



## European Technical Approval ETA-08/0190

English translation prepared by DIBt - Original version in German language

Handelsbezeichnung <i>Trade name</i>	Würth Kunststoff-Rahmendübel W-UR <i>Würth Plastic Anchor W-UR</i>
Zulassungsinhaber <i>Holder of approval</i>	Adolf Würth GmbH & Co. KG Reinhold-Würth-Straße 12-17 74653 Künzelsau DEUTSCHLAND
Zulassungsgegenstand und Verwendungszweck <i>Generic type and use of construction product</i>	Kunststoffdübel als Mehrfachbefestigung von nichttragenden Systemen zur Verankerung im Beton und Mauerwerk <i>Plastic anchor for multiple use in concrete and masonry for non-structural applications</i>
Geltungsdauer: <i>Validity:</i>	vom <i>from</i> 6 January 2011 bis <i>to</i> 1 December 2013
Herstellwerk <i>Manufacturing plant</i>	Werk 2

Diese Zulassung umfasst  
*This Approval contains*

78 Seiten einschließlich 66 Anhänge  
*78 pages including 66 annexes*

Diese Zulassung ersetzt  
*This Approval replaces*

ETA-08/0190 mit Geltungsdauer vom 15.05.2009 bis 01.12.2013  
*ETA-08/0190 with validity from 15.05.2009 to 01.12.2013*

## I LEGAL BASES AND GENERAL CONDITIONS

- 1 This European technical approval is issued by Deutsches Institut für Bautechnik 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 Council Directive 93/68/EEC<sup>2</sup> and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council<sup>3</sup>;
  - Gesetz über das In-Verkehr-Bringen von und den freien Warenverkehr mit Bauprodukten zur Umsetzung der Richtlinie 89/106/EWG des Rates vom 21. Dezember 1988 zur Angleichung der Rechts- und Verwaltungsvorschriften der Mitgliedstaaten über Bauprodukte und anderer Rechtsakte der Europäischen Gemeinschaften (Bauproduktengesetz - BauPG) vom 28. April 1998<sup>4</sup>, as amended by law of 31 October 2006<sup>5</sup>;
  - Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex to Commission Decision 94/23/EC<sup>6</sup>;
  - Guideline for European technical approval of "Plastic Anchors for Multiple Use in Concrete and Masonry for Non-structural Applications - Part 1: General", ETAG 020-01.
- 2 Deutsches Institut für Bautechnik is authorized to check whether the provisions of this European technical approval are met. Checking may take place in the manufacturing plant. Nevertheless, the responsibility for the conformity of the products to 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 manufacturers 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 Deutsches Institut für Bautechnik, in particular pursuant to information by the Commission according to Article 5(1) of Council Directive 89/106/EEC.
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- 6 The European technical approval is issued by the approval body in its official language. This version corresponds fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

<sup>1</sup> Official Journal of the European Communities L 40, 11 February 1989, p. 12  
<sup>2</sup> Official Journal of the European Communities L 220, 30 August 1993, p. 1  
<sup>3</sup> Official Journal of the European Union L 284, 31 October 2003, p. 25  
<sup>4</sup> *Bundesgesetzblatt Teil I 1998*, p. 812  
<sup>5</sup> *Bundesgesetzblatt Teil I 2006*, p. 2407, 2416  
<sup>6</sup> Official Journal of the European Communities L 17, 20 January 1994, p. 34

## II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

### 1 Definition of product and intended use

#### 1.1 Definition of the construction product

The Würth Plastic Anchor in the range W-UR 8 and W-UR 10 is a plastic anchor consisting of a plastic sleeve made of polyamide and an accompanying specific screw of galvanised steel or of stainless steel.

The plastic sleeve is expanded by screwing in the specific screw which presses the sleeve against the wall of the drilled hole.

The installed anchor is shown in Annex 1 and 2.

#### 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 Requirement 4 of Council Directive 89/106/EEC shall be fulfilled and failure of the fixture represents an immediate risk to human life.

The anchor is to be used only for multiple fixing for non-structural applications in concrete and masonry. The base material shall consist of reinforced or unreinforced normal weight concrete of strength class C12/15 at minimum according to EN 206-1:2000-12.

The anchor may be used in cracked and non-cracked concrete.

The anchor may also be used in concrete with requirements related to resistance to fire according 4.2.2.

The base material may also consist of masonry walls according to Annex 6 to 11, of non-cracked autoclaved aerated concrete (AAC blocks) according to Annex 61 and of (prefabricated) reinforced components of autoclaved aerated concrete (AAC) according to Annex 62.

The mortar strength class of the masonry has to be M 2,5 according to EN 998-2:2003 at minimum.

The specific screw made of galvanised steel may only be used in structures subject to dry internal conditions.

The specific screw made of stainless steel may be used in structures subject to dry internal conditions and also in structures subject to external atmospheric exposure (including industrial and marine environment), or exposure in permanently damp internal conditions, if no particular aggressive conditions exist. Such 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).

The specific screw made of galvanised steel with exception of the stair bolt according Annex 4 may also be used in structures subject to external atmospheric exposure, if the area of the head of the screw is protected against moisture and driving rain after mounting of the fixing unit in this way, that intrusion of moisture into the anchor shaft is prevented. Therefore there shall be an external cladding or a ventilated rainscreen mounted in front of the head of the screw and the head of the screw itself shall be coated with a soft plastic, permanently elastic bitumen-oil-combination coating (e. g. undercoating or body cavity protection for cars).

The anchor may be used in the following temperature range:

Temperature range b): -40 °C to +80 °C (max long term temperature +50 °C and max short term temperature +80 °C)

Temperature range c): -40 °C to +50 °C (max long term temperature +30 °C and max short term temperature +50 °C)

The provisions made in this European Technical Approval 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, 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 the product and methods of verification

### 2.1 Characteristics of the product

The anchor corresponds to the drawings and information given in Annex 3, 4 and 5. The characteristic material values, dimensions and tolerances of the anchor not given in these Annexes shall correspond to the respective values laid down in the technical documentation<sup>7</sup> of this European Technical Approval.

The characteristic values for the design of the anchorages are given in Annex 6, Annex 12 and Annex 14 to 66.

Each anchor is to be marked with the identifying mark, the type, the diameter and the length of the anchor according to Annex 3.

The minimum embedment depth shall be marked.

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

### 2.2 Methods of verification

The assessment of the fitness of the anchor for the intended use in relation to the requirements for safety in use in the sense of the Essential Requirement 4 has been made in compliance with the Guideline for European Technical Approval of "Plastic Anchors for Multiple Use in Concrete and Masonry for Non-structural Applications", ETAG 020,

- Part 1: "General",
- Part 2: "Plastic Anchors for Use in Normal Weight Concrete",
- Part 3: "Plastic Anchors for Use in Solid Masonry Materials",
- Part 4: "Plastic Anchors for Use in Hollow or Perforated Masonry" and
- Part 5: "Plastic Anchors for Use in Autoclaved Aerated Concrete (AAC)"

based on the use categories a, b, c and d.

In addition to the specific clauses relating to dangerous substances contained in this European Technical Approval, there may be other requirements applicable to 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 Products Directive, these requirements need also to be complied with, when and where they apply.

<sup>7</sup>

The technical documentation of this European Technical Approval is deposited at the Deutsches Institut für Bautechnik 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.

### 3 Evaluation and attestation of conformity and CE marking

#### 3.1 System of attestation of conformity

According to the decision 97/463/EG of the European Commission<sup>8</sup> the system 2(ii) (referred to as system 2+) of attestation of conformity applies.

This system of attestation of conformity is defined as follows.

System 2+: Declaration of conformity of the product by the manufacturer on the basis of:

(a) Tasks for the manufacturer:

- (1) initial type-testing of the product;
- (2) factory production control;
- (3) testing of samples taken at the factory in accordance with a prescribed test plan.

(b) Tasks for the approved body:

- (4) certification of factory production control on the basis of:
  - initial inspection of factory and of factory production control;
  - 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 shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall insure that the product is in conformity with this European Technical Approval.

The manufacturer may only use raw materials stated in the technical documentation of this European Technical Approval.

The factory production control shall be in accordance with the control plan which is part of the technical documentation of this European Technical Approval. The control plan is laid down in the context of the factory production control system operated by the manufacturer and deposited at Deutsches Institut für Bautechnik.<sup>9</sup>

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the control plan.

###### 3.2.1.2 Other tasks of 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 sections 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.

<sup>8</sup> Official Journal of the European Communities L 198 of 25.07.1997.

<sup>9</sup> The control plan is a confidential part of the documentation of the European Technical Approval, but not published together with the ETA and only handed over to the approved body involved in the procedure of attestation of conformity. See section 3.2.2.

### 3.2.2 Tasks of approved bodies

The approved body shall perform the

- initial inspection of factory and of factory production control,
  - continuous surveillance, assessment and approval of factory production control,
- in accordance with the provisions laid down in the control plan.

The approved body shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in a written report.

The approved certification body involved by the manufacturer shall issue an EC certificate of conformity of the factory production control stating the conformity with the factory production control of this European Technical 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 Deutsches Institut für Bautechnik without delay.

### 3.3 CE marking

The CE marking shall be affixed on each packaging of the anchor. The letters "CE" shall be followed by the identification number of the approved certification body, where relevant, and be accompanied by the following additional information:

- the name and address of the producer (legal entity responsible for the manufacturer),
- the last two digits of the year in which the CE marking was affixed,
- the number of the EC certificate for the factory production control,
- the number of the European Technical Approval,
- the number of the guideline for European Technical Approval
- use categories a, b, c and d.

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

### 4.1 Manufacturing

The European Technical Approval is issued for the product on the basis of agreed data/information, deposited with Deutsches Institut für Bautechnik, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to Deutsches Institut für Bautechnik before the changes are introduced. Deutsches Institut für Bautechnik will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alterations to the ETA shall be necessary.

## 4.2 Design of anchorages

### 4.2.1 General

Fitness for the intended use of the anchor is given under the following conditions:

- The design of anchorages is carried out in compliance with ETAG 020, Guideline for European Technical Approval of "Plastic Anchors for Multiple Use in Concrete and Masonry for Non-structural Applications", Annex C under the responsibility of an engineer experienced in anchorages. This design method applies to plastic anchors subject to static or quasi-static actions in tension, shear or combined tension and shear or bending; it is not applicable to plastic anchors loaded in compression or subject to fatigue, impact, or seismic actions.
- Verifiable calculation notes and drawings shall be prepared taking account of the loads to be anchored, the nature and strength of the base materials and the dimensions of the anchorage members as well as of the relevant tolerances.
- The anchor is to be used only for multiple fixing for non-structural applications.

Therefore the design of the fixture may specify the number  $n_1$  of fixing points to fasten the fixture and the number  $n_2$  of anchors per fixing point. Furthermore by specifying the design value of actions  $N_{Sd}$  on a fixing point to a value  $\leq n_3$  (kN) up to which the strength and stiffness of the fixture are fulfilled and the load transfer in the case of excessive slip or failure of one anchor need not to be taken into account in the design of the fixture.

The following default values for  $n_1$ ,  $n_2$  and  $n_3$  may be taken:

$$\begin{array}{llll} n_1 \geq 4; & n_2 \geq 1 & \text{and} & n_3 \leq 4,5 \text{ kN} & \text{or} \\ n_1 \geq 3; & n_2 \geq 1 & \text{and} & n_3 \leq 3,0 \text{ kN}. & \end{array}$$

- Shear loads acting on an anchor may be assumed to act without lever arm if both of the following conditions are fulfilled:
  - The fixture shall be made of metal and in the area of the anchorage be fixed directly to the base material either without an intermediate layer or with a levelling layer of mortar with a thickness  $\leq 3$  mm.
  - The fixture shall be in contact with the anchor over its entire thickness. (Therefore the diameter of clearance hole in the fixture  $d_f$  has to be equal or smaller than the value given in Annex 5, Table 3.)

If these two conditions are not fulfilled the lever arm is calculated according to ETAG 020, Annex C. The characteristic bending moment is given in Annex 6, Table 4.

### 4.2.2 Resistance in concrete (use category "a")

The characteristic values of resistance of the anchor for use in concrete are given in Annex 6, Table 4 and Annex 12, Table 6. The design method is valid for cracked and non-cracked concrete.

According to the Technical Report TR 020 "Evaluation of anchorages in concrete concerning resistance to fire" it can be assumed that for fastening of facade systems the load bearing behaviour of the Würth Plastic Anchor W-UR 10 has a sufficient resistance to fire at least 90 minutes (R90) if the admissible load  $[F_{Rk} / (\gamma_M \cdot \gamma_F)]$  is  $\leq 0,8$  kN (no permanent centric tension load).

#### 4.2.3 Resistance in solid masonry (use category "b")

The characteristic values of resistance of the anchor for use in solid masonry are given in Annex 6, Table 4 and Annex 14, 41, 42, 48 to 53 and 66. These values are independent of the load direction (tension, shear or combined tension and shear) and the mode of failure.

The characteristic resistances given in Annex 14, 41, 42, 48 to 53 and 66 for use in solid masonry are only valid for the base material and the bricks according this tables or larger brick sizes and larger compressive strength of the masonry unit.

If smaller brick sizes are present on the construction site or if the mortar strength is smaller than the required value, the characteristic resistance of the anchor may be determined by job site tests according to 4.4.

#### 4.2.4 Resistance in hollow or perforated masonry (use category "c")

The characteristic resistances for use in hollow or perforated masonry given in Annex 6, Table 4 and Annex 15 to 40, 43 to 47, 54 to 60 and 63 to 65 are only valid for the bricks and blocks according this tables regarding base material, size of the units, compressive strength and configuration of the voids.

