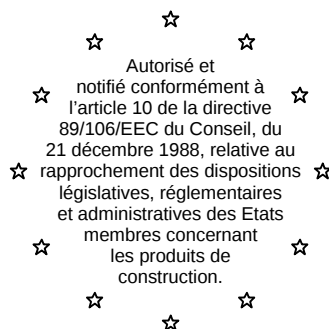


# Centre Scientifique et Technique du Bâtiment

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## European Technical Approval

## ETA-09/0011

(English language translation, the original version is in French language)

Nom commercial :

**Trade name:**

Titulaire :

**Holder of approval:**

Type générique et utilisation prévue du  
produit de construction :

**Generic type and use of  
construction product:**

Validité du :  
au :

**Validity from / to:**

Usine de fabrication :

**Manufacturing plant:**

**Powers ceiling anchor PBZ-PRO**

Powers Fasteners Europe BV  
Westrak 208  
1771 SV Wieringerwerf  
The Netherlands

Cheville métallique électrozinguée, pour usage multiple et pour  
applications non structurales dans du béton.

**Anchor made of galvanised steel, for multiple use for non  
structural application in concrete**

**12/05/2009  
04/02/2014**

**Plant 1  
Plant 2**

Le présent Agrément technique européen  
contient :

**This European Technical Approval  
contains:**

12 pages incluant 4 annexes faisant partie intégrante du document.

**12 pages including 4 annexes which form an integral part of  
the document.**

This European Technical Approval replaces ETA-09/0011 with validity from 04/02/2009 to 04/02/2014

Cet Agrément Technique Européen remplace l'Agrément ETA-09/0011 valide du 04/02/2009 au 04/02/2014



Organisation pour l'Agrément Technique Européen  
European Organisation for Technical Approvals

## **I LEGAL BASES AND GENERAL CONDITIONS**

1. This European Technical Approval is issued by the Centre Scientifique et Technique du Bâtiment in accordance with:
  - Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products<sup>1</sup>, modified by the Council Directive 93/68/EEC of 22 July 1993<sup>2</sup>;
  - Décret n°92-647 du 8 juillet 1992<sup>3</sup> concernant l'aptitude à l'usage des produits de construction;
  - Common Procedural Rules for Requesting, Preparing and the Granting of European Technical Approvals set out in the Annex of Commission Decision 94/23/EC<sup>4</sup>;
  - Guideline for European Technical Approval of « Metal Anchors for use in Concrete » ETAG 001, edition 1997, Part 1 « Anchors in general » and Part 6 « Anchors for multiple use for non structural applications».
2. The Centre Scientifique et Technique du Bâtiment is authorised to check whether the provisions of this European Technical Approval are met. Checking may take place in the manufacturing plant (for example concerning the fulfilment of assumptions made in this European Technical Approval with regard to manufacturing). Nevertheless, the responsibility for the conformity of the products with the European Technical Approval and for their fitness for the intended use remains with the holder of the European Technical Approval.
3. This European Technical Approval is not to be transferred to manufacturers or agents of manufacturer other than those indicated on page 1; or manufacturing plants other than those indicated on page 1 of this European Technical Approval.
4. This European Technical Approval may be withdrawn by the Centre Scientifique et Technique du Bâtiment pursuant to Article 5 (1) of the Council Directive 89/106/EEC.
5. Reproduction of this European Technical Approval including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of the Centre Scientifique et Technique du Bâtiment. In this case partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the European Technical Approval.
6. The European Technical Approval is issued by the approval body in its official language. This version corresponds to the version circulated within EOTA. Translations into other languages have to be designated as such.

