   | 10              | 115           | 55                             | 35  | 12                       |
| M10  | IPBZA4-10130/50   | 10              | 130           | 70                             | 50  | 12                       |
| M10  | IPBZA4-10140/60   | 10              | 140           | 80                             | 60  | 12                       |
| M12  | IPBZA4-12080/5  | 12              | 80            | 5                              | -   | 14                       |
| M12  | IPBZA4-12100/5  | 12              | 100           | 25                             | 5   | 14                       |
| M12  | IPBZA4-12115/20   | 12              | 115           | 40                             | 20  | 14                       |
| M12  | IPBZA4-12125/30   | 12              | 125           | 50                             | 30  | 14                       |
| M12  | IPBZA4-12150/55   | 12              | 150           | 75                             | 55  | 14                       |
| M12  | IPBZA4-12180/85   | 12              | 180           | 105                            | 85  | 14                       |
| M16  | IPBZA4-16125/5  | 16              | 125           | 25                             | 5   | 18                       |
| M16  | IPBZA4-16140/20   | 16              | 140           | 40                             | 20  | 18                       |
| M16  | IPBZA4-16150/30   | 16              | 150           | 50                             | 30  | 18                       |
| M16  |  | 16              | 180           | 80                             |  | 18                       |

# Indo Prime Bolt Zone (IPBZ A4)

## Installation Data



| Size                        |                   |      | M8 | M10 | M12 | M16 |
|-----------------------------|-------------------|------|----|-----|-----|-----|
| Thread diameter             | d                 | (mm) | 8  | 10  | 12  | 16  |
| Hole diameter in substrate  | d <sub>0</sub>    | (mm) | 8  | 10  | 12  | 16  |
| Installation torque         | T <sub>inst</sub> | (Nm) | 15 | 30  | 50  | 100 |
| Wrench size                 | Sw                | (mm) | 13 | 17  | 19  | 24  |
| External diameter of washer |                   | (mm) | 16 | 20  | 24  | 30  |

| Size                                     |                     |      | M8  | M10 | M12 | M16 | M8                      | M10 | M12 | M16 |
|--|---------------------|------|-----|-----|-----|-----|-------------------------|-----|-----|-----|
| Standard Embedment Depth                 |                     |      |     |     |     |     | Reduced Embedment Depth |     |     |     |
| Min.hole depth in substrate              | h <sub>0,s</sub>    | (mm) | 65  | 80  | 90  | 110 | 50                      | 60  | 70  | 90  |
| Min.installation depth                   | h <sub>nom,s</sub>  | (mm) | 55  | 69  | 80  | 100 | 40                      | 49  | 60  | 100 |
| Min.substrate thickness                  | h <sub>min,s</sub>  | (Nm) | 100 | 120 | 140 | 170 | 100                     | 100 | 100 | 130 |
| Min.spacing (Non-cracked concrete)       | s <sub>min, s</sub> | (mm) | 55  | 70  | 90  | 135 | 50                      | 70  | 120 | 150 |
| Min.spacing (Cracked concrete)           | s <sub>min, s</sub> | (mm) | 55  | 70  | 90  | 135 | 50                      | 70  | 120 | 150 |
| Min.edge distance (Non-cracked concrete) | c <sub>min, s</sub> | (mm) | 40  | 50  | 55  | 80  | 50                      | 60  | 75  | 90  |
| Min.edge distance (Cracked concrete)     | c <sub>min, s</sub> | (mm) | 40  | 45  | 55  | 70  | 40                      | 50  | 70  | 85  |

## Mechanical Properties

| Size  |                                |                      | M8    | M10   | M12    | M16    |
|---|--------------------------------|----------------------|-------|-------|--------|--------|
| Nominal ultimate tensile strength - tension | f <sub>uk</sub>                | [N/mm <sup>2</sup> ] | 600   | 600   | 550    | 550    |
| Nominal yield strength - tension            | f <sub>yk</sub>                | [N/mm <sup>2</sup> ] | 450   | 450   | 413    | 413    |
| Cross sectional area - tension              | A <sub>s</sub>                 | [mm <sup>2</sup> ]   | 36.6  | 58    | 84.3   | 157    |
| Elastic section modulus                     | W <sub>el</sub>                | [mm <sup>2</sup> ]   | 50.27 | 98.17 | 169.65 | 402.12 |
| Characteristic bending resistance           | M <sup>0</sup> <sub>Rk,s</sub> | [Nm]                 | 22    | 45    | 72     | 180    |
| Design bending resistance                   | M                              | [Nm]                 | 18    | 36    | 57     | 144    |