These values are independent of the load direction (tension, shear or combined tension and shear) and the mode of failure and are valid for the given  $h_{nom}$  according Annex 13, Table 9.

The influence of larger embedment depths [compare Annex 13, Table 9, footnote 2)] and/or different bricks and blocks (according Annex 15 to 40, 43 to 47, 54 to 60 and 63 to 65 regarding base material, size of the units, compressive strength and configuration of the voids) has to be detected by job site tests according to 4.4.

#### 4.2.5 Resistance in autoclaved aerated concrete (AAC - use category "d")

The characteristic values of resistance of the anchor for use in non-cracked autoclaved aerated concrete (AAC) blocks are given in Annex 61, Table 10.48.3.

The characteristic values of resistance of the anchor for use in (prefabricated) reinforced autoclaved aerated concrete (AAC) are given in Annex 62, Table 10.49.3.

These values are independent of the load direction (tension, shear or combined tension and shear) and the mode of failure.

The anchor shall not be installed and used in water saturated aerated concrete.

#### 4.2.6 Specific conditions for the design method in solid masonry, hollow or perforated masonry and AAC

The mortar strength class of the masonry has to be M 2,5 according to EN 998-2:2003 at minimum.

The characteristic resistance  $F_{Rk}$  for a single plastic anchor may also be taken for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{min}$ .

The distance between single plastic anchors or a group of anchors should be a  $\geq 250$  mm.

If the vertical joints of the wall are designed not to be filled with mortar then the design resistance  $N_{Rd}$  has to be limited to 2,0 kN to ensure that a pull-out of one brick out of the wall will be prevented. This limitation can be omitted if interlocking units are used for the wall or when the joints are designed to be filled with mortar.

If the joints of the masonry are not visible the characteristic resistance  $F_{Rk}$  has to be reduced with the factor  $\alpha_j = 0,5$ .



If the joints of the masonry are visible (e.g. unplastered wall) following has to be taken into account:

- The characteristic resistance  $F_{Rk}$  may be used only, if the wall is designed such that the joints are to be filled with mortar.
- If the wall is designed such that the joints are not to be filled with mortar then the characteristic resistance  $F_{Rk}$  may be used only, if the minimum edge distance  $c_{min}$  to the vertical joints is observed. If this minimum edge distance  $c_{min}$  can not be observed then the characteristic resistance  $F_{Rk}$  has to be reduced with the factor  $\alpha_j = 0,5$ .

For prefabricated reinforced components the following has to be taken into account if no special tests or calculation for the resistance of the member made of AAC will carried out:

- The design value of shear resistance in the member caused by the anchorage are less or equal to 40 % of the design value of resistance of the member in the critical cross section.
- The edge distance  $c$  is  $\geq 150$  mm for slabs of width  $\leq 700$  mm.
- The distance between single plastic anchors or a group of anchors should be  $\geq 600$  mm.

#### 4.2.7 Characteristic values, spacing and dimensions of anchorage member

The minimum spacing and dimensions of anchorage member according to Annex 13, Table 8 and 9 shall be observed depending on the base material.

#### 4.2.8 Displacement behaviour

The displacements under tension and shear loading in concrete, masonry and autoclaved aerated concrete (AAC) are given in Annex 13, Table 7.

#### 4.3 Installation of anchor

The fitness for use of the anchor can only be assumed if the following conditions of installation are met:

- Anchor installation carried out by appropriately qualified personnel under the supervision of the person responsible for technical matters on 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 using the tools indicated in this European Technical Approval:
- Checks before placing the anchor, to ensure that the characteristic values of the base material in which the anchor is to be placed, is identical with the values, which the characteristic loads apply for.
- Observation of the drill method according Annex 15 to 40, 43 to 47, 54 to 60 and 63 to 66 (Drill holes in hollow or perforated masonry may only be drilled using the rotary drill. Other drilling methods may also be used if job-site tests according to 4.4 evaluate the influence of hammer or impact drilling.)
- Placing drill holes without damaging the reinforcement.
- In the absence of national regulations, it is recommended that the distance between the side of the drill hole and the outside of prestressed reinforcement is at least 50 mm; for determining the position of the prestressed reinforcement in the structure, a suitable device (e.g. reinforcement detector) should be used. Annexes 63 to 65 show the admissible anchor positions.
- The anchor shall not be installed and used in water saturated aerated concrete (AAC).
- Holes to be cleaned of drilling dust.
- 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.

- The plastic sleeve is inserted through the fixture by slight hammer blows and the special screw is screwed in until the head of the screw touches the sleeve. The anchor is correct mounted, if there is no turn-through of the plastic sleeve in the drill hole and if slightly move on turning of the screw is impossible after the complete turn-in of the screw.
- Temperature during installation of the anchor (plastic sleeve and base material):
 

W-UR 8:	≥ -40 °C
W-UR 10:	≥ -20 °C

#### 4.4 Job site tests according to ETAG 020, Annex B

##### 4.4.1 General

In the absence of national requirements the characteristic resistance of the plastic anchor may be determined by job site tests, if the plastic anchor has already characteristic values given in Annex 14 to 66 for the same base material as it is present on the construction works.

Furthermore job site tests for use in (different) solid masonry are possible only if the plastic anchor has already characteristic values given in Annex 14, 41, 42, 48 to 53 and 66 for use in solid masonry.

Job site tests for use in (different) hollow or perforated masonry are possible only if the plastic anchor has already characteristic values given in Annex 15 to 40, 43 to 47, 54 to 60 and 63 to 65 for use in hollow or perforated masonry.

Job site tests are also possible, if another drill method is been used as it is given in Annex 15 to 40, 43 to 47, 54 to 60 and 63 to 66.

The characteristic resistance to be applied to a plastic anchor should be determined by means of at least 15 pull-out tests carried out on the construction work with a centric tension load acting on the plastic anchor. These tests may also performed in a laboratory under equivalent conditions as used on construction work

Execution and evaluation of the tests as well as issue of the test report and determination of the characteristic resistance should be supervised by the person responsible for execution of works on site and be carried out by a competent person.

Number and position of the plastic anchors to be tested should be adapted to the relevant special conditions of the construction work in question and, for example, in the case of blind and larger areas be increased such that a reliable information about the characteristic resistance of the plastic anchor embedded in the base material in question can be derived. The tests should take account of the unfavourable conditions of practical execution.

##### 4.4.2 Assembly

The plastic anchor to be tested shall be installed (e. g. preparation of drill hole, drilling tool to be used, drill bit, type of drilling hammer or rotation, thickness of fixture) and as far as spacing and edge distances are concerned be distributed in the same way as foreseen for the intended use.

Depending on the drilling tool hard metal hammer drill bits or hard metal percussion drill bits, respectively, according to ISO 5468 should be used. New drill bits should be used for one test series or drill bits with  $d_{\text{cut,m}} = 8,25 \text{ mm} < d_{\text{cut}} \leq 8,45 \text{ mm} = d_{\text{cut,max}}$  (W-UR 8) or  $d_{\text{cut,m}} = 10,25 \text{ mm} < d_{\text{cut}} \leq 10,45 \text{ mm} = d_{\text{cut,max}}$  (W-UR 10) respectively.

#### 4.4.3 Execution of test

The test rig used for the pull-out tests shall provide a continuous slow increase of the load, controlled by a calibrated load cell. The load shall apply perpendicular to the surface of the base material and shall be transmitted to the anchor via a hinge. The reaction forces shall be transmitted into the base material such that possible breakout of the masonry is not restricted. This condition is considered as fulfilled, if the support reaction forces are transmitted either in adjacent masonry units or at a distance of at least 150 mm from the plastic anchors. The load shall be increased continuously in a way that the ultimate load is reached after about 1 minute. The load is measured when the ultimate load ( $N_1$ ) is achieved.

If no pull-out failure occurs, other test methods are needed, e.g. proof-loading.

#### 4.4.4 Test report

The test report shall include all information necessary to assess the resistance of the tested anchor. It shall be given to the person responsible for the design of the fastening and shall be included in the construction dossier.

The minimum data required are:

- Name of product
- Construction site, owner of building; date and location of the tests, air temperature
- Date and place of tests
- Test rig
- Type of structure to be fixed
- Masonry (type of brick, strength class, all dimensions of bricks, mortar group if possible); visual assessment of masonry (flush joints, joint clearance, regularity)
- Plastic anchor and special screw
- value of the cutting diameter of hard metal hammer-drill bits, measured before and after drilling if no new drill bits are used
- Results of tests including the indication of value  $N_1$ ; mode of failure
- Tests carried out or supervised by ...; signature

#### 4.4.5 Evaluation of test results

The characteristic resistance  $F_{RK1}$  is derived from the measured values  $N_1$  as follows

$$F_{RK1} = 0,5 \cdot N_1$$

The characteristic resistance  $F_{RK1}$  has to be equal or smaller than the characteristic resistance  $F_{RK}$  which is given in the ETA for similar masonry (bricks or blocks)

$$N_1 = \text{the mean value of the five smallest measured values at ultimate load}$$

In absence of national regulations the partial safety factors for the resistance of the plastic anchor may be taken as  $\gamma_{Mm} = 2,5$  for use in masonry.

## 5 Indications to the manufacturer

### 5.1 Responsibility of the manufacturer

It is in the responsibility of the manufacturer to ensure that the information on the specific conditions according to 1 and 2 including Annexes referred to 4 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 packaging and/or on an enclosed instruction sheet, preferably using illustrations.

The minimum data required are:

- base material for the intended use,
- ambient temperature of the base material during installation of the anchor,
- drill bit diameter,
- overall anchor embedment depth in the base material,
- minimum hole depth,
- information on the installation procedure,
- identification of the manufacturing batch.

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

### 5.2 Packaging, transport and storage

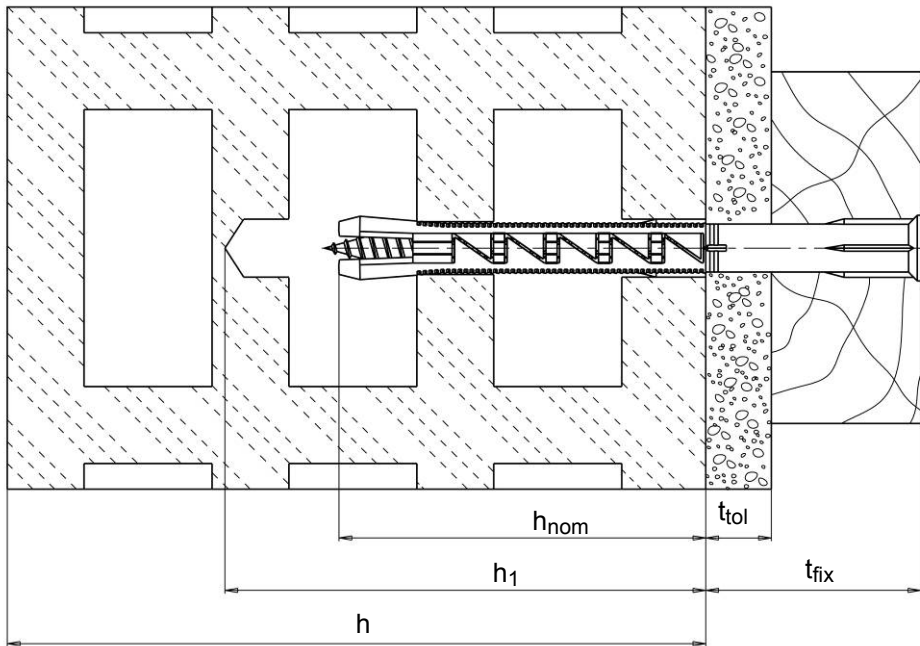
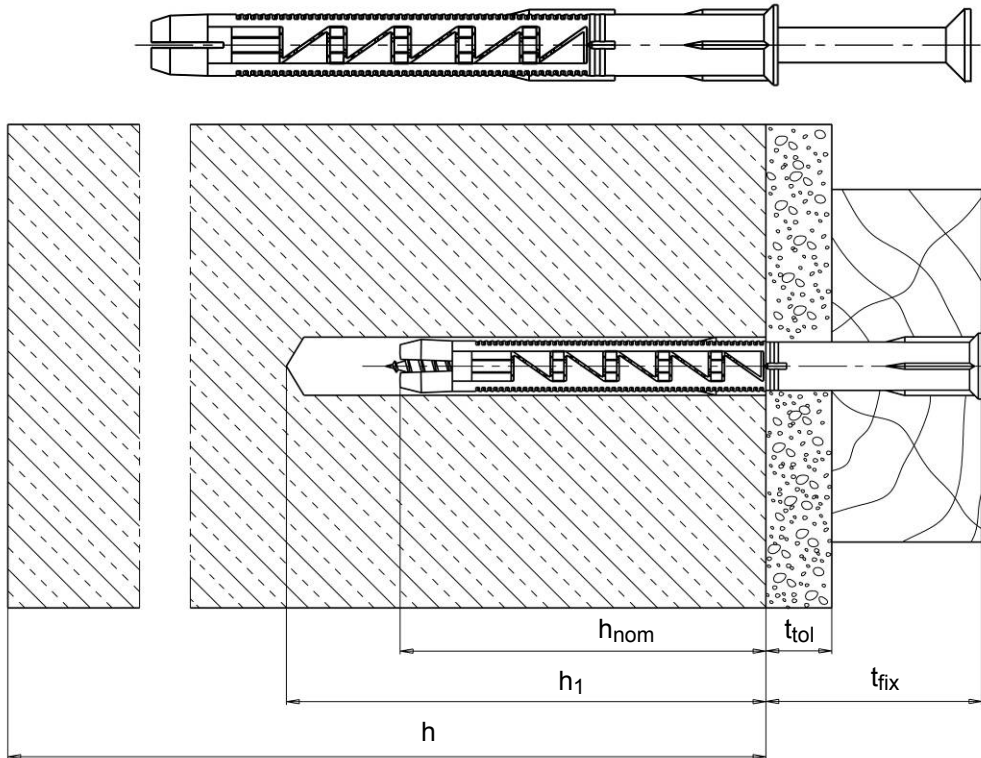
The anchor shall only be packaged and supplied as a complete unit.