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<sup>1</sup> Official Journal of the European Communities n° L 40, 11.2.1989, p. 12

<sup>2</sup> Official Journal of the European Communities n° L 220, 30.8.1993, p. 1

<sup>3</sup> Journal officiel de la République française du 14 juillet 1992

<sup>4</sup> Official Journal of the European Communities n° L 17, 20.1.1994, p. 34

## **II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL**

### **1 Definition of product and intended use**

#### **1.1. Definition of product**

The Powers Wedge nail PBZ-PRO anchor is an anchor made of zinc electroplated steel, which is placed into a drilled hole and anchored by deformation-controlled expansion.  
For the installed anchor see Figure given in Annex 1.

#### **1.2. Intended use**

The anchor is intended to be used for anchorages for which requirements for safety in use in the sense of the Essential Requirements 4 of Council Directive 89/106/EEC shall be fulfilled and failure of the fixture represent an immediate risk to human life.

The anchor is to be used only for multiple use for non-structural applications. The definition of multiple use according to the member States is given in the informative Annex 1 of ETAG 001, Part 6.

The anchor may be used for anchorages with requirements related to resistance to fire.

The anchor is to be used only for anchorages subject to static or quasi-static loading in reinforced or unreinforced normal weight concrete of strength classes C20/25 minimum to C50/60 maximum according to ENV 206-1: 2000-12. It may be anchored in cracked or non-cracked concrete.

The anchor may only be used in structures subject to dry internal conditions.

The provisions made in this European Technical Approval are based on an assumed intended 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, 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.

### **2 Characteristics of product and methods of verification**

#### **2.1. Characteristics of product**

The Powers Wedge nail PBZ-PRO anchor corresponds to the drawings and provisions given in Annexes 1 to 2. The characteristic material values, dimensions and tolerances of the anchor not indicated in Annexe 2 shall correspond to the respective values laid down in the technical documentation<sup>5</sup> of this European Technical Approval.

Regarding the requirement concerning safety in case of fire it is assumed that the anchor meets the requirements of class A1 in relation to reaction to fire in accordance with the stipulations of the commission decision 96/603/EC, amended by 2000/605/EC.

<sup>5</sup>

The technical documentation of this European Technical Approval is deposited at the Centre Scientifique et Technique du Bâtiment and, as far as relevant for the tasks of the approved bodies involved in the attestation of conformity procedure, is handed over to the approved bodies.

The characteristic values for the design of anchorages are given in Annexes 2 and 3. The characteristic values for the design of anchorages regarding resistance to fire are given in Annexe 4. They are valid for use in a system that is required to provide a specific fire resistance class.

Each anchor is marked with the identifying mark of the producer according to Annex 2.

The anchor shall only be packaged and supplied as a complete unit.

## **2.2. Methods of verification**

The assessment of fitness of the anchor for the intended use in relation to the requirements for safety in use in the sense of the Essential Requirements 4 has been made in accordance with the « Guideline for European Technical Approval of Metal Anchors for use in Concrete », Part 1 « Anchors in general » and Part 6 « Anchors for multiple use for non-structural applications »,.

The assessment of the anchor for the intended use in relation to the requirements for resistance to fire has been made in accordance with the Technical Report TR 020 "Evaluation of anchorages in concrete concerning resistance to fire".

In addition to the specific clauses relating to dangerous substances contained in this European technical approval, there may be other requirements applicable for the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Product Directive, these requirements need also to be complied with, when and where they apply.

## **3 Evaluation of Conformity and CE marking**

### **3.1. Attestation of conformity system**

The system of attestation of conformity 2 (ii) (referred to as system 2+) according to Council Directive 97/161/EG laid down by the European Commission provides:

a) tasks for the manufacturer:

1. initial type-testing of the product,
2. factory production control,
3. further testing of samples taken at the factory by the manufacturer in accordance with a prescribed test plan.

b) tasks for the approved body:

4. initial inspection of factory and of factory production control,
5. continuous surveillance, assessment and approval of factory production control.

## 3.2. Responsibilities

### 3.2.1. Tasks of the manufacturer

#### 3.2.1.1 Factory production control

The manufacturer has a factory production control system in the plant and exercises permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer are documented in a systematic manner in the form of written policies and procedures. This production control system ensures that the product is in conformity with this European Technical Approval.