# Basic Performance Data

Performance data for single anchor without influence of edge distance and spacing

| Size                              |      | M8    | M10   | M12   | M16   |
|-----------------------------------|------|-------|-------|-------|-------|
| Non-Cracked Concrete              |      |       |       |       |       |
| Standard embedment depth $h_{ef}$ | (mm) | 47.00 | 59.00 | 68.00 | 85.00 |
| Reduced embedment depth $h_{ef}$  | (mm) | 32.00 | 39.00 | 48.00 | 65.00 |
| Cracked Concrete                  |      |       |       |       |       |
| Standard embedment depth $h_{ef}$ | (mm) | 47.00 | 59.00 | 68.00 | 85.00 |
| Reduced embedment depth $h_{ef}$  | (mm) | 32.00 | 39.00 | 48.00 | 65.00 |

## Mean Unlimate Load

| Size                     |      | M8                      | M10   | M12   | M16   |
|--------------------------|------|-------------------------|-------|-------|-------|
| Non-Cracked Concrete     |      | Tension Load $N_{Ru,m}$ |       |       |       |
| Standard embedment depth | (kN) | 15.40                   | 22.80 | 29.20 | 55.80 |
| Reduced embedment depth  | (kN) | 10.40                   | 16.00 | 22.10 | 37.90 |
| Cracked Concrete         |      |                         |       |       |       |
| Standard embedment depth | (kN) | 9.70                    | 11.50 | 18.60 | 30.40 |
| Reduced embedment depth  | (kN) | 5.60                    | 9.80  | 13.40 | 22.20 |

## Shear Load $V_{Ru,m}$

| Size                     |      | M8    | M10   | M12   | M16   |
|--------------------------|------|-------|-------|-------|-------|
| Non-Cracked Concrete     |      |       |       |       |       |
| Standard embedment depth | (kN) | 14.00 | 22.20 | 29.60 | 54.50 |
| Reduced embedment depth  | (kN) | 12.22 | 19.73 | 22.45 | 54.50 |
| Cracked Concrete         |      |       |       |       |       |
| Standard embedment depth | (kN) | 12.87 | 21.20 | 29.60 | 54.50 |
| Reduced embedment depth  | (kN) | 8.60  | 13.88 | 15.80 | 49.78 |

## Characteristic Load

| Size                     |      | M8                    | M10   | M12   | M16   |
|--------------------------|------|-----------------------|-------|-------|-------|
| Non-Cracked Concrete     |      | Tension Load $N_{RK}$ |       |       |       |
| Standard embedment depth | (kN) | 9.00                  | 16.00 | 25.00 | 38.55 |
| Reduced embedment depth  | (kN) | 7.50                  | 11.98 | 16.36 | 25.78 |
| Cracked Concrete         |      |                       |       |       |       |
| Standard embedment depth | (kN) | 6.00                  | 9.00  | 12.00 | 25.00 |
| Reduced embedment depth  | (kN) | 3.00                  | 7.50  | 9.00  | 16.00 |

# Basic Performance Data

## Characteristic Load

| Size                     |      | M8                           | M10   | M12   | M16   |
|--------------------------|------|------------------------------|-------|-------|-------|
| Non-Cracked Concrete     |      | Tension Load N <sub>Rk</sub> |       |       |       |
| Standard embedment depth | (kN) | 9.00                         | 16.00 | 25.00 | 38.55 |
| Reduced embedment depth  | (kN) | 7.50                         | 11.98 | 16.36 | 25.78 |

|                          |      |      |      |       |       |
|--------------------------|------|------|------|-------|-------|
| Cracked Concrete         |      |      |      |       |       |
| Standard embedment depth | (kN) | 6.00 | 9.00 | 12.00 | 25.00 |
| Reduced embedment depth  | (kN) | 3.00 | 7.50 | 9.00  | 16.00 |

