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Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment)

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# European Technical Assessment

# ETA-20/0718

## DXTM, DXTMX 12, DLXTM and DXTM-SS

**Fasteners for use in concrete for redundant non-structural applications**

*Kotwy do wielopunktowych zamocowań niekonstrukcyjnych w betonie*

Europejska Organizacja ds. Oceny Technicznej

European Organisation for Technical Assessment

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# European Technical Assessment

# ETA-20/0718 of 26/08/2020

## General Part

| | |
|---|---|
| **Technical Assessment Body issuing the European Technical Assessment** | Instytut Techniki Budowlanej |
| **Trade name of the construction product** | DXTM, DXTMX 12, DLXTM and DXTM-SS |
| **Product family to which the construction product belongs** | Fasteners for use in concrete for redundant non-structural applications |
| **Manufacturer** | ICCONS Pty Ltd<br>Po BOX 4349<br>Dandenong South 3164<br>VIC, Australia |
| **Manufacturing plant(s)** | Manufacturing Plants no. 2 |
| **This European Technical Assessment contains** | 10 pages including 3 Annexes which form an integral part of this assessment |
| **This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of** | European Assessment Document (EAD) 330747-00-0601 "Fasteners for use in concrete for redundant non-structural systems" |

# Specific Part

## 1 Technical description of the product

The DXTM, DXTMX 12, DLXTM and DXTM-SS are deformation-controlled expansion anchors in sizes of M6, M8, M10, M12, M16 and M20. The anchors DXTM, DXTMX 12 and DLXTM are made of zinc plated steel and DXTM-SS are made of stainless steel.

The anchor is installed in a drilled hole and anchored by deformation-controlled expansion.

The description of the product is given in Annex A.

## 2 Specification of the intended use in accordance with the applicable European Assessment Document (EAD)

The performances given in Section 3 are only valid if the anchors are used in compliance with the specifications and conditions given in Annex B.

The performances given in this European Technical Assessment are based on an assumed working life of the anchor of 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer or the Technical Assessment Body, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

## 3 Performance of the product and references to the methods used for its assessment

### 3.1 Performance of the product

#### 3.1.1 Safety in case of fire (BWR 2)

| Essential characteristic | Performance |
|---|---|
| Reaction to fire | Class A1 |
| Resistance to fire | Annex C2 |

#### 3.1.2 Safety and accessibility in use (BWR 4)

| Essential characteristic | Performance |
|---|---|
| Characteristic resistance for all load directions | Annex C1 |
| Edge distance and spacing | Annex C1 |

### 3.2 Methods used for the assessment

The assessment of the products has been made in accordance with EAD 330747-00-0601.

## 4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

According to Decision 97/161/EC of the European Commission the system 2+ of assessment and verification of constancy of performance applies (see Annex V to Regulation (EU) No 305/2011).

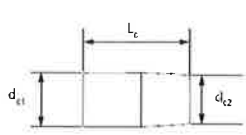
## 5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document (EAD)

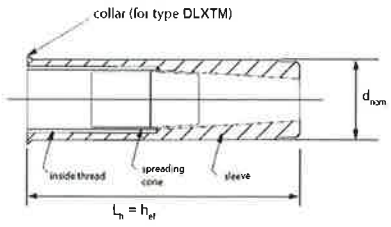
Technical details necessary for the implementation of the AVCP system are laid down in the control plan which is deposited at Instytut Techniki Budowlanej.

For type testing the results of the tests performed as part of the assessment for the European Technical Assessment shall be used unless there are changes in the production line or plant. In such cases the necessary type testing has to be agreed between Instytut Techniki Budowlanej and the notified body.