The manufacturer shall only use raw materials supplied with the relevant inspection documents as laid down in the prescribed test plan<sup>6</sup>. The incoming raw materials shall be subject to controls and tests by the manufacturer before acceptance. Check of incoming materials shall include control of the inspection documents presented by suppliers (comparison with nominal values) by verifying dimension and determining material properties, e.g. tensile strength, hardness, surface finish.

The results of factory production control are recorded and evaluated in accordance with the prescribed test plan.

The records shall be presented to the inspection body during the continuous surveillance. On request, they shall be presented to the Centre Scientifique et Technique du Bâtiment.

Details of the extent, nature and frequency of testing and controls to be performed within the factory production control shall correspond to the prescribed test plan which is part of the technical documentation of this European Technical Approval.

#### 3.2.1.2 Other tasks of the manufacturer

The manufacturer shall, on the basis of a contract, involve a body which is approved for the tasks referred to in section 3.1 in the field of anchors in order to undertake the actions laid down in section 3.2.2. For this purpose, the control plan referred to in section 3.2.1.1 and 3.2.2 shall be handed over by the manufacturer to the approved body involved.

The manufacturer shall make a declaration of conformity, stating that the construction product is in conformity with the provisions of this European technical approval.

### 3.2.2. Tasks of approved bodies

#### 3.2.2.1. Initial inspection of factory and of factory production control

The approved body shall ascertain that, in accordance with the prescribed test plan, the factory and the factory production control are suitable to ensure continuous and orderly manufacturing of the anchor according to the specifications mentioned in 2.1. as well as to the Annexes to the European Technical Approval.

The approved certification body involved by the manufacturer shall issue an EC certificate of conformity of the product stating the conformity with the provisions of this European technical

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<sup>6</sup> The prescribed test plan has been deposited at the Centre Scientifique et Technique du Bâtiment and is handed over only to the approved bodies involved in the conformity attestation procedure.

approval. In cases where the provisions of the European technical approval and its control plan are no longer fulfilled the certification body shall withdraw the certificate of conformity and inform CSTB without delay.

#### 3.2.2.2. Continuous surveillance

The approved body shall visit the factory at least once a year for routine inspection. It has to be verified that the system of factory production control and the specified automated manufacturing process are maintained taking account of the prescribed test plan.

Continuous surveillance and assessment of factory production control have to be performed according to the prescribed test plan.

The results of product certification and continuous surveillance shall be made available on demand by the certification body or inspection body, respectively, to the Centre Scientifique et Technique du Bâtiment. In cases where the provisions of the European Technical Approval and the prescribed test plan are no longer fulfilled the conformity certificate shall be withdrawn.

### 3.3. CE-Marking

The CE marking shall be affixed on each packaging of anchors. The symbol « CE » shall be accompanied by the following information:

- identification number of the certification body;
- name or identifying mark of the producer and manufacturing plant;
- the last two digits of the year in which the CE-marking was affixed;
- number of the EC certificate of conformity;
- number of the European Technical Approval;
- use category (ETAG 001-6);
- size.

## 4 Assumptions under which the fitness of the product for the intended use was favourably assessed

### 4.1. Manufacturing

The anchor is manufactured in accordance with the provisions of the European Technical Approval using the automated manufacturing process as identified during inspection of the plant by the Centre Scientifique et Technique du Bâtiment and the approved body and laid down in the technical documentation. Changes to the product or production process, which could result in the deposited data/information being incorrect, should be notified to the CSTB before the changes are introduced. CSTB will decide whether or not such changes affect the approval and consequently the validity of the CE marking on the basis of the approval and if so whether further assessment or alterations to the approval shall be necessary.

### 4.2. Installation

#### 4.2.1. Design of anchorages

The fitness of the anchors for the intended use is given under the following conditions:

The anchorages are designed in accordance with the « Guideline for European Technical Approval of Metal Anchors for Use in Concrete », Annex C, Method B or C, under the responsibility of an engineer experienced in anchorages and concrete work.