| Size                     |      | M8                         | M10   | M12   | M16   |
|--------------------------|------|----------------------------|-------|-------|-------|
| Non-Cracked Concrete     |      | Shear Load V <sub>Rk</sub> |       |       |       |
| Standard embedment depth | (kN) | 11.70                      | 18.50 | 24.60 | 45.40 |
| Reduced embedment depth  | (kN) | 8.90                       | 14.38 | 16.36 | 45.40 |

|                          |      |       |       |       |       |
|--------------------------|------|-------|-------|-------|-------|
| Cracked Concrete         |      |       |       |       |       |
| Standard embedment depth | (kN) | 11.10 | 15.61 | 24.60 | 45.40 |
| Reduced embedment depth  | (kN) | 6.23  | 10.06 | 11.45 | 36.09 |

| Size                     |      | M8                           | M10   | M12   | M16   |
|--------------------------|------|------------------------------|-------|-------|-------|
| Non-Cracked Concrete     |      | Tension Load N <sub>Rd</sub> |       |       |       |
| Standard embedment depth | (kN) | 5.00                         | 10.67 | 16.70 | 25.70 |
| Reduced embedment depth  | (kN) | 4.17                         | 6.66  | 10.91 | 17.19 |

|                          |      |      |      |      |       |
|--------------------------|------|------|------|------|-------|
| Cracked Concrete         |      |      |      |      |       |
| Standard embedment depth | (kN) | 3.33 | 6.00 | 8.00 | 16.67 |
| Reduced embedment depth  | (kN) | 1.67 | 4.17 | 6.00 | 10.67 |

| Size                     |      | M8                         | M10   | M12   | M16   |
|--------------------------|------|----------------------------|-------|-------|-------|
| Non-Cracked Concrete     |      | Shear Load V <sub>Rd</sub> |       |       |       |
| Standard embedment depth | (kN) | 9.36                       | 14.80 | 19.68 | 36.32 |
| Reduced embedment depth  | (kN) | 5.94                       | 9.59  | 10.91 | 34.37 |

|                          |      |      |       |       |       |
|--------------------------|------|------|-------|-------|-------|
| Cracked Concrete         |      |      |       |       |       |
| Standard embedment depth | (kN) | 7.40 | 10.40 | 19.68 | 35.98 |
| Reduced embedment depth  | (kN) | 4.16 | 6.71  | 7.63  | 24.06 |

# Design Performance Data

(-)failure is not decisive

| Size                     |          |      | M8    |       | M10   |       | M12   |       | M16   |       |
|--------------------------|----------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Effective bed ment depth | $h_{ef}$ | (mm) | 32.00 | 47.00 | 39.00 | 59.00 | 48.00 | 68.00 | 65.00 | 85.00 |

## Steel Failure

| Size                      |               |      | M8    |       | M10   |       | M12   |       | M16   |       |
|---------------------------|---------------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Characteristic Resistance | $N_{Rk,s}$    | (kN) | 21.20 | 21.20 | 33.60 | 33.60 | 44.80 | 44.80 | 82.60 | 82.60 |
| Partial Safety Factor     | $\gamma_{Ms}$ | -    | 1.50  | 1.50  | 1.50  | 1.50  | 1.50  | 1.50  | 1.50  | 1.50  |

## Pull-out Failure Non-Cracked Concrete C20/25

| Size                      |            |      | M8   |      | M10   |       | M12 |       | M16 |   |
|---------------------------|------------|------|------|------|-------|-------|-----|-------|-----|---|
| Characteristic Resistance | $N_{Rk,p}$ | (kN) | 7.50 | 9.00 | 12.00 | 16.00 | -   | 25.00 | -   | - |

## Pull-out Failure Cracked Concrete C20/25

| Size                      |            |      | M8   |      | M10  |      | M12  |       | M16   |       |
|---------------------------|------------|------|------|------|------|------|------|-------|-------|-------|
| Characteristic Resistance | $N_{Rk,p}$ | (kN) | 3.00 | 6.00 | 7.50 | 9.00 | 9.00 | 12.00 | 16.00 | 25.00 |