The anchor shall be stored under normal climatic conditions in its original light-proof packaging. Before installation, it shall not be extremely dried nor frozen.

Georg Feistel  
Head of Department

*beglaubigt:*  
Scheller

### Plastic Anchor W-UR 10



- $h_{nom}$ : Overall plastic anchor embedment depth in the base material
- $h_1$ : Depth of drill hole to deepest point
- $h$ : Thickness of member
- $t_{fix}$ : Thickness of fixture
- $t_{tol}$ : Thickness of non-load-bearing layer

**Würth Plastic Anchor W-UR**

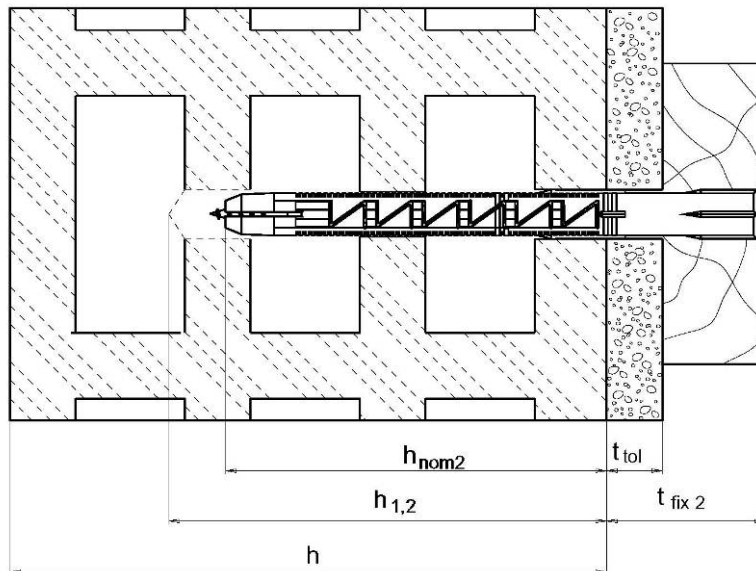
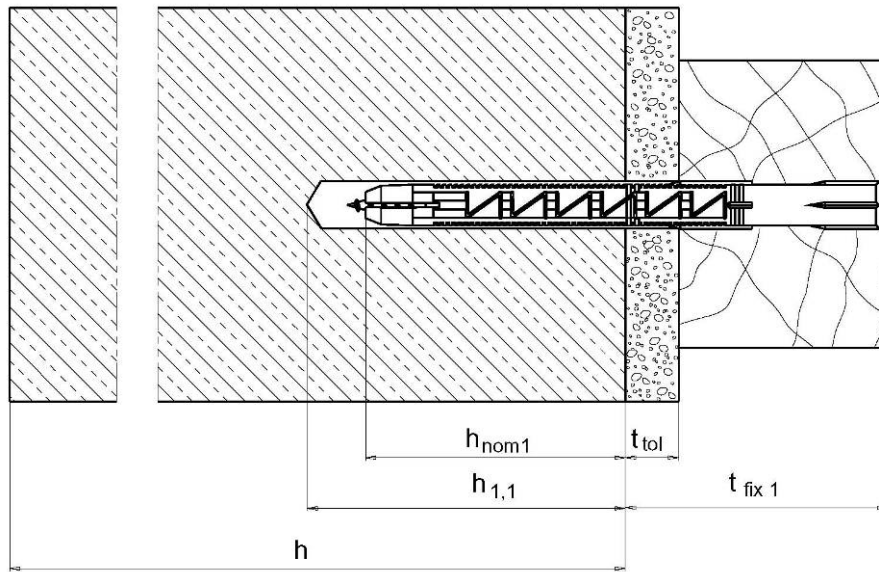
Intended use

**Annex 1**

of European  
Technical Approval

**ETA-08/0190**

### Plastic Anchor W-UR 8

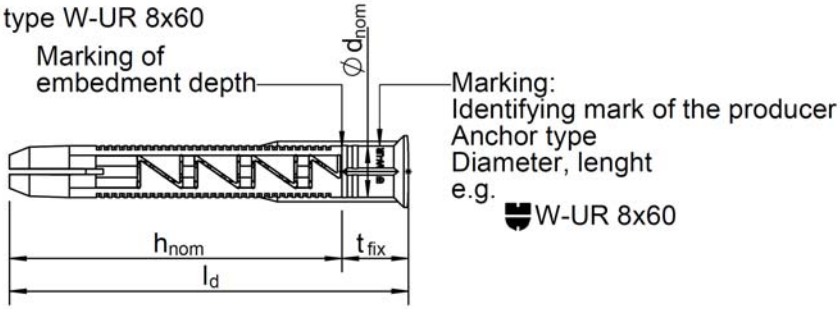


- $h_{nom1}$ : Overall plastic anchor embedment depth in the base material (1)
- $h_{nom2}$ : Overall plastic anchor embedment depth in the base material (2)
- $h_{1,1}$ : Depth of drill hole to deepest point (1)
- $h_{1,2}$ : Depth of drill hole to deepest point (2)
- $h$ : Thickness of member
- $t_{fix1}$ : Thickness of fixture (1)
- $t_{fix2}$ : Thickness of fixture (2)
- $t_{tol}$ : Thickness of non-load-bearing layer

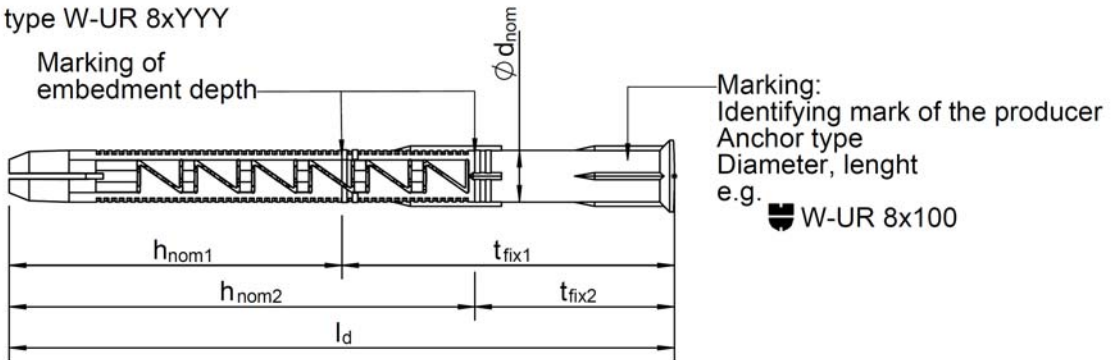
<p><b>Würth Plastic Anchor W-UR</b></p>	<p><b>Annex 2</b></p>
<p>Intended use</p>	<p>of European Technical Approval</p> <p><b>ETA-08/0190</b></p>

**Plastic sleeve**

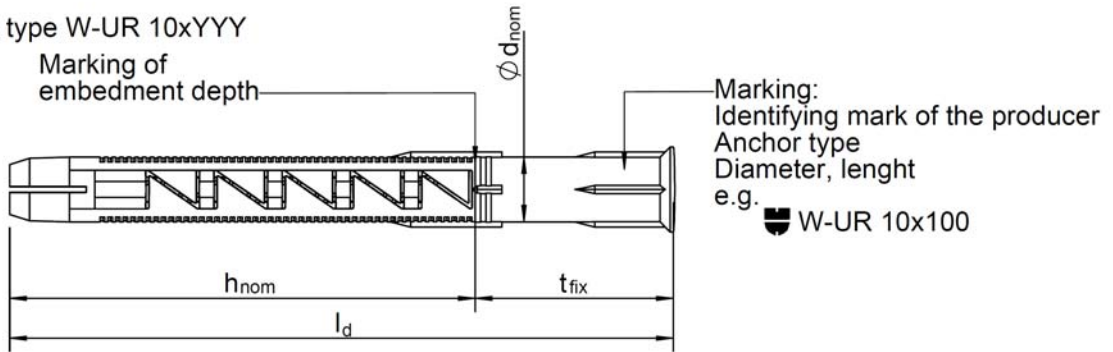
Anchor type W-UR 8x60



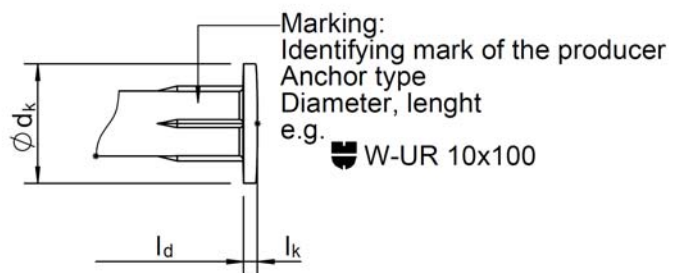
Anchor type W-UR 8xYYY



Anchor type W-UR 10xYYY



Anchor type W-UR F 8 and W-UR F 10



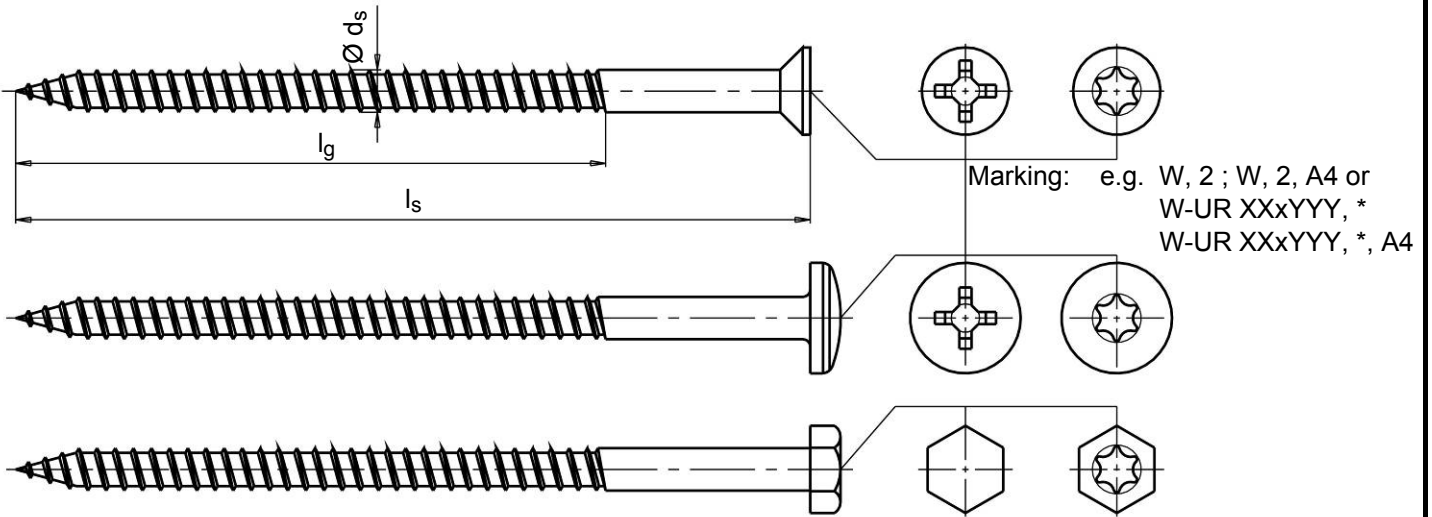
**Würth Plastic Anchor W-UR**

Product  
Head versions

**Annex 3**  
of European  
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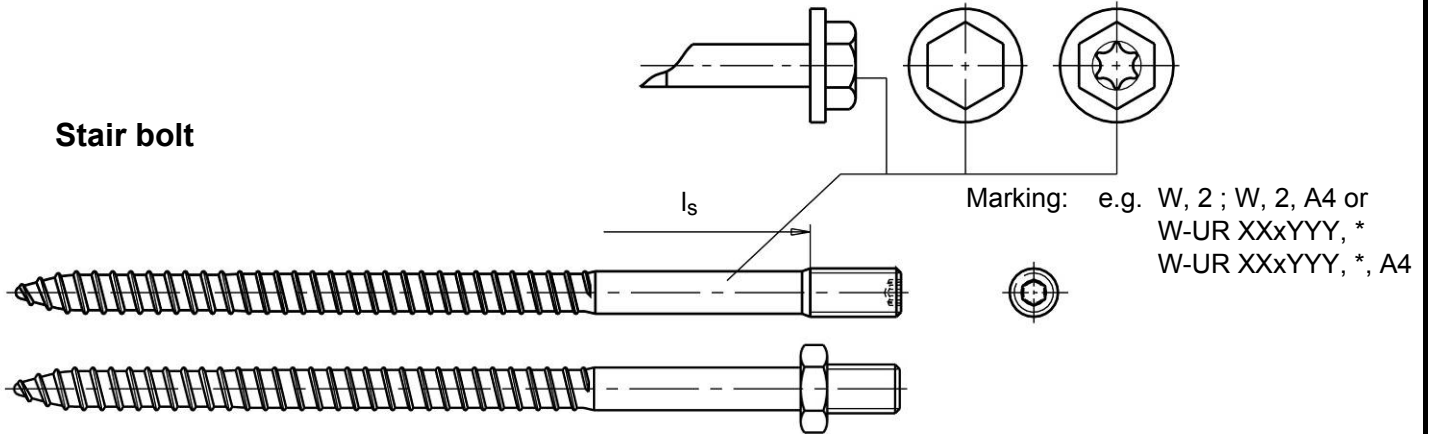
**ETA-08/0190**