Issued in Warsaw on 26/08/2020 by Instytut Techniki Budowlanej

Anna Panek, MSc
Deputy Director of ITB



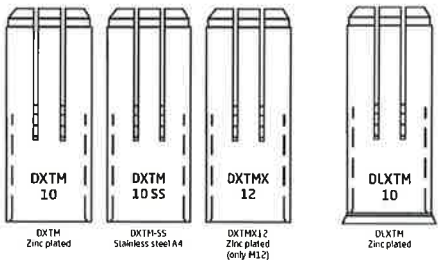




**Table A1.** Anchors DXTM, DLXTM, DXTMX 12 – materials and dimensions

| **Anchor type** | | **DXTM, DLXTM** | | | | | | | **DXTMX 12** |
|---|---|---|---|---|---|---|---|---|---|
| **Anchor size** | | **M6x25** | **M8x30** | **M10x30** | **M10x40*** | **M12x50** | **M16x65** | **M20x80** | **M12x50** |
| **Anchor length $L_H$** | **[mm]** | 25 | 30 | 30 | 40 | 50 | 65 | 80 | 50 |
| **Thread inside** | **[mm]** | 6 | 8 | 10 | 10 | 12 | 16 | 20 | 12 |
| **External diameter $d_{nom}$** | **[mm]** | 8 | 10 | 12 | 12 | 15 | 20 | 25 | 16 |
| **Anchor material** | cold forming steel C1008 or acc. to EN 10277; galvanized ≥ 5 µm acc. to EN ISO 4042<br>$f_{uk} \geq 450$ N/mm² and $f_{yk} \geq 360$ N/mm²<br>*cold forming steel C1015 or acc. to EN 10277; galvanized ≥ 5 µm acc. to EN ISO 4042<br>$f_{uk} \geq 450$ N/mm² and $f_{yk} \geq 360$ N/mm² | | | | | | | | |

**Table A2.** Anchor DXTM-SS – materials and dimensions

| **Anchor type** | | **DXTM-SS** | | | | | |
|---|---|---|---|---|---|---|---|
| **Anchor size** | | **M6x25** | **M8x30** | **M10x40** | **M12x50** | **M16x65** | **M20x80** |
| **Anchor length $L_H$** | **[mm]** | 25 | 30 | 40 | 50 | 65 | 80 |
| **Thread inside** | **[mm]** | 6 | 8 | 10 | 12 | 16 | 20 |
| **External diameter $d_{nom}$** | **[mm]** | 8 | 10 | 12 | 15 | 20 | 25 |
| **Anchor material** | stainless steel 1.4401 acc. to EN 10088 (AISI 316)<br>$f_{uk} \geq 500$ N/mm² and $f_{yk} \geq 210$ N/mm² | | | | | | |

**Table A3.** Expansion plug – materials and dimensions

| **Spreading cone** | | **M6** | **M8** | **M10** | **M12** | **M16** | **M20** |
|---|---|---|---|---|---|---|---|
| **Rear diameter $d_{c1}$** | **[mm]** | 5,0 | 6,4 | 8,0 | 10,0 | 13,5 | 16,8 |
| **Front diameter $d_{c2}$** | **[mm]** | 4,3 | 5,1 | 6,8 | 8,8 | 13,0 | 15,2 |
| **Length $l_c$** | **[mm]** | 9,8 | 11,4 | 16,0 | 20,8 | 29,2 | 30,0 |
| **Expansion plug material** | cold forming steel C1008; galvanized > 5 µm<br>or stainless steel 1.4401, 1.4404 acc. to EN 10088 | | | | | | |

| **DXTM, DLXTM, DXTMX 12 and DXTM-SS** | **Annex A1**<br>of European Technical Assessment ETA-20/0718 |
|---|---|
| **Product description**<br>Characteristic of the product | |

## Specification of intended use

**Anchorages subject to:**

- Multiple use for non-structural applications: sizes from M6 to M20.
- Static and quasi-static loads: sizes from M6 to M20.
- Anchorages with requirements related to resistance to fire: sizes from M8 to M20.

**Base material:**

- Reinforced or unreinforced, cracked or non-cracked normal weight concrete (without fibres) of strength classes C20/25 to C50/60 at maximum according to EN 206.