## Pull-out Failure

| Size                                 |                 |   | M8   |      | M10  |      | M12  |      | M16  |      |
|--------------------------------------|-----------------|---|------|------|------|------|------|------|------|------|
| Installation Safety factor           | $\gamma_{inst}$ | - | 1.20 | 1.20 | 1.20 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Increasing factors for NRd,p- C30/37 | $\psi$          | - | 1.07 | 1.16 | 1.07 | 1.26 | 1.16 | 1.23 | 1.18 | 1.18 |
| Increasing factors for NRd,p- C40/50 | $\Psi$          | - | 1.13 | 1.33 | 1.13 | 1.52 | 1.32 | 1.45 | 1.37 | 1.37 |
| Increasing factors for NRd,p- C50/60 | $\Psi$          | - | 1.20 | 1.50 | 1.20 | 1.78 | 1.49 | 1.67 | 1.55 | 1.55 |

## Concrete Cone Failure

| Size                        |                 |   | M8    |       | M10   |       | M12   |       | M16   |       |
|-----------------------------|-----------------|---|-------|-------|-------|-------|-------|-------|-------|-------|
| Factor for cracked concrete | $k_{cr, N}$     | - | 7.70  | 7.70  | 7.70  | 7.70  | 7.70  | 7.70  | 7.70  | 7.70  |
| Factor for cracked concrete | $k_{ucr, N}$    | - | 11.00 | 11.00 | 11.00 | 11.00 | 11.00 | 11.00 | 11.00 | 11.00 |
| Installation safety factor  | $\gamma_{inst}$ | - | 1.20  | 1.20  | 1.20  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| Spacing                     | $S_{cr, N}$     | - | 96.00 | 141.0 | 117.0 | 177.0 | 144.0 | 204.0 | 195.0 | 255.0 |
| Edge distance               | $C_{cr, N}$     | - | 48.00 | 71.00 | 59.00 | 89.00 | 72.00 | 102.0 | 98.00 | 128.0 |

## Concrete Splitting Failure

|                            |                     |      | M8    |       | M10   |       | M12   |       | M16   |       |
|----------------------------|---------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Spacing                    | $S_{cr, sp}$        | (mm) | 160.0 | 240.0 | 200.0 | 300.0 | 250.0 | 340.0 | 320.0 | 430.0 |
| Edge distance              | $C_{cr, sp}$        | (mm) | 80.00 | 120.0 | 100.0 | 150.0 | 125.0 | 170.0 | 160.0 | 215.0 |
| Installation safety factor | $\gamma_{in, st N}$ | -    | 1.20  | 1.20  | 1.20  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |



# Design Performance Data

## Steel Failure

| Size  |               |      | M8    |       | M10   |       | M12   |       | M16   |       |
|---|---------------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Characteristic resistance without lever arm | $V_{rk,s}$    | (kN) | 11.70 | 11.70 | 18.50 | 18.50 | 24.60 | 24.60 | 45.40 | 45.40 |
| Ductility factor                            | $k_7$         | -    | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| Characteristic resistance without lever arm | $M_{rk,s}$    | (Nm) | 22.00 | 22.00 | 42.00 | 45.00 | 72.00 | 72.00 | 180.0 | 180.0 |
| Partial safety factor                       | $\gamma_{Ms}$ | -    | 1.25  | 1.25  | 1.25  | 1.25  | 1.25  | 1.25  | 1.25  | 1.25  |

## Concrete Pry-Out Failure

| Size                       |                 |   | M8   |      | M10  |      | M12  |      | M16  |      |
|----------------------------|-----------------|---|------|------|------|------|------|------|------|------|
| Factor                     | $k$             | - | 1.00 | 1.00 | 1.20 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 |
| Installation safety factor | $\gamma_{inst}$ | - | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

## Concrete Edge Failure

| Size                       |                 |      | M8    |       | M10   |       | M12   |       | M16   |       |
|----------------------------|-----------------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Effective length of anchor | $l_f$           | (mm) | 32.00 | 47.00 | 39.00 | 59.00 | 48.00 | 68.00 | 65.00 | 85.00 |
| Anchor diameter            | $d_{nom}$       | (mm) | 8.00  | 8.00  | 10.00 | 10.00 | 12.00 | 12.00 | 16.00 | 16.00 |
| Installation safety factor | $\gamma_{inst}$ | -    | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

The use of the reduced embedment depth M8 & M10 is restricted to anchoring statically indeterminate structural components