The anchor is to be used only for multiple use for non structural applications, the definition of multiple use according to the member states is given in the informative Annex 1 of ETAG 001 part 6.

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 support, etc.).

The design of the fixture is such that in case of excessive slip or failure of one anchor the load can be transmitted to neighbouring anchors.

The design of anchorages under fire exposure has to consider the conditions given in the Technical Report TR 020 "Evaluation of anchorages in concrete concerning resistance to fire". The relevant characteristics values are given in Annex 4, Table 5. The design method covers anchors with fire attack from one side only. If the fire attack is from more than one side, the design method may be taken only if the edge distance of the anchor is  $c \geq 300$  mm.

#### 4.2.2. Installation of anchors

The fitness for use of the anchor can only be assumed if the anchor is installed as follows:

- anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters on the site;
- use of the anchor only as supplied by the manufacturer without exchanging the components of an anchor;
- anchor installation in accordance with the manufacturer's specifications and drawings prepared for that purpose and using the appropriate tools;
- checks before placing the anchor to ensure that the strength class of the concrete in which the anchor is to be placed is in the range given and is not lower than that of the concrete to which the characteristic loads apply;
- check of concrete being well compacted, e.g. without significant voids;
- clearing the hole of drilling dust;
- Anchor installation such that the effective anchorage depth is complied with. This compliance is ensured, if the thickness of fixture is not greater than the maximum thickness of fixture given in this ETA;
- keeping of the edge distance and spacing to the specified values without minus tolerances;
- 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 to the anchor in the direction of load application;

#### 4.2.3. Responsibility of the manufacturer

It is the manufacturer's responsibility to ensure that the information on the specific conditions according to 1 and 2 including Annexes referred to in 4.2.1. and 4.2.2. is given to those who are concerned. This information may be made by reproduction of the respective parts of the

European Technical Approval. In addition all installation data shall be shown clearly on the package and/or on an enclosed instruction sheet, preferably using illustration(s).