**Special screw**



Marking: e.g. W, 2 ; W, 2, A4 or  
W-UR XXxYYY, \*  
W-UR XXxYYY, \*, A4

**Stair bolt**



Marking: e.g. W, 2 ; W, 2, A4 or  
W-UR XXxYYY, \*  
W-UR XXxYYY, \*, A4

**Würth Plastic Anchor W-UR**

Product  
Head versions

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**Table 1: Anchor dimensions**

Anchor type			W-UR 8		W-UR 10
Overall plastic anchor embedment depth in the base material	$h_{nom} \geq$	[mm]	50 ( $h_{nom1}$ )	70 ( $h_{nom2}$ )	70
<b>Plastic sleeve</b>					
Plastic sleeve diameter	$\varnothing d_{nom}$	[mm]	8		10
Length of plastic sleeve	$l_d \geq$	[mm]	51	71	71
Flat collar diameter	$\varnothing d_k$	[mm]	14		18
Thickness of flat collar	$l_k \geq$	[mm]	1.6		2
Thickness of fixture	$t_{fix} \geq$	[mm]	1		1
<b>Special screw</b>					
Screw diameter	$d_s$	[mm]	6		7
Length of screw	$l_s$	[mm]	$l_d + 5$ mm		$l_d + 5$ mm
Length of thread	$l_g$	[mm]	75		75

**Table 2: Materials**

Designation	Material
Plastic sleeve	Polyamid, colour brown
Special screw	Steel ( $f_{uk} \geq 600$ N/mm <sup>2</sup> ; $f_{yk} \geq 480$ N/mm <sup>2</sup> ), acc. to DIN EN ISO 4042, galvanised
	Stainless steel ( $f_{uk} \geq 700$ N/mm <sup>2</sup> ; $f_{yk} \geq 450$ N/mm <sup>2</sup> ), 1.4401 or 1.4571

**Table 3: Installation parameters**

Anchor type			W-UR 8		W-UR 10
Drill hole diameter	$d_0 =$	[mm]	8		10
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	8.45		10.45
Depth of drill hole to deepest point <sup>1)</sup>	$h_1 \geq$	[mm]	60 ( $h_{1,1}$ )	80 ( $h_{1,2}$ )	80
Overall plastic anchor embedment depth in the base material <sup>1), 2)</sup>	$h_{nom} \geq$	[mm]	50 ( $h_{nom1}$ )	70 ( $h_{nom2}$ )	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5		10.5

1) See Annex 1 and 2

2) For hollow and perforated masonry the influence of  $h_{nom} > 70$  mm (W-UR 8 and W-UR 10) has to be detected by job site tests according 4.4.

For anchorages in hollow and perforated masonry with anchor type W-UR 8 ( $h_{nom1} = 50$  mm,  $h_{nom2} = 70$  mm) variable set in the range  $h_{nom1} = 50$  mm  $\leq$   $h_{nom} < 70$  mm =  $h_{nom2}$  the characteristic values  $F_{RK}$  for  $h_{nom1} = 50$  mm may be taken without performing additional job site tests (compare Annex 15, 43 and 45).

For anchorages in hollow and perforated masonry with anchor type W-UR 8x60 ( $h_{nom} = 50$  mm) the influence  $50 < h_{nom} \leq 59$  mm always has to be detected by job site tests.

**Würth Plastic Anchor W-UR**

Anchor dimensions;  
Materials;  
Installation parameters

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**Table 4: Characteristic bending resistance of the special screw in concrete, masonry and autoclaved aerated concrete**

			Galvanised steel		Stainless steel	
			W-UR 8	W-UR 10	W-UR 8	W-UR 10
Characteristic bending resistance	$M_{Rk,s}$	[Nm]	8.8	17.7	10.3	20.6
Partial safety factor	$\gamma_{Ms}^{1)}$	[mm]	1.25	1.25	1.56	1.56

<sup>1)</sup> In absence of other national regulations

**Table 5.1: Base material: Concrete, solid masonry**

Base material	Format	Measurement [mm]	Minimum compressive strength [N/mm <sup>2</sup> ]	Bulk density class [kg/dm <sup>3</sup> ]	Annex
<b>Concrete</b>					
<b>Concrete <math>\geq</math> C12/15</b>					<b>Annex 12</b>
<b>Solid masonry</b>					
<b>Solid brick Mz</b> acc. to DIN 105 EN 771-1	$\geq$ NF	$\geq$ 240x115x71	10 20 28 36	$\geq$ 1.8	<b>Annex 14</b>   AX
<b>Sand-lime solid brick KS</b> acc. to DIN 106 EN 771-2	$\geq$ NF	$\geq$ 240x115x71	10 20 28	$\geq$ 2.0	<b>Annex 41</b>  K
<b>Sand-lime solid brick Silka XL Basic,</b> <b>Sand-lime solid brick Silka XL Plus,</b> acc. to DIN V 106 EN 771-2 Z-17.1-997		$\geq$ 248x175x498	10 20 28	$\geq$ 2.0	<b>Annex 42</b>  W12
<b>Concrete solid block - Vbn</b> acc. to DIN 18153 EN 771-3	$\geq$ NF	$\geq$ 240x115x71	10 20 28	$\geq$ 2.0	<b>Annex 48</b>  O
<b>Lightweight concrete solid brick</b> <b>e.g. Bisoclassic V</b> acc. to DIN V 18152-100 EN 771-3 Bisotherm GmbH	$\geq$ NF	$\geq$ 240x115x71	2 4	$\geq$ 0.9	<b>Annex 49</b>  AI
<b>Lightweight concrete solid brick</b> <b>e.g. Bisobims V</b> acc. to DIN V 18152-100 EN 771-3 Bisotherm GmbH	$\geq$ NF	$\geq$ 240x115x71	2 4	$\geq$ 1.0	<b>Annex 50</b>  AH
<b>Lightweight concrete solid block – Vbl</b> acc. to DIN 18152, e.g. Liapor Massive Wall Liapor GmbH & Co. KG	$\geq$ 24DF	$\geq$ 500x365x238	2	$\geq$ 0.6	<b>Annex 51</b>  LAC2

**Würth Plastic Anchor W-UR**

**Characteristic bending resistance**  
**Base material: Concrete and solid masonry**  
 Format, measurement,  
 minimum compressive strength, Annex

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**Table 5.2: Base material: Solid masonry**

Base material	Format	Measurement [mm]	Minimum compressive strength [N/mm <sup>2</sup> ]	Bulk density class [kg/dm <sup>3</sup> ]	Annex
<b>Solid masonry</b>					
<b>Lightweight concrete solid block – Vbl 2</b> acc. to DIN 18152, Z-17.1-839 e.g. Liapor Compact Liapor GmbH & Co. KG Meier Betonwerke GmbH	≥ 16DF	≥ 498x240x239	2	≥ 0.65	<b>Annex 52</b>  W5
<b>Concrete solid block – Vbn</b> acc. to DIN 18153, e.g. Liapor Element Wall Liapor GmbH & Co. KG	≥ 12DF	≥ 500x175x238	12	≥ 1.4	<b>Annex 53</b>  LC16/18
<b>Autoclaved aerated concrete</b> acc. to DIN 4165 EN 771-1		≥ 499x175x249	2 7	≥ 0.3	<b>Annex 61</b>
<b>Reinforced components autoclaved aerated concrete</b> DIN 4223 EN 12602			2 - 7	≥ 0.4	<b>Annex 62</b>
<b>Gypsum blocks: MultiGips R.max Schallschutzplatte</b> DIN EN 12859		≥ 500x500x100	11.7	≥ 1.2	<b>Annex 66</b>

**Table 5.3: Base material: Hollow or perforated masonry**

Base material	Format	Measurement [mm]	Minimum compressive strength [N/mm <sup>2</sup> ]	Bulk density class [kg/dm <sup>3</sup> ]	Annex
<b>Hollow or perforated masonry</b>					
<b>Hollow brick HLz</b> acc. to DIN 105-1 EN 771-1 e.g. Wienerberger GmbH e.g. Schlagmann Baustoffwerke GmbH & Co. KG	≥ 2DF	≥ 240x115x113	8 12 20	≥ 1.2	<b>Annex 15</b>  E - AY
	≥ 12DF	≥ 373x240x238	6 8 10 12	≥ 1.2	<b>Annex 16</b>  AB
<b>Hollow brick POROTON Planziegel T14</b> acc. to EN 771-1, Z-17.1-625 Schlagmann Baustoffwerke GmbH & Co. KG	≥ 10DF	≥ 248x300x249	6	≥ 0.7	<b>Annex 17</b>  AT
<b>Hollow brick POROTON-T8-P</b> <b>Hollow brick POROTON-T9-P</b> acc. to T8: EN 771-1; Z-17.1-982 T9: EN 771-1; Z-17.1-674 Wienerberger GmbH Schlagmann Baustoffwerke GmbH & Co. KG	≥ 10DF	≥ 248x300x249	6	≥ 0.6	<b>Annex 18</b>  W2
<b>Hollow brick POROTON-T8-MW</b> acc. to EN 771-1; Z-17.1-1041 Wienerberger GmbH Schlagmann Baustoffwerke GmbH & Co. KG	≥ 12DF	≥ 248x365x249	6 8	≥ 0.65	<b>Annex 19</b>  W22
<b>Hollow brick POROTON Planziegel T10</b> acc. to EN 771-1; Z-17.1-889 Wienerberger GmbH Schlagmann Baustoffwerke GmbH & Co. KG	≥ 10DF	≥ 248x300x249	6	≥ 0.65	<b>Annex 20</b>  W15

**Würth Plastic Anchor W-UR**

**Characteristic bending resistance**  
**Base material: Solid and hollow masonry and autoclaved aerated concrete:**  
 Format, measurement, minimum compressive strength, annex

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**Table 5.4: Base material: Hollow or perforated masonry**

Base material	Format	Measurement [mm]	Minimum compressive strength [N/mm <sup>2</sup> ]	Bulk density class [kg/dm <sup>3</sup> ]	Annex
<b>Hollow or perforated masonry</b>					
<b>Hollow brick POROTON S10</b> acc. to EN 771-1 Z-17.1-1017 Wienerberger GmbH Schlagmann Baustoffwerke GmbH & Co. KG	≥ 10DF	≥ 248x300x249	6 8 10	≥ 0.75	<b>Annex 21</b>  W17
<b>Hollow brick POROTON-S11-P 30,0</b> acc. to EN 771-1 Z-17.1-812 Wienerberger GmbH Schlagmann Baustoffwerke GmbH & Co. KG	≥ 10DF	≥ 248x300x249	8	≥ 0.9	<b>Annex 22</b>  W10
<b>Hollow brick POROTON-S11-P 36,5</b> acc. to EN 771-1 Z-17.1-812 Wienerberger GmbH Schlagmann Baustoffwerke GmbH & Co. KG	≥ 12DF	≥ 248x365x249	6	≥ 0.9	<b>Annex 23</b>  AA
<b>Hollow brick for ceiling DIN 4160-BN 0.8-530-250-210 (system Filigran)</b> acc. to DIN 4160 e.g. Wienerberger GmbH		≥ 530x250x210	4	0.8	<b>Annex 24</b>  W16
<b>Hollow brick POROTHERM 25-38 N+F</b> acc. to EN 771-1 Wienerberger Ziegelindustrie GmbH; Austria		≥ 375x250x238	6 8 10	≥ 0.8	<b>Annex 25</b>  P
<b>Hollow brick Blocchi Leggeri</b> EN 771-1 Wienerberger Brunori s.r.l.; Italy		≥ 250x120x330	6	≥ 0.6	<b>Annex 26</b>  AD
<b>Hollow brick for ceiling Blocchi per solaio a travetti</b> EN 771-1 Wienerberger Tacconi s.r.l.; Italy		≥ 420x120x250	10 14	≥ 0.6	<b>Annex 27</b>  AC
<b>Hollow brick MURBRIC T20 and R20</b> EN 771-1 e.g. Wienerberger SAS; France		T20: ≥ 500x200x240 R20: ≥ 500x200x249	6 8 12	≥ 0.7	<b>Annex 28</b>  AS
<b>Hollow brick POROTHERM T30 and R30</b> EN 771-1 e.g. Wienerberger SAS; France		T30: ≥ 373x300x249 R30: ≥ 373x300x250	6 8	≥ 0.7	<b>Annex 29</b>  AG
<b>Hollow brick UNIPOR WS11 CORISO</b> EN 771-1 Z-17.1-1011 UNIPOR Ziegel, Marketing GmbH	≥ 12DF	≥ 247x365x249	10	≥ 0.85	<b>Annex 30</b>  W7
<b>Hollow brick UNIPOR WS14</b> <b>Hollow brick UNIPOR WS12 CORISO</b> EN 771-1 Z-17.1-883 UNIPOR Ziegel, Marketing GmbH	≥ 10DF	≥ 247x300x249	10 12	≥ 0.8	<b>Annex 31</b>  AM

**Würth Plastic Anchor W-UR**

**Characteristic bending resistance**  
**Base material: Hollow masonry:**  
 Format, measurement, minimum compressive strength,  
 annex

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Table 5.5: Base material: Hollow or perforated masonry