# Design Performance Data

Resistance to tension and shear loads under fire exposure - Reduced embedment depth

| Size |  |  | M8 |  | M10 |  | M12 |  | M16 |  |
|------|--|--|----|--|-----|--|-----|--|-----|--|
|------|--|--|----|--|-----|--|-----|--|-----|--|

R(for EI) = 30 min

|                           |          |      |       |       |       |       |       |       |       |       |
|---------------------------|----------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Effective embedment depth | $h_{ef}$ | (mm) | 32.00 | 47.00 | 39.00 | 59.00 | 48.00 | 68.00 | 65.00 | 85.00 |
|---------------------------|----------|------|-------|-------|-------|-------|-------|-------|-------|-------|

## Tension Load Steel Failure

|                           |            |      |      |      |      |      |      |      |      |      |
|---------------------------|------------|------|------|------|------|------|------|------|------|------|
| Characteristic resistance | $N_{Rk,s}$ | (kN) | 0.70 | 0.70 | 1.50 | 1.50 | 2.50 | 2.50 | 4.70 | 4.70 |
|---------------------------|------------|------|------|------|------|------|------|------|------|------|

## Pull-Out Test Failure

|                           |            |      |      |      |      |      |      |      |      |      |
|---------------------------|------------|------|------|------|------|------|------|------|------|------|
| Characteristic resistance | $N_{Rk,s}$ | (kN) | 0.80 | 1.50 | 1.90 | 2.30 | 2.30 | 3.00 | 4.00 | 6.30 |
|---------------------------|------------|------|------|------|------|------|------|------|------|------|

## Steel Failure Shareload

|   |            |      |      |      |      |      |      |      |       |       |
|---|------------|------|------|------|------|------|------|------|-------|-------|
| Characteristic resistance without lever arm | $V_{Rk,s}$ | (kN) | 0.70 | 0.70 | 1.50 | 1.50 | 2.50 | 2.50 | 4.70  | 4.70  |
| Characteristic resistance without lever arm | $M_{Rk,s}$ | (Nm) | 0.70 | 0.70 | 1.90 | 1.90 | 3.90 | 3.90 | 10.00 | 10.00 |

R(forEI) = 60 min

|                           |          |      |       |       |       |       |       |       |       |       |
|---------------------------|----------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Effective embedment depth | $h_{ef}$ | (mm) | 32.00 | 47.00 | 39.00 | 59.00 | 48.00 | 68.00 | 65.00 | 85.00 |
|---------------------------|----------|------|-------|-------|-------|-------|-------|-------|-------|-------|

## Steel Failure

|                           |            |      |      |      |      |      |      |      |      |      |
|---------------------------|------------|------|------|------|------|------|------|------|------|------|
| Characteristic resistance | $N_{Rk,s}$ | (kN) | 0.60 | 0.60 | 1.20 | 1.20 | 2.10 | 2.10 | 3.90 | 3.90 |
|---------------------------|------------|------|------|------|------|------|------|------|------|------|

## Pull-Out Test Failure

|                           |            |      |      |      |      |      |      |      |      |      |
|---------------------------|------------|------|------|------|------|------|------|------|------|------|
| Characteristic resistance | $N_{Rk,s}$ | (kN) | 0.80 | 1.50 | 1.90 | 2.30 | 2.30 | 3.00 | 4.00 | 6.30 |
|---------------------------|------------|------|------|------|------|------|------|------|------|------|

| Size  |            |      | M8         |      | M10  |      | M12  |      | M16  |      |
|---|------------|------|------------|------|------|------|------|------|------|------|
| Steel Failure                               |            |      | Shear load |      |      |      |      |      |      |      |
| Characteristic resistance without lever arm | $V_{Rk,s}$ | (kN) | 0.60       | 0.60 | 1.20 | 1.20 | 2.10 | 2.10 | 3.90 | 3.90 |
| Characteristic resistance without lever arm | $M_{Rk,s}$ | (Nm) | 0.60       | 0.60 | 1.50 | 1.50 | 3.30 | 3.30 | 8.30 | 8.30 |

|                           |          |      |       |       |       |       |       |       |       |       |
|---------------------------|----------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Effective embedment depth | $h_{ef}$ | (mm) | 32.00 | 47.00 | 39.00 | 59.00 | 48.00 | 68.00 | 65.00 | 85.00 |
|---------------------------|----------|------|-------|-------|-------|-------|-------|-------|-------|-------|