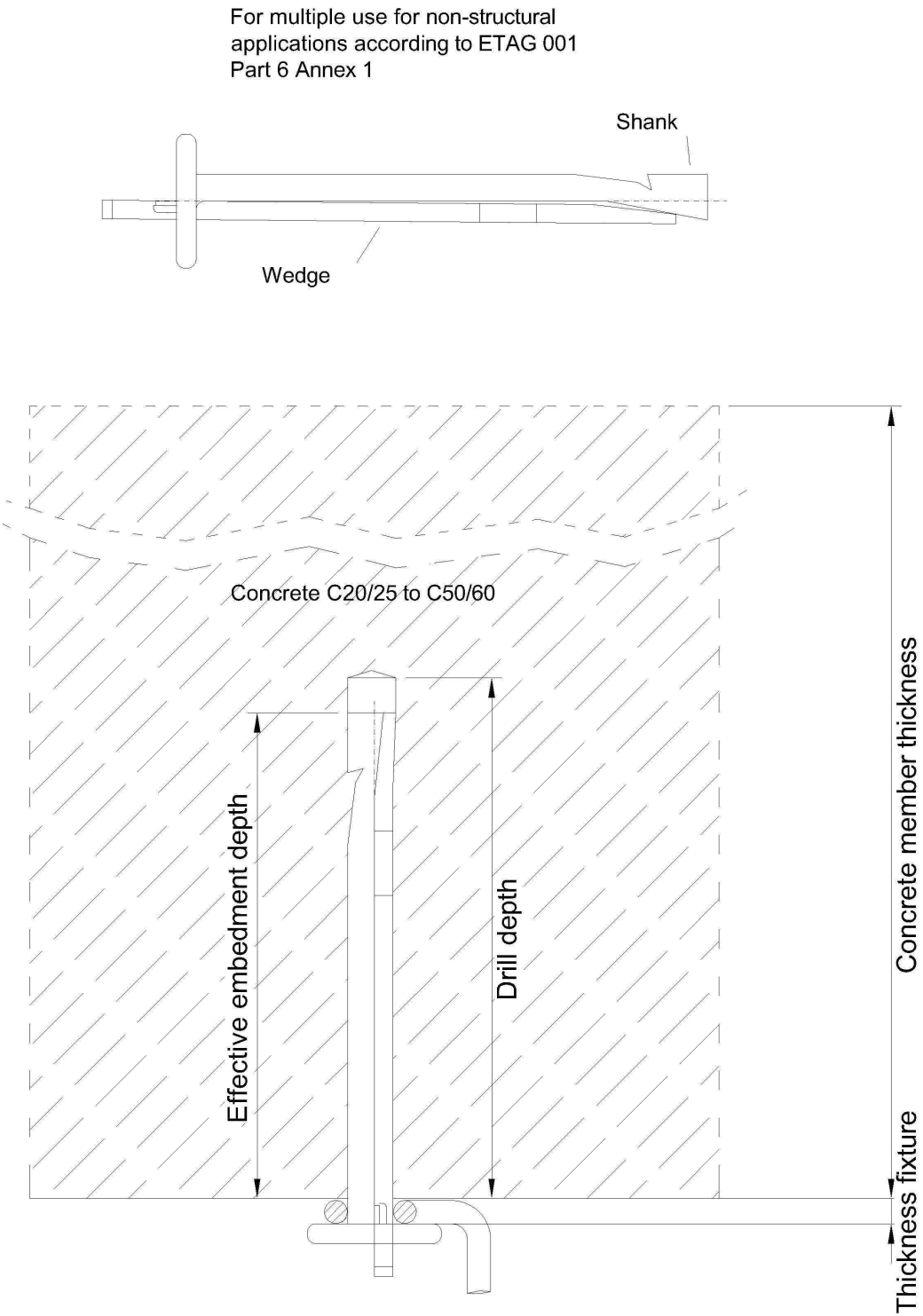
The minimum data required are:

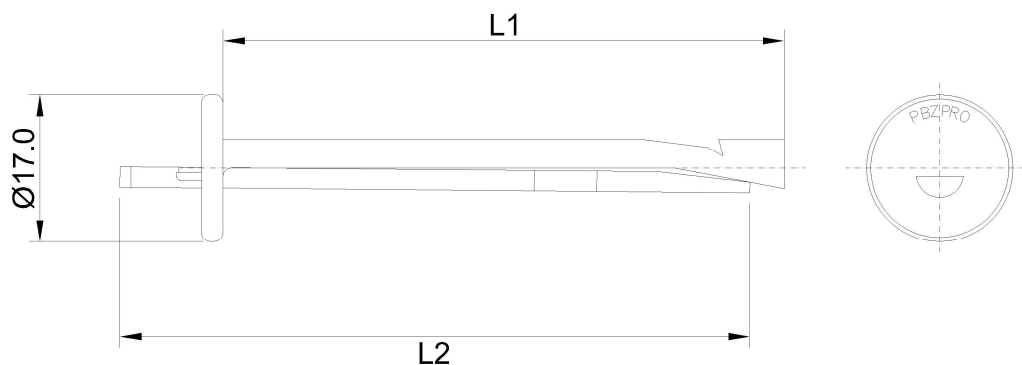
- drill bit diameter,
- maximum thickness of the fixture,
- minimum embedment depth,
- minimum hole depth,
- information on the installation procedure, including cleaning of the hole, preferably by means of an illustration,
- reference to any special installation equipment needed,
- identification of the manufacturing batch.

All data shall be presented in a clear and explicit form.