Base material	Format	Measurement [mm]	Minimum compressive strength [N/mm <sup>2</sup> ]	Bulk density class [kg/dm <sup>3</sup> ]	Annex
<b>Hollow or perforated masonry</b>					
<b>Hollow brick UNIPOR W14</b> EN 771-1 Z-17.1-679 Z-17.1-636 UNIPOR Ziegel, Marketing GmbH	≥ 10DF	W14-Plan: ≥ 240x300x249 W14-Block: ≥ 240x300x238	6	≥ 0.7	<b>Annex 32</b>     AL
<b>Hollow brick Ladrillo P NV R150</b> EN 771-1 Ceramica La Corona, S.A.; Spain		≥ 276x128x95	12 20 28 36	≥ 1.2	<b>Annex 33</b>     AN
<b>Hollow brick ThermoPlan MZ8</b> EN 771-1 Z-17.1-906 Mein Ziegelhaus GmbH & Co. KG	≥ 12DF	≥ 248x365x249	6 8	≥ 0.6	<b>Annex 34</b>     W3
<b>Hollow brick ThermoPlan MZ10</b> EN 771-1 Z-17.1-1015 Mein Ziegelhaus GmbH & Co. KG	≥ 10DF	≥ 248x300x249	6 8	≥ 0.75	<b>Annex 35</b>     W21
<b>Hollow brick ThermoPlan TS<sup>2</sup></b> EN 771-1 Z-17.1-993 Mein Ziegelhaus GmbH & Co. KG	≥ 9DF	≥ 373x175x249	6 8 10 12 20	≥ 0,9	<b>Annex 36</b>     W8
<b>Hollow brick ThermoPlan TS 13</b> EN 771-1 Z-17.1-914 Mein Ziegelhaus GmbH & Co. KG	≥ 10DF	≥ 248x300x248	8 10	≥ 0,75	<b>Annex 37</b>     W20
<b>Hollow brick THERMOPOR ISO-PD Plus</b> EN 771-1 Z-17.1-840 Thermopor Ziegel-Kontor Ulm GmbH		≥ 307x240x249	6 8	≥ 0,7	<b>Annex 38</b>     W14
<b>Hollow brick THERMOPOR TV 7-Plan</b> EN 771-1 Z-17.1-1005 Thermopor Ziegel-Kontor Ulm GmbH	≥ 12DF	≥ 247x365x249	8	≥ 0,5	<b>Annex 39</b>     W18
<b>Hollow brick THERMOPOR TV 9-Plan</b> EN 771-1 Z-17.1-1006 Thermopor Ziegel-Kontor Ulm GmbH	≥ 10DF	≥ 247x300x249	4 6 8	≥ 0,65	<b>Annex 40</b>     W19
<b>Sand-lime perforated brick KS L acc. to</b> DIN 106-1 EN 771-2	≥ 2DF	≥ 240x115x113	6 8 10 12 16	≥ 1.6	<b>Annex 43</b>     L = Y
<b>Sand-lime perforated brick KS L acc. to</b> DIN 106-1 EN 771-2 e.g. Xella Deutschland GmbH	≥ 8DF	≥ 249x240x238	6 8 10 12 16	≥ 1.4	<b>Annex 44</b>     AK

**Würth Plastic Anchor W-UR**

**Characteristic bending resistance**  
**Base material: Hollow masonry:**  
 Format, measurement, minimum compressive strength,  
 annex

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**Table 5.6: Base material: Hollow or perforated masonry**

Base material	Format	Measurement [mm]	Minimum compressive strength [N/mm <sup>2</sup> ]	Bulk density class [kg/dm <sup>3</sup> ]	Annex
<b>Hollow or perforated masonry</b>					
<b>Sand-lime perforated brick KS L</b> acc. to DIN 106-1 EN 771-2	≥ 12DF	≥ 373x240x238	6 8 10 12 16	≥ 1.4	<b>Annex 45</b>  c
<b>Sand-lime perforated brick KS L</b> acc. to DIN 106-1 EN 771-2 e.g. Xella Deutschland GmbH	≥ 9DF	≥ 373x175x249	6 8 10 12 20	≥ 1.4	<b>Annex 46</b>  w9
<b>Sand-lime perforated brick KS-NT</b> acc. to P-1109/884/07-MPA BS BMO KS-Vertrieb Bielefeld-Münster-Osnabrück GmbH & Co. KG	≥ 4DF	≥ 249x115x248	12 20	≥ 1.2	<b>Annex 47</b>  w11
<b>Hollow brick lightweight concrete 1K Hbl</b> DIN 18151 EN 771-3 e.g. Stark Betonwerk GmbH & Co. KG	≥ 12DF	≥ 490x175x238	2 4	≥ 1.2	<b>Annex 54</b>  AU(8)/ H(10)
<b>Hollow brick lightweight concrete 3K Hbl</b> DIN 18151 EN 771-3 e.g. Heinzmann Baustoffe GmbH, Liapor GmbH & Co. KG	≥ 16DF	≥ 498x240x238	2 4 6	≥ 0.7	<b>Annex 55</b>  R3K
<b>Hollow brick lightweight concrete Liapor-Super-K</b> EN 771-3 Z-17.1-501 Liapor GmbH & Co. KG	≥ 16DF	≥ 495x240x238	2 4	≥ 0.8	<b>Annex 56</b>  S7K
<b>Concrete hollow brick 2K Hbn</b> DIN 18153 e.g. Stark Betonwerk GmbH & Co. KG	≥ 12DF	≥ 375x240x238	2 4 6 8	≥ 1.2	<b>Annex 57</b>  W6
<b>Hollow brick lightweight concrete Gisoton Wärme Dämm Block</b> Z-17.1-873 Gisoton Wandsysteme, Baustoffwerke Gebhart & Söhne GmbH & Co.		≥ 375x300x248	4	≥ 0.8	<b>Annex 58</b>  AO
<b>Hollow brick lightweight concrete Gisoton Thermo Schall</b> Z-15.2-18 Gisoton Wandsysteme, Baustoffwerke Gebhart & Söhne GmbH & Co.		≥ 498x300x248	2	≥ 0.45	<b>Annex 59</b>  AP
<b>Hollow brick lightweight concrete Bisomark<sup>TEC</sup></b> Z-17.1-1026 Bisotherm GmbH	≥ 20DF	≥ 497x300x249	1.6 2 4	≥ 0.4	<b>Annex 60</b>  W23

**Würth Plastic Anchor W-UR**

**Base material: Hollow or perforated masonry**  
Format, measurement,  
minimum compressive strength, annex

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**Table 5.7: Base material: Hollow or perforated masonry**

<b>Base material</b>	<b>Format</b>	<b>Measurement [mm]</b>	<b>Minimum compressive strength [N/mm<sup>2</sup>]</b>	<b>Bulk density class [kg/dm<sup>3</sup>]</b>	<b>Annex</b>
<b>Hollow or perforated masonry</b>					
<b>Precast prestressed hollow core elements VMM-L SCD 20</b> DIN EN 1168, Z-15.10-276 e.g. Ketonía GmbH		≥ 1200x800x200	C45/55	≥ 2.4	<b>Annex 63</b>
<b>Precast prestressed hollow core elements VMM-L EPD 32</b> DIN EN 1168, Z-15.10-276 e.g. Ketonía GmbH		≥ 1200x800x320	C45/55	≥ 2.4	<b>Annex 64</b>
<b>Precast prestressed hollow core elements VMM-L SCD 16</b> DIN EN 1168, Z-15.10-276 e.g. Ketonía GmbH		≥ 1200x400x160	C45/55	≥ 2.4	<b>Annex 65</b>

**Würth Plastic Anchor W-UR****Base material: Hollow or perforated masonry**Format, measurement,  
minimum compressive strength, annex**Annex 11**of European  
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**Table 6: Characteristic resistance for use in concrete**

Anchor type			Galvanised steel			Stainless steel			
			W-UR 8		W-UR 10	W-UR 8		W-UR 10	
Failure of expansion element (special screw)									
Overall plastic anchor embedment depth	$h_{nom}$	[mm]	50	70	70	50	70	70	
Characteristic tension resistance	$N_{Rk,s}$	[kN]	11.8	11.8	18.7	13.7	13.7	21.8	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1.5	1.5	1.5	1.87	1.87	1.87	
Characteristic shear resistance	$V_{Rk,s}$	[kN]	5.9	5.9	9.4	6.9	6.9	10.9	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1.25	1.25	1.25	1.56	1.56	1.56	
<b>Pull-out failure (plastic sleeve)</b>									
<b>Concrete <math>\geq</math> C16/20</b>									
Characteristic resistance	$30^{\circ}C^2) / 50^{\circ}C^3)$	$N_{Rk,p}$	[kN]	4.0	6.0	4.0	4.0	6.0	4.0
	$50^{\circ}C^2) / 80^{\circ}C^3)$	$N_{Rk,p}$	[kN]	3.5	5.0	3.5	3.5	5.0	3.5
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	1.8	1.8	1.8	1.8	1.8	1.8	
<b>Concrete C12/15</b>									
Characteristic resistance	$30^{\circ}C^2) / 50^{\circ}C^3)$	$N_{Rk,p}$	[kN]	3.0	4.0	2.5	3.0	4.0	2.5
	$50^{\circ}C^2) / 80^{\circ}C^3)$	$N_{Rk,p}$	[kN]	2.5	3.5	2.5	2.5	3.5	2.5
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	1.8	1.8	1.8	1.8	1.8	1.8	
<b>Concrete cone failure and concrete edge failure for single anchor and anchor group</b>									
<b>Tension load<sup>4)</sup></b>									
$N_{Rk,c} = 7.2 \cdot \sqrt{f_{ck,cube}} \cdot h_{ef}^{1.5} \cdot \frac{c}{c_{cr,N}} = N_{Rk,p} \cdot \frac{c}{c_{cr,N}}$			with: $h_{ef}^{1.5} = \frac{N_{Rk,p}}{7.2 \cdot \sqrt{f_{ck,cube}}}$ $\frac{c}{c_{cr,N}} \leq 1$						
<b>Shear load<sup>4)</sup></b>									
$V_{Rk,c} = 0.45 \cdot \sqrt{d_{nom}} \cdot (h_{nom} / d_{nom})^{0.2} \cdot \sqrt{f_{ck,cube}} \cdot c_1^{1.5} \cdot \left(\frac{c_2}{1.5c_1}\right)^{0.5} \cdot \left(\frac{h}{1.5c_1}\right)^{0.5}$			with: $\left(\frac{c_2}{1.5 \cdot c_1}\right)^{0.5} \leq 1$ $\left(\frac{h}{1.5 \cdot c_1}\right)^{0.5} \leq 1$						
$c_1$	edge distance closest to the edge in loading direction								
$c_2$	edge distance perpendicular to direction 1								
$f_{ck,cube}$	nominal characteristic concrete compression strength (based on cubes), values for C50/60 at maximum								
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	1.8						

- 1) In absence of other national regulations
- 2) Maximum long term temperature
- 3) Maximum short term temperature
- 4) The design method according to ETAG 020, Annex C is to be used

**Würth Plastic Anchor W-UR**

Characteristic resistance for use in concrete

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**Table 7: Displacements<sup>1)</sup> under tension and shear loading in concrete, masonry and AAC**

	$h_{nom}$ [mm]	Tension load			Shear load		
		$F^2)$ [kN]	$\delta_{N0}$ [mm]	$\delta_{N\infty}$ [mm]	$F^2)$ [kN]	$\delta_{V0}$ [mm]	$\delta_{V\infty}$ [mm]
<b>W-UR 8</b> Concrete $\geq$ C16/20	50	1,8	0,26	0,52	1,8	0,96	1,44
<b>W-UR 8</b> Concrete $\geq$ C16/20	70	2,4	0,35	0,7	2,4	0,93	1,86
<b>W-UR 10</b> Concrete $\geq$ C16/20	70	1,8	0,16	0,32	1,8	1,18	1,76

<sup>1)</sup> Valid for all ranges of temperatures

<sup>2)</sup> Intermediate values by linear interpolation

**Table 8: Minimum thickness of member, edge distance and anchor spacing in concrete**

**W-UR 8:** Fixing points with a spacing  $s_{cr,N} \leq 100$  mm are considered as a group with a max. characteristic resistance  $N_{Rk,p}$  acc. to Table 6. For  $s_{cr,N} > 100$  mm, the anchors are considered as single anchors, each with a characteristic resistance  $N_{Rk,p}$  acc. to Table 6.

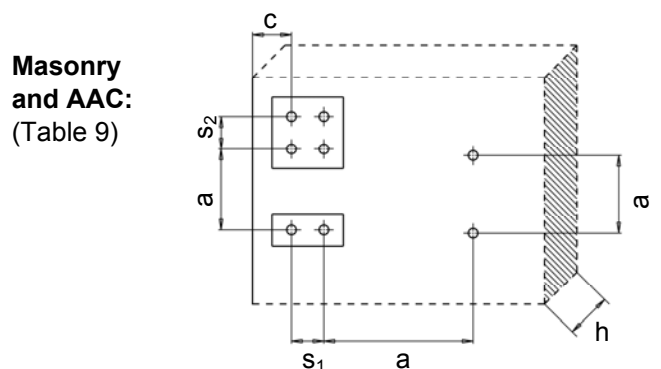
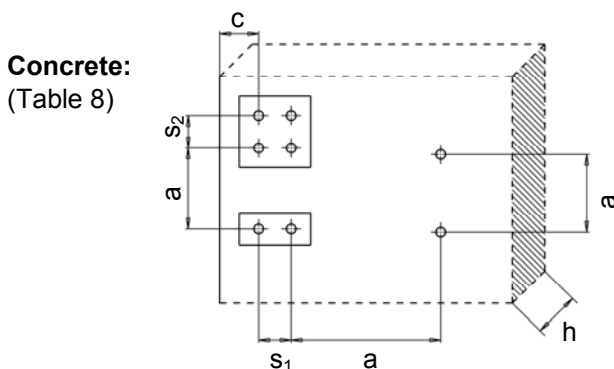
**W-UR 10:** Fixing points with a spacing  $s_{cr,N} \leq 75$  mm are considered as a group with a max. characteristic resistance  $N_{Rk,p}$  acc. to Table 6. For  $s_{cr,N} > 75$  mm, the anchors are considered as single anchors, each with a characteristic resistance  $N_{Rk,p}$  acc. to Table 6.