| Steel Failure             |            |      | Tension Load |      |      |      |      |      |      |      |
|---------------------------|------------|------|--------------|------|------|------|------|------|------|------|
| Characteristic resistance | $N_{Rk,p}$ | (kN) | 0.40         | 0.40 | 0.90 | 0.90 | 1.70 | 1.70 | 3.10 | 3.10 |

| Pull-Out Failure          |            |      |      |      |      |      |      |      |      |      |
|---------------------------|------------|------|------|------|------|------|------|------|------|------|
| Characteristic resistance | $N_{Rk,p}$ | (kN) | 0.80 | 1.50 | 1.90 | 2.30 | 2.30 | 3.00 | 4.00 | 6.30 |

| Steel Failure                               | Shear load |      |      |      |      |      |      |      |      |      |
|---|------------|------|------|------|------|------|------|------|------|------|
| Characteristic resistance without lever arm | $V_{Rk,s}$ | (kN) | 0.40 | 0.40 | 0.90 | 0.90 | 1.70 | 1.70 | 3.10 | 3.10 |
| Characteristic resistance without lever arm | $M_{Rk,s}$ | (Nm) | 0.40 | 0.40 | 1.20 | 1.20 | 2.60 | 2.60 | 6.70 | 6.70 |

| R(for EI) = 120 min       |          |      |       |       |       |       |       |       |       |       |
|---------------------------|----------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Effective embedment depth | $h_{ef}$ | (mm) | 32.00 | 47.00 | 39.00 | 59.00 | 48.00 | 68.00 | 65.00 | 85.00 |

| Steel Failure             |                 | Tension Load |      |      |      |      |      |      |      |  |
|---------------------------|-----------------|--------------|------|------|------|------|------|------|------|--|
| Characteristic resistance | $N_{Rk,s}$ (kN) | 0.40         | 0.40 | 0.80 | 0.80 | 1.30 | 1.30 | 2.50 | 2.50 |  |

| Pull-Out Failure          |            |      |      |      |      |      |      |      |      |      |
|---------------------------|------------|------|------|------|------|------|------|------|------|------|
| Characteristic resistance | $N_{Rk,p}$ | (kN) | 0.60 | 1.20 | 1.50 | 1.80 | 1.80 | 2.40 | 3.20 | 5.00 |

| Steel Failure                               | Shear load |      |      |      |      |      |      |      |      |      |
|---|------------|------|------|------|------|------|------|------|------|------|
| Characteristic resistance without lever arm | $V_{Rk,s}$ | (kN) | 0.40 | 0.40 | 0.80 | 0.80 | 1.30 | 1.30 | 2.50 | 2.50 |
| Characteristic resistance without lever arm | $M_{Rk,s}$ | (Nm) | 0.40 | 0.40 | 1.00 | 1.00 | 2.10 | 2.10 | 5.30 | 5.30 |

| Size                      |          |      | M8    |       | M10   |       | M12   |       | M16   |       |
|---------------------------|----------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Effective embedment depth | $h_{ef}$ | (mm) | 32.00 | 47.00 | 39.00 | 59.00 | 48.00 | 68.00 | 65.00 | 85.00 |

[illegible]

| Tension Load, Pull-Out Failure |            |      |      |      |      |      |      |       |       |       |
|--------------------------------|------------|------|------|------|------|------|------|-------|-------|-------|
| Characteristic resistance      | $N_{Rk,p}$ | (kN) | 3.00 | 6.00 | 7.50 | 9.00 | 9.00 | 12.00 | 16.00 | 25.00 |
| Intsallation safety factor     | $Y_{inst}$ | -    | 1.20 | 1.20 | 1.20 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  |

[illegible]

## Design Performance Data

Allowable values for resistance in case of Seismic performance category C2

| Size                      |          |      | M10   |       | M12   |       |
|---------------------------|----------|------|-------|-------|-------|-------|
| Effective embedment depth | $h_{ef}$ | (mm) | 39.00 | 59.00 | 48.00 | 68.00 |