**Use conditions (environmental conditions):**

- All sizes (zinc coated steel) and size M6 (stainless steel): structures subject to dry internal conditions.
- Sizes from M8 to M20 (stainless steel): structures subject to dry internal conditions and also in concrete subject to external atmospheric exposure (including industrial and marine environment) or exposure in permanently damp internal conditions, if no particular aggressive conditions exist.

**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 transmitted. 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 under static and quasi-static loads and under fire exposure are designed in accordance with EN 1992-4:2018.

**Installation:**

- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Use of the anchor only as supplied by the manufacturer without exchanging any component of the anchor.
- Anchor installation in accordance with the manufacturer's specifications and drawings and using the appropriate tools.
- Check of concrete being well compacted, e.g. without significant voids.
- Positioning of the drill holes without damaging the reinforcement.
- In case of aborted hole: new drilling at a minimum distance away of twice the depth of the aborted hole or smaller distance if the aborted drill hole is filled with high strength mortar and if under shear or oblique tension load it is not in the direction of load application.
- Anchor installation such that the effective anchorage depth is complied with.
- Anchor expansion by impact on the cone (expansion plug) of the anchor.

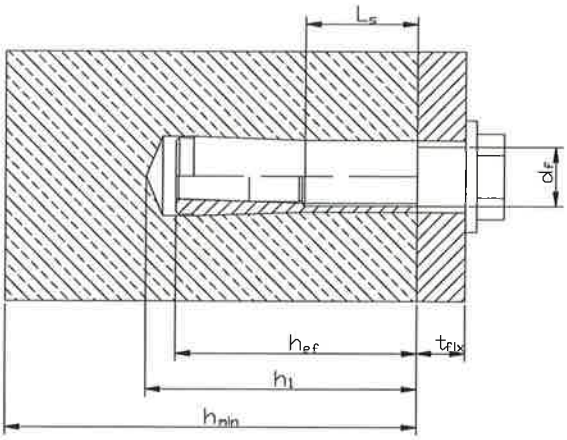



**Table B1:** Installation parameters of DXTM, DLXTM, DXTMX 12 and DXTM-SS

| Anchor size | Effective anchorage depth | Drill hole depth | Drill hole diameter | Installation torque moment (max) | Thickness of concrete member (min) | Screwing depth (min) | Screwing depth (max) | Diameter of clearance hole in the fixture |
|---|---|---|---|---|---|---|---|---|
| | [mm] | [mm] | [mm] | [Nm] | [mm] | [mm] | [mm] | [mm] |
| | $h_{ef}$ | $h_1$ | $d_0$ | max $T_{inst}$ | $h_{min}$ | $L_{s,\,min}$ | $L_{s,\,max}$ | $d_f$ |
| M6 | 25 | 27 | 8 | 4,5 | 80 | 6 | 11 | 7 |
| M8 | 30 | 33 | 10 | 11 | 80 | 8 | 13 | 9 |
| M10 | 30 | 33 | 12 | 22 | 80 | 8 | 13 | 12 |
| M10 | 40 | 43 | 12 | 22 | 80 | 10 | 15 | 12 |
| M12 | 50 | 54 | 15 | 38 | 100 | 12 | 20 | 14 |
| M12* | 50 | 54 | 16 | 38 | 100 | 12 | 20 | 14 |
| M16 | 65 | 70 | 20 | 98 | 130 | 16 | 25 | 18 |
| M20 | 80 | 86 | 25 | 130 | 160 | 20 | 35 | 22 |