	$h_{nom}$ [mm]	$h_{min}$ [mm]	$c_{cr,N}$ [mm]	$c_{min}$ [mm]	$s_{min}$ [mm]
<b>W-UR 8</b>	Concrete $\geq$ C16/20	= 50	100	40	40
	Concrete C12/15	= 50	100	60	60
	Concrete $\geq$ C16/20	> 50	100	50	50
	Concrete C12/15	> 50	100	70	70
<b>W-UR 10</b>	Concrete $\geq$ C16/20	$\geq 70$	100	100	70
	Concrete C12/15	$\geq 70$	100	140	100

**Table 9: Minimum thickness of member, edge distance and anchor spacing in masonry and AAC**

	$h_{min}$ [mm]	Masonry		Autoclaved aerated concrete		(Prefabricated) Reinforced AAC
		W-UR 8	W-UR 10	W-UR 8	W-UR 10	W-UR 10
Minimum thickness of member	$h_{min}$ [mm]	100 <sup>1)</sup>	100 <sup>1)</sup>	175	175	175
<b>Single anchor</b>						
Minimum spacing	$a_{min}$ [mm]	250	250	250	250	600
Minimum edge distance	$c_{min}$ [mm]	100 <sup>1)</sup>	100 <sup>1)</sup>	60	80	150
<b>Anchor group</b>						
Spacing perpendicular to free edge	$s_{1,min}$ [mm]	100	100	80	100	100
Spacing parallel to free edge	$s_{2,min}$ [mm]	100	100	80	100	100
Minimum edge distance	$c_{min}$ [mm]	100 <sup>1)</sup>	100 <sup>1)</sup>	80	100	150

<sup>1)</sup>  $h_{min}$  and  $c_{min}$  depend on the brick size and/or on the brick: See the following annexes 14 to 66!



**Würth Plastic Anchor W-UR**

Displacements;  
Minimum thickness of member, edge distance  
and anchor spacing

**Annex 13**

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**Base material solid masonry: Solid brick Mz, NF****Table 10.1.1: Brick data**

Description of brick		AX	Mz
Type of brick			Solid brick Mz
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	1.8
Standard, approval			DIN 105; EN 771-1
Format (measurement)		[mm]	$\geq$ NF ( $\geq$ 240x115x71)
Minimum thickness of member	$h_{\min} =$	[mm]	115

**Table 10.1.2: Installation parameters**

Anchor size		W-UR 8	W-UR 10		
Drill hole diameter	$d_0 =$	[mm]	8	10	
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45	10.45	
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	60	80	80
Drill method		[-]	Hammer drilling	Hammer drilling	
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$	[mm]	50	70	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5	10.5	
Minimum edge distance	$c_{\min} \geq$	[mm]	100	100	

**Table 10.1.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	W-UR 10		
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$	[mm]	<b>50</b>	<b>70</b>	<b>70</b>
<b>Solid brick Mz, <math>f_b \geq 10</math> N/mm<sup>2</sup></b>	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	1.2	1.5	2.0
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	1.2	1.5	1.5
<b>Solid brick Mz, <math>f_b \geq 20</math> N/mm<sup>2</sup></b>	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	2.0	2.0	3.0
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	2.0	2.0	2.0
<b>Solid brick Mz, <math>f_b \geq 28</math> N/mm<sup>2</sup></b>	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	2.5	3.0	4.0
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	2.5	3.0	3.0
<b>Solid brick Mz, <math>f_b \geq 36</math> N/mm<sup>2</sup></b>	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	3.5	4.0	5.0
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	3.5	4.0	4.0
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	2.5	2.5	

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Solid masonry: Solid brick Mz, NF**

Brick data, installation parameters,  
characteristic resistance

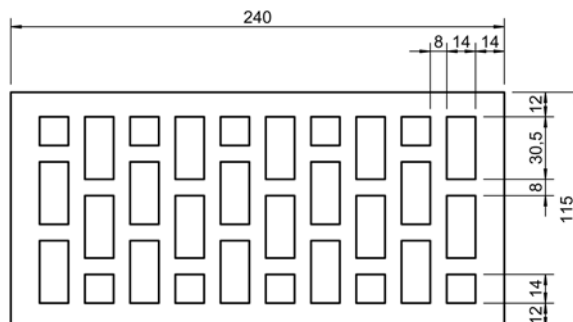
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**Base material hollow masonry: Hollow brick HLz, 2DF****Table 10.2.1: Brick data**

Description of brick	E = AY	HLz
Type of brick		Hollow brick
Bulk density	$\rho \geq$ [kg/dm <sup>3</sup> ]	1.2
Standard, approval		DIN 105; EN 771-1
Producer of brick		e.g. Wienerberger GmbH
Format (measurement)	[mm]	$\geq 2DF (\geq 240 \times 115 \times 113)$
Minimum thickness of member	$h_{\min} =$ [mm]	115

**Table 10.2.2: Installation parameters**

Anchor size		W-UR 8	W-UR 10
Drill hole diameter	$d_0 =$ [mm]	8	10
Cutting diameter of drill bit	$d_{\text{cut}} \leq$ [mm]	8.45	10.45
Depth of drill hole to deepest point	$h_1 \geq$ [mm]	60   80	80
Drill method	[-]	Rotary drilling	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$ [mm]	50   70	70
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	8.5	10.5
Minimum edge distance	$c_{\min} \geq$ [mm]	100	100

**Table 10.2.3: Characteristic resistance  $F_{Rk}^{1)}$  in [kN] for single anchor**

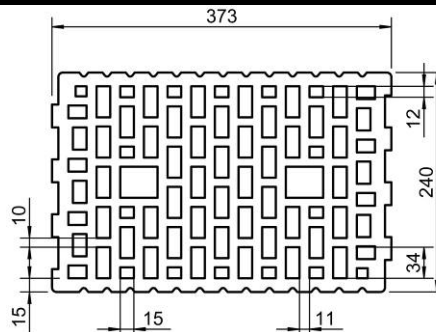
Anchor size		W-UR 8	W-UR 10
Overall plastic anchor embedment depth	$h_{\text{nom}}$ [mm]	$\geq 50^{5)}$   = 70	= 70
<b>Hollow brick HLz, <math>f_b \geq 8 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^{3)}$ / $50^\circ\text{C}^{4)}$ [kN]	0.6	0.9
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)}$ / $80^\circ\text{C}^{4)}$ [kN]	0.5	0.75
<b>Hollow brick HLz, <math>f_b \geq 12 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^{3)}$ / $50^\circ\text{C}^{4)}$ [kN]	0.9	1.5
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)}$ / $80^\circ\text{C}^{4)}$ [kN]	0.75	0.9
<b>Hollow brick HLz, <math>f_b \geq 20 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^{3)}$ / $50^\circ\text{C}^{4)}$ [kN]	1.5	2.5
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)}$ / $80^\circ\text{C}^{4)}$ [kN]	1.2	1.5
Partial safety factor	$\gamma_{Mm}^{2)}$ [-]	2.5	2.5

- 1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.
- 2) In absence of other national regulations
- 3) Maximum long term temperature
- 4) Maximum short term temperature
- 5) The given values  $F_{Rk}$  in this column are valid for the embedment depth range  $50 \text{ mm} \leq h_{\text{nom}} < 70 \text{ mm}$  (see Annex 5, Table 3).  
For Plastic anchors W-UR 8 set variable in this range no additional job site tests have necessarily to be performed.

**Würth Plastic Anchor W-UR****Hollow brick HLz, 2DF**Brick data, installation parameters,  
characteristic resistance**Annex 15**of European  
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**Base material hollow masonry: Hollow brick HLz, 12DF****Table 10.3.1: Brick data**

Description of brick		AB	HLz
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	1.2
Standard, approval			DIN 105; EN 771-1
Producer of brick			e.g. Schlagmann Baustoffwerke GmbH & Co. KG
Format (measurement)		[mm]	$\geq 12DF (\geq 373 \times 240 \times 238)$
Minimum thickness of member	$h_{\min} =$	[mm]	240

**Table 10.3.2: Installation parameters**

Anchor size		W-UR 8	W-UR 10	
Drill hole diameter	$d_0$	[mm]	8	10
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45	10.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80	80
Drill method		[-]	Rotary drilling	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5	10.5
Minimum edge distance	$c_{\min} \geq$	[mm]	45	100

**Table 10.3.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	W-UR 10	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	<b>70</b>	<b>70</b>
<b>Hollow brick HLz, <math>f_b \geq 6 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.6	0.9
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.6	0.75
<b>Hollow brick HLz, <math>f_b \geq 8 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.9	1.2
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.9	0.9
<b>Hollow brick HLz, <math>f_b \geq 10 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	1.2	1.5
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	1.2	1.2
<b>Hollow brick HLz, <math>f_b \geq 12 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	1.2	2.0
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	1.2	1.5
Partial safety factor	$\gamma_{Mm}^2)$	[-]	2.5	2.5

<sup>1)</sup> Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

<sup>2)</sup> In absence of other national regulations

<sup>3)</sup> Maximum long term temperature

<sup>4)</sup> Maximum short term temperature

**Würth Plastic Anchor W-UR****Hollow brick HLz, 12DF**

Brick data, installation parameters, characteristic resistance

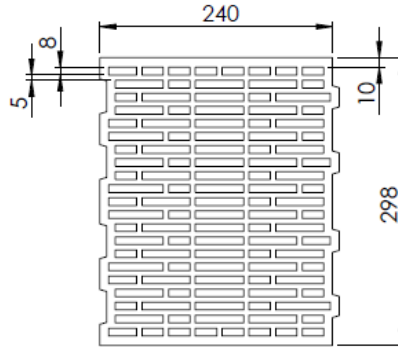
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**Base material hollow masonry: Hollow brick POROTON Planziegel T14, 10DF****Table 10.4.1: Brick data**

Description of brick		AT	POROTON Planziegel T14
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.7
Standard, approval			EN 771-1; Z-17.1-625
Producer of brick			Schlagmann Baustoffwerke GmbH & Co. KG Ziegeleistraße 1 D-84367 Zeilarn
Format (measurement)		[mm]	$\geq 10DF$ ( $\geq 248 \times 300 \times 249$ )
Minimum thickness of member	$h_{\min} =$	[mm]	300

**Table 10.4.2: Installation parameters**

Anchor size			W-UR 8
Drill hole diameter	$d_0$	[mm]	8
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100

**Table 10.4.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size			W-UR 8
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
<b>Hollow brick POROTON Planziegel T14, <math>f_b \geq 6 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.4
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.4
Partial safety factor	$\gamma_{Mm}$ <sup>2)</sup>	[-]	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Hollow brick POROTON Planziegel T14, 10DF**

Brick data, installation parameters,  
characteristic resistance

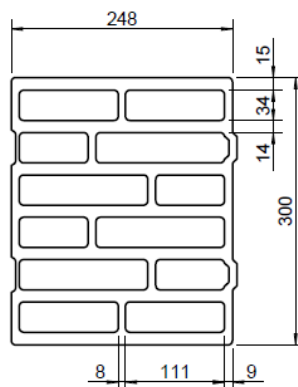
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**Base material hollow masonry: Hollow brick POROTON-T8-30,0-P and POROTON-T9-30,0-P****Table 10.5.1: Brick data**

Description of brick		POROTON-T8-30,0-P and POROTON-T9-30,0-P	
Type of brick	w2		Hollow brick POROTON-T8-P, -T9-P
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.6
Standard, approval			T8: EN 771-1; Z-17.1-982 T9: EN 771-1; Z-17.1-674
Producer of brick			Wienerberger GmbH Oldenburger Allee 26 D-30659 Hannover  Schlagmann Baustoffwerke GmbH & Co. KG Ziegeleistraße 1 D-84367 Zeilarn
Measurement		[mm]	$\geq 10DF (\geq 248 \times 300 \times 249)$
Minimum thickness of member	$h_{\min} =$	[mm]	300

**Table 10.5.2: Installation parameters**

Anchor size		W-UR 8	W-UR 10	
Drill hole diameter	$d_0$	[mm]	8	10
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45	10.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80	80
Drill method		[-]	Rotary drilling	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5	10.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100	100

**Table 10.5.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	W-UR 10	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70	70
POROTON-T8-30,0-P and POROTON-T9-30,0-P, $f_b \geq 6 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	0.9	1.5
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.9	0.9
Characteristic resistance $F_{Rk}$				
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	2.5	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Hollow brick: POROTON-T8-30,0-P,  
POROTON-T9-30,0-P**

Brick data, installation parameters,  
characteristic resistance

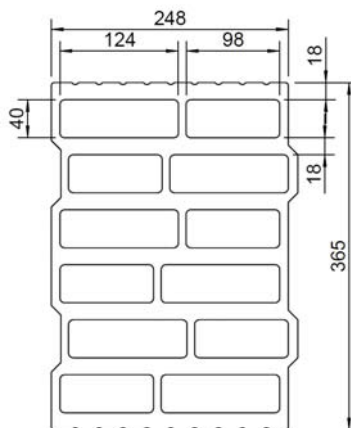
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**Base material hollow masonry: Hollow brick POROTON-T8-36,5-MW****Table 10.6.1: Brick data**

Description of brick		w22	POROTON-T8-36,5-MW
Type of brick			Hollow brick POROTON-T8-36,5-MW
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.65
Standard, approval			EN 771-1; Z-17.1-1041
Producer of brick			Wienerberger GmbH Oldenburger Allee 26 D-30659 Hannover
Measurement		[mm]	$\geq 12DF (\geq 248 \times 365 \times 249)$
Minimum thickness of member	$h_{min} =$	[mm]	365