Tension Load, Steel Failure

|                           |                        |      |       |       |       |       |
|---------------------------|------------------------|------|-------|-------|-------|-------|
| Characteristic resistance | $N_{Rk,s}$             | (kN) | 33.60 | 33.60 | 44.80 | 44.80 |
| Partial safety factory    | $\gamma_{MsN, seisc2}$ | -    | 1.50  | 1.50  | 1.50  | 1.50  |

Tension Load, Pull Out Failure

|                           |                 |      |      |      |      |      |
|---------------------------|-----------------|------|------|------|------|------|
| Characteristic resistance | $N_{Rk,p}$      | (kN) | 2.60 | 3.00 | 3.00 | 4.20 |
| Partial safety factory    | $\gamma_{inst}$ | -    | 1.20 | 1.00 | 1.00 | 1.00 |

Allowable values for resistance in case of Seismic performance category C2

| Size |  |  | M10 |  | M12 |  |
|------|--|--|-----|--|-----|--|
|------|--|--|-----|--|-----|--|

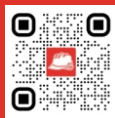
Shear Load, Steel Failure

|   |                        |      |      |      |      |       |
|---|------------------------|------|------|------|------|-------|
| Characteristic resistance without lever arm | $V_{Rk,s}$             | (kN) | -    | 8.30 | -    | 11.10 |
| Partial safety factory                      | $\gamma_{MsV, seisc2}$ | -    | 1.25 | 1.25 | 1.25 | 1.25  |

## Product Commercial Data

| Product Code       | Anchor Diameter | Anchor Length | Box Quantity (pcs) Outer | Pallet | Weight (kg) Outer | Pallet |
|--------------------|-----------------|---------------|--------------------------|--------|-------------------|--------|
| IPBZA4-08075/10 1) | 8               | 60            | 100                      | 16000  | 2.6               | 441.0  |
| IPBZA4-08075/10 1) | 8               | 75            | 100                      | 16000  | 3.1               | 520.1  |
| IPBZA4-08085/20 1) | 8               | 85            | 100                      | 16000  | 3.4               | 571.4  |
| IPBZA4-08095/30 1) | 8               | 95            | 100                      | 12000  | 3.7               | 474.0  |
| IPBZA4-08105/40 1) | 8               | 105           | 50                       | 8000   | 2.0               | 354.8  |
| IPBZA4-08115/50 1) | 8               | 115           | 100                      | 12000  | 4.3               | 547.9  |
| IPBZA4-10065/5 1)  | 10              | 65            | 50                       | 8000   | 2.4               | 410.5  |
| IPBZA4-10080/20 1) | 10              | 80            | 50                       | 8000   | 2.8               | 469.7  |
| IPBZA4-10095/15 1) | 10              | 95            | 50                       | 8000   | 3.1               | 529.7  |
| IPBZA4-10115/35 1) | 10              | 115           | 50                       | 6000   | 3.7               | 468.1  |
| IPBZA4-10130/50 1) | 10              | 130           | 50                       | 8000   | 4.0               | 670.0  |
| IPBZA4-10140/60 1) | 10              | 140           | 50                       | 8000   | 4.3               | 709.7  |
| IPBZA4-12080/5 1)  | 12              | 80            | 50                       | 8000   | 4.1               | 688.7  |
| IPBZA4-12100/5 1)  | 12              | 100           | 50                       | 8000   | 4.8               | 797.4  |
| IPBZA4-12115/20 1) | 12              | 115           | 50                       | 6000   | 5.4               | 676.4  |
| IPBZA4-12125/30 1) | 12              | 125           | 50                       | 6000   | 5.8               | 721.9  |
| IPBZA4-12150/55 1) | 12              | 150           | 50                       | 4000   | 6.7               | 567.4  |
| IPBZA4-12180/85 1) | 12              | 180           | 50                       | 4000   | 7.8               | 651.3  |
| IPBZA4-16125/5 1)  | 16              | 125           | 25                       | 4000   | 5.3               | 879.1  |
| IPBZA4-16140/20 1) | 16              | 140           | 25                       | 4000   | 5.8               | 957.4  |
| IPBZA4-16150/30 1) | 16              | 150           | 25                       | 4000   | 6.1               | 1007.0 |
| IPBZA4-16180/60 1) | 16              | 180           | 25                       | 3000   | 7.2               | 888.7  |

CHANNEL PARTNER



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