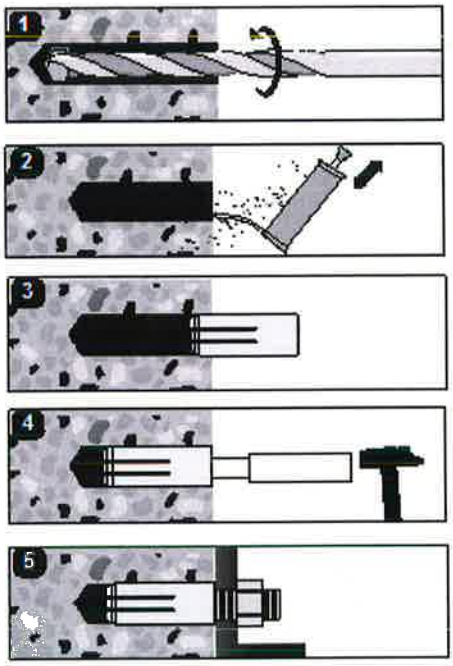
* DXTMX 12 only

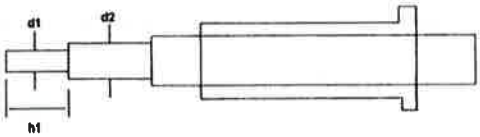
**Fastening screws or anchor threaded rods:**

Steel, property class ≥ 4.8 according to EN-ISO 898-1; galvanized ≥ 5 µm (DXTM, DXTMX 12, DLXTM)

Stainless steel 1.4401 according to EN 10088, property class ≥ 70 according to EN ISO 3506 (DXTM-SS)

| | |
|---|---|
| **DXTM, DLXTM, DXTMX 12 and DXTM-SS** | **Annex B2** of European Technical Assessment ETA-20/0718 |
| **Intended use** Installation parameters | |



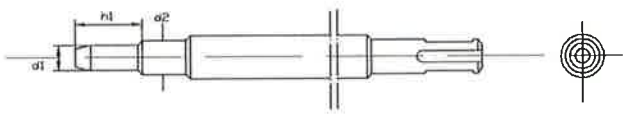




**Table B2:** Installation tools

| Size | d1 | d2 | h1 |
|---|---|---|---|
| **M6** | 5,0 | 7,5 | 15,0 |
| **M8** | 6,5 | 9,5 | 18,0 |
| **M10 x 30** | 8,0 | 11,5 | 18,0 |
| **M10 x 40** | 8,0 | 11,5 | 24,0 |
| **M12** | 10,2 | 14,5 | 30,0 |
| **M16** | 13,5 | 18,0 | 36,0 |
| **M20** | 16,5 | 22,0 | 50,0 |

| | |
|---|---|
| **DXTM, DLXTM, DXTMX 12 and DXTM-SS** | **Annex B3**<br>of European Technical Assessment ETA-20/0718 |
| **Intended use**<br>Installation instruction | |

**Table C1:** Characteristic resistance – DXTM, DLXTM, DXTMX 12

| **Anchor type:** | | | **Property class** | **DXTM and DLXTM** | | | | | | | **DXTMX 12** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **6x26** | **8x30** | **10x30** | **10x40** | **12x50** | **16x65** | **20x80** | **12x50** |
| **All load directions (fastening screw or threaded rod property class ≥ 4.8)** | | | | | | | | | | | |
| Characteristic resistance in concrete C20/25 to C50/60 | $F^0_{Rk}$ | [kN] | ≥ 4.8 | **1,56** | **2,87** | **4,79** | **5,75** | **5,87** | **12,59** | **15,43** | **6,33** |
| Partial safety factor | $\gamma_2$ | [-] | - | **1,4** | | | | | | | |
| Characteristic spacing | $s_{cr}$ | [mm] | | **200** | | | | | **260** | **320** | **200** |
| Characteristic edge distance | $c_{cr}$ | [mm] | | **150** | | | | | **195** | **240** | **150** |
| **Shear load: steel failure with lever arm** | | | | | | | | | | | |
| Characteristic bending moment | $M^0_{Rk,S}$ | [Nm] | 4.8 | **6** | **15** | **30** | **30** | **52** | **133** | **260** | **52** |
| Characteristic bending moment | $M^0_{Rk,S}$ | [Nm] | 5.8 | **8** | **19** | **37** | **37** | **66** | **167** | **325** | **66** |
| Characteristic bending moment | $M^0_{Rk,S}$ | [Nm] | 6.8 | **9** | **23** | **45** | **45** | **79** | **200** | **390** | **79** |
| Characteristic bending moment | $M^0_{Rk,S}$ | [Nm] | 8.8 | **12** | **30** | **60** | **60** | **105** | **267** | **520** | **105** |