**Table 10.6.2: Installation parameters**

Anchor size		W-UR 8	W-UR 10	
Drill hole diameter	$d_0$	[mm]	8	10
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	8.45	10.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80	80
Drill method		[-]	Rotary drilling	Rotary drilling
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	70	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5	10.5
Minimum edge distance	$c_{min} \geq$	[mm]	100	100

**Table 10.6.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	W-UR 10	
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	<b>70</b>	<b>70</b>
<b>POROTON-T8-36,5-MW,</b> $f_b \geq 6 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$	[kN]	1.2	0.9
	$50^\circ\text{C}^3 / 80^\circ\text{C}^4$	[kN]	0.9	1.2
<b>POROTON-T8-36,5-MW,</b> $f_b \geq 8 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$	[kN]	1.5	0.9
	$50^\circ\text{C}^3 / 80^\circ\text{C}^4$	[kN]	1.5	1.2
Partial safety factor	$\gamma_{Mm}^2$	[-]	2.5	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Hollow brick: POROTON-T8-36,5- MW**

Brick data, installation parameters,  
characteristic resistance

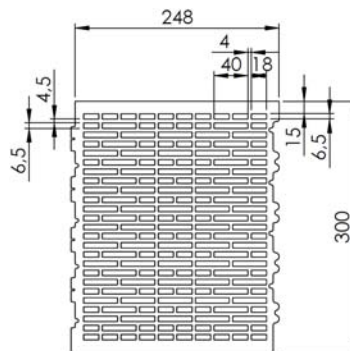
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**Base material hollow masonry: Hollow brick POROTON Planziegel T10****Table 10.7.1: Brick data**

Description of brick		POROTON Planziegel T10	
Type of brick		Hollow brick POROTON Planziegel T10	
Bulk density	$\rho \geq$ [kg/dm <sup>3</sup> ]	0.65	
Standard, approval		T10: EN 771-1; Z-17.1-889	
Producer of brick		Wienerberger GmbH Oldenburger Allee 26 D-30659 Hannover  Schlagmann Baustoffwerke GmbH & Co. KG Ziegeleistraße 1 D-84367 Zeilarn	
Measurement	[mm]	$\geq 10DF (\geq 248 \times 300 \times 249)$	
Minimum thickness of member	$h_{min} =$ [mm]	300	

**Table 10.7.2: Installation parameters**

Anchor size		W-UR 8	
Drill hole diameter	$d_0$ [mm]	8	
Cutting diameter of drill bit	$d_{cut} \leq$ [mm]	8.45	
Depth of drill hole to deepest point	$h_1 \geq$ [mm]	80	
Drill method	[-]	Rotary drilling	
Overall plastic anchor embedment depth	$h_{nom} =$ [mm]	70	
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	8.5	
Minimum edge distance	$c_{min} \geq$ [mm]	100	

**Table 10.7.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	
Overall plastic anchor embedment depth	$h_{nom} =$ [mm]	70	
POROTON Planziegel T10-30, $f_b \geq 6 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$ [kN]	0.5	
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	0.5	
Characteristic resistance $F_{Rk}$			
Partial safety factor	$\gamma_{Mm}^{2)}$ [-]	2.5	

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Hollow brick: POROTON Planziegel T10**

Brick data, installation parameters,  
characteristic resistance

**Annex 20**

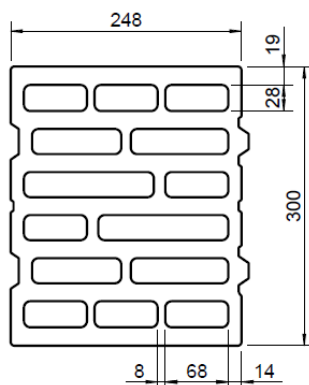
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**Base material hollow masonry: Hollow brick POROTON S10****Table 10.8.1: Brick data**

Description of brick		POROTON S10	
Type of brick		Hollow brick POROTON S10	
Bulk density	$\rho \geq$ [kg/dm <sup>3</sup> ]	0.75	
Standard, approval		S10: EN 771-1; Z-17.1-1017	
Producer of brick		Wienerberger GmbH Oldenburger Allee 26 D-30659 Hannover  Schlagmann Baustoffwerke GmbH & Co. KG Ziegeleistraße 1 D-84367 Zeilarn	
Measurement	[mm]	$\geq 10DF (\geq 248 \times 300 \times 249)$	
Minimum thickness of member	$h_{\min} =$ [mm]	300	

**Table 10.8.2: Installation parameters**

Anchor size		W-UR 8	
Drill hole diameter	$d_0$ [mm]	8	
Cutting diameter of drill bit	$d_{\text{cut}} \leq$ [mm]	8.45	
Depth of drill hole to deepest point	$h_1 \geq$ [mm]	80	
Drill method	[-]	Rotary drilling	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$ [mm]	70	
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	8.5	
Minimum edge distance	$c_{\min} \geq$ [mm]	50	100

**Table 10.8.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$ [mm]	70	
<b>POROTON S10-30, <math>f_b \geq 6 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$ [kN]	0.6	0.6
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	0.6	0.6
<b>POROTON S10-30, <math>f_b \geq 8 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$ [kN]	0.75	0.75
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	0.75	0.75
<b>POROTON S10-30, <math>f_b \geq 10 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$ [kN]	0.9	1.5
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	0.9	1.5
Partial safety factor	$\gamma_{Mm}^{2)}$ [-]	2.5	

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
 The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Hollow brick: POROTON S10**

Brick data, installation parameters,  
 characteristic resistance

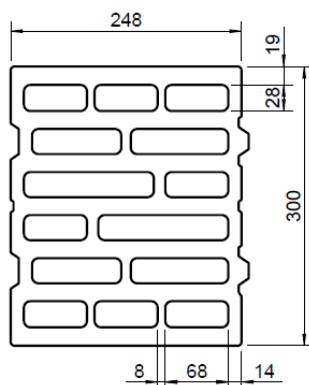
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**Base material hollow masonry: Hollow brick POROTON-S11-30,0-P****Table 10.9.1: Brick data**

Description of brick		W10		Hollow brick POROTON-S11-30,0-P	
Type of brick				Hollow brick S11-30,0-P	
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]		0.9	
Standard, approval				EN 771-1; Z-17.1-812	
Producer of brick				Wienerberger GmbH Oldenburger Allee 26 D-30659 Hannover  Schlagmann Baustoffwerke GmbH & Co. KG Ziegeleistraße 1 D-84367 Zeilarn	
Measurement			[mm]	$\geq 10DF (\geq 248 \times 300 \times 249)$	
Minimum thickness of member	$h_{min} =$	[mm]		300	

**Table 10.9.2: Installation parameters**

Anchor size			W-UR 8	W-UR 10
Drill hole diameter	$d_0$	[mm]	8	10
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	8.45	10.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80	80
Drill method		[-]	Rotary drilling	Rotary drilling
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	70	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5	10.5
Minimum edge distance	$c_{min} \geq$	[mm]	100	100

**Table 10.9.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size			W-UR 8	W-UR 10
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	<b>70</b>	<b>70</b>
<b>POROTON-S11-30,0-P <math>f_b \geq 8 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	2.0	1.5
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	2.0	1.5
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	2.5	2.5

- 1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.
- 2) In absence of other national regulations
- 3) Maximum long term temperature
- 4) Maximum short term temperature

**Würth Plastic Anchor W-UR**

**Hollow brick: POROTON-S11-30,0-P**  
Brick data, installation parameters,  
characteristic resistance

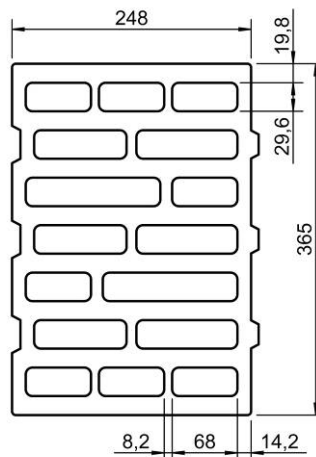
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**Base material hollow masonry: Hollow brick POROTON-S11-36,5-P****Table 10.10.1: Brick data**

Description of brick		AA	Hollow brick POROTON-S11-36,5-P
Type of brick			Hollow brick S11-36,5-P
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.9
Standard, approval			EN 771-1; Z-17.1-812
Producer of brick			Wienerberger GmbH Oldenburger Allee 26 D-30659 Hannover  Schlagmann Baustoffwerke GmbH & Co. KG Ziegeleistraße 1 D-84367 Zeilarn
Measurement		[mm]	$\geq 248 \times 365 \times 249$
Minimum thickness of member	$h_{\min} =$	[mm]	365

**Table 10.10.2: Installation parameters**

Anchor size			W-UR 8	W-UR 10
Drill hole diameter	$d_0$	[mm]	8	10
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45	10.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80	80
Drill method		[-]	Rotary drilling	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5	10.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100	100

**Table 10.10.3: Characteristic resistance  $F_{Rk}^{1)}$  in [kN] for single anchor**

Anchor size			W-UR 8	W-UR 10
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	<b>70</b>	<b>70</b>
<b>POROTON-S11-36,5-P <math>f_b \geq 6 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	2.0	2.0
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	2.0	1.5
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	2.5	2.5

- 1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.
- 2) In absence of other national regulations
- 3) Maximum long term temperature
- 4) Maximum short term temperature

**Würth Plastic Anchor W-UR**

**Hollow brick: POROTON-S11-36,5-P**  
Brick data, installation parameters,  
characteristic resistance

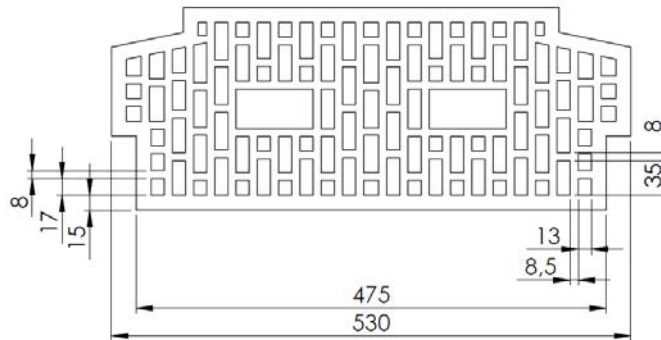
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**Base material hollow brick for ceiling DIN 4160-BN 0,8-530-250-210 (system Filigran)****Table 10.11.1: Brick data**

Description of brick		Brick for ceiling (system Filigran)	
Type of brick		Brick for ceiling	
Bulk density	$\rho \geq$ [kg/dm <sup>3</sup> ]	0.8	
Standard, approval		DIN 4160	
Producer of brick		Wienerberger GmbH Oldenburger Allee 26 D-30659 Hannover	
Measurement	[mm]	$\geq 530 \times 250 \times 210$	
Minimum thickness of member	$h_{\min} =$ [mm]	210	

**Table 10.11.2: Installation parameters**

Anchor size			W-UR 8
Drill hole diameter	$d_0$	[mm]	8
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100

**Table 10.11.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size			W-UR 8
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Brick for ceiling (system Filigran), $f_b \geq 4 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.9
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.9
Partial safety factor	$\gamma_{Mm}^2)$	[-]	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Brick for ceiling (system Filigran)**

Brick data, installation parameters,  
characteristic resistance

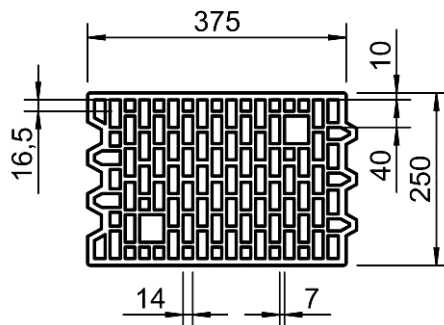
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**Base material hollow masonry: Hollow brick POROTHERM 25-38 N+F****Table 10.12.1: Brick data**

Brick data		P	POROTHERM 25-38 N+F
Type of brick			Hollow brick POROTHERM 25-38 N+F
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.8
Standard, approval			EN 771-1
Producer of brick			Wienerberger Ziegelindustrie GmbH Hauptstraße A-2332 Hennersdorf, Austria
Measurement		[mm]	$\geq 375 \times 250 \times 238$
Minimum thickness of member	$h_{\min} =$	[mm]	250

**Table 10.12.2: Installation parameters**

Anchor size		W-UR 8	W-UR 10
Drill hole diameter	$d_0$ [mm]	8	10
Cutting diameter of drill bit	$d_{\text{cut}} \leq$ [mm]	8.45	10.45
Depth of drill hole to deepest point	$h_1 \geq$ [mm]	80	80
Drill method	[-]	Rotary drilling	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$ [mm]	70	70
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	8.5	10.5
Minimum edge distance	$c_{\min} \geq$ [mm]	100	100

**Table 10.12.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	W-UR 10
Overall plastic anchor embedment depth	$h_{\text{nom}} =$ [mm]	<b>70</b>	<b>70</b>
<b>Hollow brick POROTHERM 25-38 N+F, <math>f_b \geq 6 \text{ N/mm}^2</math></b> Characteristic resistance $F_{Rk}$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$ [kN]	0.75	0.9
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$ [kN]	0.6	0.6
<b>Hollow brick POROTHERM 25-38 N+F, <math>f_b \geq 8 \text{ N/mm}^2</math></b> Characteristic resistance $F_{Rk}$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$ [kN]	0.9	1.2
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$ [kN]	0.9	0.9
<b>Hollow brick POROTHERM 25-38 N+F, <math>f_b \geq 10 \text{ N/mm}^2</math></b> Characteristic resistance $F_{Rk}$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$ [kN]	1.2	1.5
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$ [kN]	0.9	1.2
Partial safety factor	$\gamma_{Mm}^2)$ [-]	2.5	2.5