**The original French version is signed by**

**Le Directeur Technique  
H.BERRIER**

|                                                                                                                                                                                  |                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| <p>For multiple use for non-structural applications according to ETAG 001 Part 6 Annex 1</p>  |                                                              |
| POWERS Ceiling Anchor PBZ-PRO                                                                                                                                                    | Annex 1<br><br>of European Technical Approval<br>ETA-09/0011 |
| Product and intended use                                                                                                                                                         |                                                              |



**Table 1:** Dimensions and materials

| Powers Ceiling Anchor PBZ-PRO |                         | 6 - 5/40 | 6 - 35/70 |
|-------------------------------|-------------------------|----------|-----------|
| Length of wedge L2            | [mm]                    | 43       | 73        |
| Length of shank L1            | [mm]                    | 35       | 65        |
| Material wedge                | Steel acc. to AISI 1045 |          |           |
| Material shank                | Steel acc. to AISI 1008 |          |           |

**Table 2:** Installation parameters

| Powers Ceiling Anchor PBZ-PRO |            |      | 6 - 5/40 | 6 - 35/70 |
|-------------------------------|------------|------|----------|-----------|
| Diameter of drill hole        | $d_0$      | [mm] | 6        | 6         |
| Depth of drill hole           | $h_0 \geq$ | [mm] | 40       | 40        |
| Effective anchorage depth     | $h_{ef}$   | [mm] | 30       | 30        |
| Minimum thickness of member   | $h_{min}$  | [mm] | 80       | 80        |
| Max. thickness of fixture     | $t_{fix}$  | [mm] | 5        | 35        |
| <b>Design method B</b>        |            |      |          |           |
| Minimum spacing               | $s_{min}$  | [mm] | 90       | 90        |
| Minimum edge distance         | $c_{min}$  | [mm] | 200      | 200       |
| <b>Design method C</b>        |            |      |          |           |
| Minimum spacing               | $s_{min}$  | [mm] | 200      | 200       |
| Minimum edge distance         | $c_{min}$  | [mm] | 150      | 150       |

POWERS Ceiling Anchor PBZ-PRO

Dimension - Materials - Installation data

Annex 2

of European Technical  
Approval  
ETA-09/0011

**Table 3: Design method B:** Characteristic resistances, safety factors and design values

| <b>Powers Ceiling Anchor PBZ-PRO</b>                                           |                    |      |                   |                  |
|--------------------------------------------------------------------------------|--------------------|------|-------------------|------------------|
| <b>Tension and shear</b>                                                       |                    |      | <b>6 - 4,5/40</b> | <b>6 - 35/70</b> |
| Char. resistance (C20/25 to C50/60)                                            | $F_{Rk}$           | [kN] | 3,0               | 3,0              |
| Partial safety factor (including installation safety factor $\gamma_2 = 1,0$ ) | $\gamma_M^{1)}$    | [-]  | 1,5               | 1,5              |
| Design value of resistance                                                     | $F_{Rd}$           | [kN] | 2,0               | 2,0              |
| Char. spacing (design method B)                                                | $s_{cr}$           | [mm] | 200               | 200              |
| Char. edge distance (design method B)                                          | $c_{cr}$           | [mm] | 200               | 200              |
| <b>Shear load with lever arm</b>                                               |                    |      |                   |                  |
| Characteristic bending moment                                                  | $M_{Rk,s}^{0\ 2)}$ | [Nm] | 6,1               | 6,1              |
| Partial safety factor                                                          | $\gamma_M^{1)}$    | [-]  | 1,25              | 1,25             |
| Design value                                                                   | $M_{Rd,s}^0$       | [Nm] | 4,88              | 4,88             |

1) In absence of other national regulations

2) Characteristic bending resistance see ETAG 001, Annex C, Section 5.2.3.2 b)