**Table C2:** Characteristic resistance – DXTM-SS

| **DXTM-SS** | | | **Property class** | **6x26** | **8x30** | **10x40** | **12x50** | **16x65** | **20x80** |
|---|---|---|---|---|---|---|---|---|---|
| **All load directions (fastening screw or threaded rod property class A4-70)** | | | | | | | | | |
| Characteristic resistance in concrete C20/25 to C50/60 | $F^0_{Rk}$ | [kN] | A4-70 | **0,84** | **1,59** | **2,58** | **4,02** | **9,05** | **12,26** |
| Partial safety factor | $\gamma_2$ | [-] | - | **1,4** | | | | | |
| Characteristic spacing | $s_{cr}$ | [mm] | | **200** | | | | **260** | **320** |
| Characteristic edge distance | $c_{cr}$ | [mm] | | **150** | | | | **195** | **240** |
| **Shear load: steel failure with lever arm** | | | | | | | | | |
| Characteristic bending moment | $M^0_{Rk,S}$ | [Nm] | A4-70 | **11** | **26** | **52** | **92** | **233** | **454** |

**Table C3:** Characteristic resistance under fire exposure in concrete C20/25 to C50/60 – DXTM, DLXTM and DXTMX 12

| **Fire resistance class** | **DXTM, DLXTM and DXTMX 12** | | **M8** | **M10** | **M12** | **M16** | **M20** |
|---|---|---|---|---|---|---|---|
| **All load directions (fastening screw or threaded rod property class ≥ 4.8)** | | | | | | | |
| R30 | Characteristic resistance $F_{Rk,fi}$[1] | [kN] | **0,4** | **0,9** | **1,5** | **3,1** | **3,9** |
| R60 | | [kN] | **0,3** | **0,8** | **1,3** | **2,4** | **3,7** |
| R90 | | [kN] | **0,3** | **0,6** | **1,1** | **2,0** | **3,2** |
| R120 | | [kN] | **0,2** | **0,5** | **0,8** | **1,6** | **2,5** |
| Spacing | $s_{cr,fi}$ | [mm] | **4 x $h_{ef}$** | | | | |
| Edge distance | $c_{cr,fi}$ | [mm] | **2 x $h_{ef}$** | | | | |
| In case of fire attack from more than one side, the edge distance shall be ≥ 300 mm. | | | | | | | |

(1) in the absence of other national regulations a partial safety factor $\gamma_{m,fi} = 1,0$ is recommended

**Table C4:** Characteristic resistance under fire exposure in concrete C20/25 to C50/60 – DXTM-SS

| **Fire resistance class** | **DXTM-SS** | | **M8** | **M10** | **M12** | **M16** | **M20** |
|---|---|---|---|---|---|---|---|
| **All load directions (fastening screw or threaded rod property class ≥ A4-70)** | | | | | | | |
| R30 | Characteristic resistance $F_{Rk,fi}$[1] | [kN] | **0,4** | **0,6** | **1,0** | **2,3** | **3,1** |
| R60 | | [kN] | **0,4** | **0,6** | **1,0** | **2,3** | **3,1** |
| R90 | | [kN] | **0,4** | **0,6** | **1,0** | **2,3** | **3,1** |
| R120 | | [kN] | **0,3** | **0,5** | **0,8** | **1,8** | **2,5** |
| Spacing | $s_{cr,fi}$ | [mm] | **4 x $h_{ef}$** | | | | |
| Edge distance | $c_{cr,fi}$ | [mm] | **2 x $h_{ef}$** | | | | |
| In case of fire attack from more than one side, the edge distance shall be ≥ 300 mm. | | | | | | | |

(1) in the absence of other national regulations a partial safety factor $\gamma_{m,fi} = 1,0$ is recommended