**Table 4: Design method C:** Characteristic resistances, safety factors and design values

| <b>Powers Ceiling Anchor PBZ-PRO</b>                                           |                    |      |                   |                  |
|--------------------------------------------------------------------------------|--------------------|------|-------------------|------------------|
| <b>Tension and shear</b>                                                       |                    |      | <b>6 - 4,5/40</b> | <b>6 - 35/70</b> |
| Char. resistance (C20/25 to C50/60)                                            | $F_{Rk}$           | [kN] | 3,0               | 3,0              |
| Partial safety factor (including installation safety factor $\gamma_2 = 1,0$ ) | $\gamma_M^{1)}$    | [-]  | 1,5               | 1,5              |
| Design value of resistance                                                     | $F_{Rd}$           | [kN] | 2,0               | 2,0              |
| Char. spacing (design method C)                                                | $s_{cr}$           | [mm] | 200               | 200              |
| Char. edge distance (design method C)                                          | $c_{cr}$           | [mm] | 150               | 150              |
| <b>Shear load with lever arm</b>                                               |                    |      |                   |                  |
| Characteristic bending moment                                                  | $M_{Rk,s}^{0\ 2)}$ | [Nm] | 6,1               | 6,1              |
| Partial safety factor                                                          | $\gamma_M^{1)}$    | [-]  | 1,25              | 1,25             |
| Design value                                                                   | $M_{Rd,s}^0$       | [Nm] | 4,88              | 4,88             |

1) In absence of other national regulations

2) Characteristic bending resistance see ETAG 001, Annex C, Section 5.2.3.2 b)

**The anchor is to be used only for multiple use for non-structural applications, the definition of multiple use according to the Member States is given in the informative Annex 1 of ETAG 001, Part 6.**

|                                              |                                                             |
|----------------------------------------------|-------------------------------------------------------------|
| POWERS Ceiling Anchor PBZ-PRO                | Annex 3<br>of European Technical<br>Approval<br>ETA-09/0011 |
| Design method B and C, characteristic values |                                                             |

**Table 5:** Characteristic values under fire exposure in concrete C20/25 to C50/60 in any load direction without lever arm, Design method B and C

| Fire resistance class                   | Powers Ceiling Anchor PBZ-PRO                       |      | 6 - 4,5/40 | 6 - 35/70 |
|-----------------------------------------|-----------------------------------------------------|------|------------|-----------|
| Tension and shear <sup>1)</sup>         |                                                     |      |            |           |
| R 30                                    | Characteristic resistance $F_{Rk,fi}$ <sup>2)</sup> | [kN] | 0,80       | 0,80      |
| R 60                                    | Characteristic resistance $F_{Rk,fi}$ <sup>2)</sup> | [kN] | 0,63       | 0,63      |
| R 90                                    | Characteristic resistance $F_{Rk,fi}$ <sup>2)</sup> | [kN] | 0,38       | 0,38      |
| R 120                                   | Characteristic resistance $F_{Rk,fi}$ <sup>2)</sup> | [kN] | 0,25       | 0,25      |
| Shear load with lever arm <sup>1)</sup> |                                                     |      |            |           |
| R 30                                    | Char. bending resistance $M_{Rk,fi}$ <sup>2)</sup>  | [Nm] | 0,79       | 0,79      |
| R 60                                    | Char. bending resistance $M_{Rk,fi}$ <sup>2)</sup>  | [Nm] | 0,56       | 0,56      |
| R 90                                    | Char. bending resistance $M_{Rk,fi}$ <sup>2)</sup>  | [Nm] | 0,34       | 0,34      |
| R 120                                   | Char. bending resistance $M_{Rk,fi}$ <sup>2)</sup>  | [Nm] | 0,23       | 0,23      |

- 1) In case of fire attack from more than one side, the edge distance shall be  $\geq 300\text{mm}$   
2) In absence of other national regulations the partial safety factor for resistance under fire exposure.  $\gamma_{M,fi} = 1,0$  is recommended

POWERS Ceiling Anchor PBZ-PRO

Design method B and C, characteristic values for fire exposure

Annex 4

of European Technical  
Approval  
ETA-09/0011