<sup>1)</sup> Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

<sup>2)</sup> In absence of other national regulations

<sup>3)</sup> Maximum long term temperature

<sup>4)</sup> Maximum short term temperature

**Würth Plastic Anchor W-UR****Hollow brick: POROTHERM 25-38 N+F**

Brick data, installation parameters,  
characteristic resistance

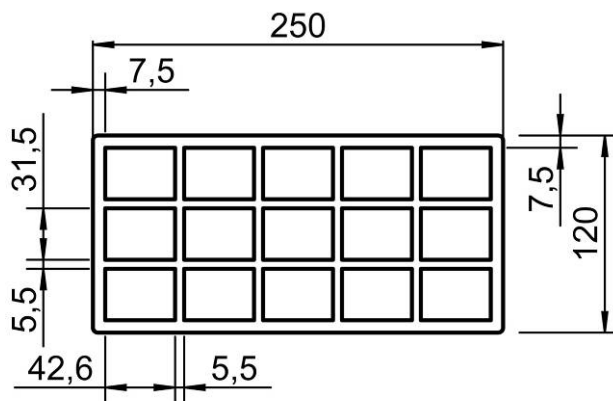
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**Base material hollow masonry: Hollow brick Blocchi Leggeri****Table 10.13.1: Brick data**

Description of brick		AD	Blocchi Leggeri
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.6
Standard, approval			EN 771-1
Producer of brick			Wienerberger Brunori s.r.l. Via Ringhiera 1 I-40020 Mordano (Bologna) fraz. Bubano Italy
Measurement		[mm]	$\geq 250 \times 120 \times 330$
Minimum thickness of member	$h_{\min} =$	[mm]	120

**Table 10.13.2: Installation parameters**

Anchor size		W-UR 8	W-UR 10	
Drill hole diameter	$d_0$	[mm]	8	10
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45	10.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80	80
Drill method		[-]	Rotary drilling	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5	10.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100	100

**Table 10.13.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	W-UR 10	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70	70
Hollow brick Blocchi Leggeri, $f_b \geq 6 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.9	0.3
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.6	0.3
Characteristic resistance $F_{Rk}$				
Partial safety factor	$\gamma_{Mm}$ <sup>2)</sup>	[-]	2.5	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Hollow brick Blocchi Leggeri**

Brick data, installation parameters,  
characteristic resistance

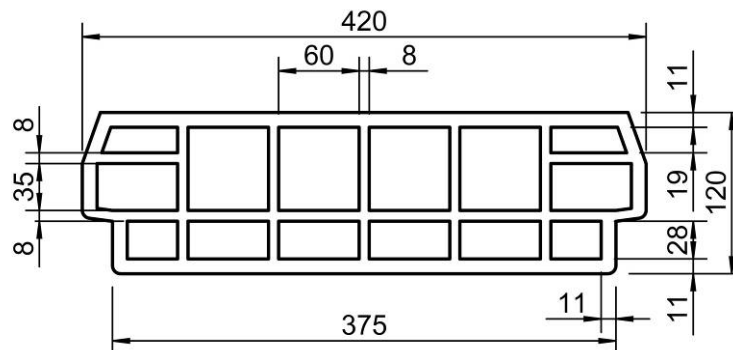
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**Hollow brick for ceiling: Blocchi per solaio a travetti****Table 10.14.1: Brick data**

Description of brick		AC	Blocchi per solaio a travetti
Type of brick			Hollow brick for ceiling
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.6
Standard, approval			EN 771-1
Producer of brick			Wienerberger Tacconi s.r.l. Via Ringhiera 1 I-40020 Mordano (Bologna) fraz. Bubano Italy, Werk Terni
Measurement		[mm]	$\geq 420 \times 120 \times 250$
Minimum thickness of member	$h_{\min} =$	[mm]	120

**Table 10.14.2: Installation parameters**

Anchor size		W-UR 8	W-UR 10	
Drill hole diameter	$d_0$	[mm]	8	10
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45	10.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80	80
Drill method		[-]	Rotary drilling	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5	10.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100	100

**Table 10.14.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	W-UR 10	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70	70
Hollow brick for ceiling Blocchi per solaio a travetti, $f_b \geq 10 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	1.2	0.9
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.9	0.6
Hollow brick for ceiling Blocchi per solaio a travetti, $f_b \geq 14 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	1.5	1.2
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	1.2	0.9
Partial safety factor	$\gamma_{Mm}$ <sup>2)</sup>	[-]	2.5	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Hollow brick for ceiling Blocchi per solaio a travetti**

Brick data, installation parameters,  
characteristic resistance

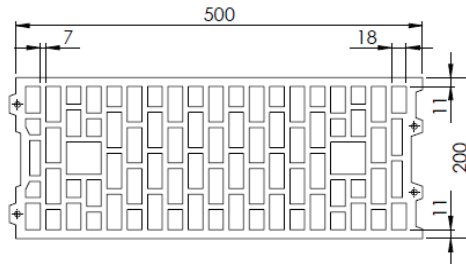
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**Base material hollow masonry: Hollow brick POROTHERM MURBRIC T20 and R20****Table 10.15.1: Brick data**

Brick data		AS	POROTHERM MURBRIC T20 and R20
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.7
Standard, approval			EN 771-1
Producer of brick			e.g. Wienerberger SAS 8, Rue du Canal - Achenheim 67087 Strasbourg, France
Measurement		[mm]	T20: 500x200x240 R20: 500x200x249
Minimum thickness of member	$h_{min} =$	[mm]	200

**Table 10.15.2: Installation parameters**

Anchor size			W-UR 8
Drill hole diameter	$d_0$	[mm]	8
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5
Minimum edge distance	$c_{min} \geq$	[mm]	100

**Table 10.15.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size			W-UR 8
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	<b>70</b>
<b>Hollow brick</b> <b>POROTHERM MURBRIC T20 and R20,</b> $f_b \geq 6 \text{ N/mm}^2$ Characteristic resistance $F_{Rk}$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	0.3
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.3
<b>Hollow brick</b> <b>POROTHERM MURBRIC T20 and R20,</b> $f_b \geq 8 \text{ N/mm}^2$ Characteristic resistance $F_{Rk}$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	0.4
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.4
<b>Hollow brick</b> <b>POROTHERM MURBRIC T20 and R20,</b> $f_b \geq 12 \text{ N/mm}^2$ Characteristic resistance $F_{Rk}$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	0.6
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.6
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	2.5

<sup>1)</sup> Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

<sup>2)</sup> In absence of other national regulations

<sup>3)</sup> Maximum long term temperature

<sup>4)</sup> Maximum short term temperature

**Würth Plastic Anchor W-UR**

**Hollow brick: POROTHERM MURBRIC T20 and R20**  
Brick data, installation parameters,  
characteristic resistance

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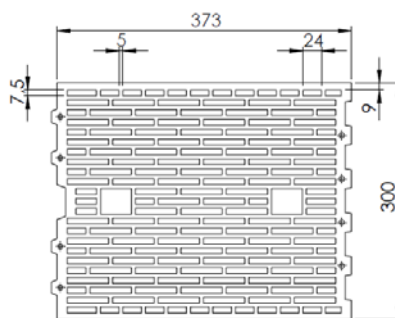
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**Base material hollow masonry: Hollow brick POROTHERM T30, POROTHERM R30****Table 10.16.1: Brick data**

Brick data		AG	POROTHERM T30 and R30
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.7
Standard, approval			EN 771-1
Producer of brick			Wienerberger SAS 8, Rue du Canal - Achenheim 67087 Strasbourg France
Measurement		[mm]	T30: 373x300x249 R30: 373x300x250
Minimum thickness of member	$h_{min} =$	[mm]	300

**Table 10.16.2: Installation parameters**

Anchor size		W-UR 8	
Drill hole diameter	$d_0$	[mm]	8
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5
Minimum edge distance	$c_{min} \geq$	[mm]	100

**Table 10.16.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	<b>70</b>
Hollow brick POROTHERM R30, Hollow brick POROTHERM T30, $f_b \geq 6 \text{ N/mm}^2$ Characteristic resistance $F_{Rk}$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.4
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.3
Hollow brick POROTHERM R30, Hollow brick POROTHERM T30, $f_b \geq 8 \text{ N/mm}^2$ Characteristic resistance $F_{Rk}$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.5
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.4
Partial safety factor	$\gamma_{Mm}^2)$	[-]	2.5

- 1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.
- 2) In absence of other national regulations
- 3) Maximum long term temperature
- 4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Hollow brick: POROTHERM R30 and T30**

Brick data, installation parameters,  
characteristic resistance

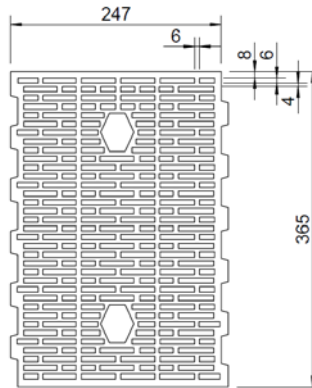
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**Base material hollow masonry: Hollow brick UNIPOR WS11 CORISO****Table 10.17.1: Brick data**

Brick data		W7	UNIPOR WS11 CORISO
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.85
Standard, approval			EN 771-1, Z-17.1-1011, DIN V 105-2
Producer of brick			UNIPOR Ziegel Marketing GmbH Landsberger Straße 392 D-81241 München
Measurement		[mm]	12DF ( $\geq 247 \times 365 \times 249$ )
Minimum thickness of member	$h_{\min} =$	[mm]	365

**Table 10.17.2: Installation parameters**

Anchor size		W-UR 8	
Drill hole diameter	$d_0$	[mm]	8
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100

**Table 10.17.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
<b>Hollow brick</b> <b>UNIPOR WS11 CORISO, <math>f_b \geq 10 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.9
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.75
Partial safety factor	$\gamma_{Mm}^2)$	[-]	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Hollow brick: UNIPOR WS11 CORISO**

Brick data, installation parameters,  
characteristic resistance

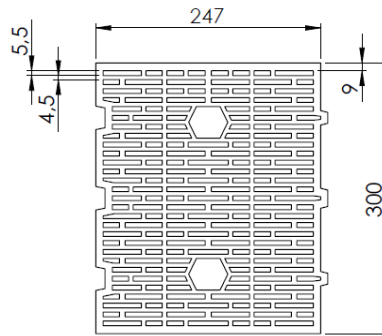
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**Base material hollow masonry: Hollow brick UNIPOR WS14 and UNIPOR WS12 CORISO****Table 10.18.1: Brick data**

Brick data		AM	UNIPOR WS14 and UNIPOR WS12 CORISO
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.8
Standard, approval			EN 771-1, Z-17.1-883, DIN V 105-2
Producer of brick			UNIPOR Ziegel Marketing GmbH Landsberger Straße 392 D-81241 München
Measurement		[mm]	10DF ( $\geq 247 \times 300 \times 249$ )
Minimum thickness of member	$h_{\min} =$	[mm]	300

**Table 10.18.2: Installation parameters**

Anchor size		W-UR 8	
Drill hole diameter	$d_0$	[mm]	8
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100

**Table 10.18.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Hollow brick UNIPOR WS14 and UNIPOR WS12 CORISO, $f_b \geq 10 \text{ N/mm}^2$ Characteristic resistance $F_{Rk}$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	0.6
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.6
Hollow brick UNIPOR WS14 and UNIPOR WS12 CORISO, $f_b \geq 12 \text{ N/mm}^2$ Characteristic resistance $F_{Rk}$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	0.75
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.75
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	2.5

<sup>1)</sup> Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

<sup>2)</sup> In absence of other national regulations

<sup>3)</sup> Maximum long term temperature

<sup>4)</sup> Maximum short term temperature

**Würth Plastic Anchor W-UR****Hollow brick: UNIPOR WS14 and  
UNIPOR WS12 CORISO**

Brick data, installation parameters,  
characteristic resistance

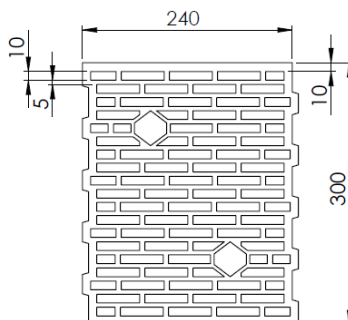
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**Base material hollow masonry: Hollow brick UNIPOR W14****Table 10.19.1: Brick data**

Brick data		AL	UNIPOR W14
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.7
Standard, approval			W14-Plan: EN 771-1, Z-17.1-679, DIN V 105-2 W14-Block: EN 771-1, Z-17.1-636, DIN V 105-2
Producer of brick			UNIPOR Ziegel Marketing GmbH Landsberger Straße 392 D-81241 München
Measurement		[mm]	W14-Plan: 10DF ( $\geq 240 \times 300 \times 249$ ) W14-Block: 10DF ( $\geq 240 \times 300 \times 238$ )
Minimum thickness of member	$h_{\min} =$	[mm]	300

**Table 10.19.2: Installation parameters**

Anchor size		W-UR 8	
Drill hole diameter	$d_0$	[mm]	8
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100

**Table 10.19.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Hollow brick UNIPOR W14, $f_b \geq 6 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.4
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.4
Characteristic resistance $F_{Rk}$			
Partial safety factor	$\gamma_{Mm}^2)$	[-]	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

- 2) In absence of other national regulations  
3) Maximum long term temperature  
4) Maximum short term temperature

**Würth Plastic Anchor W-UR**

**Hollow brick: UNIPOR W14**  
Brick data, installation parameters,  
characteristic resistance

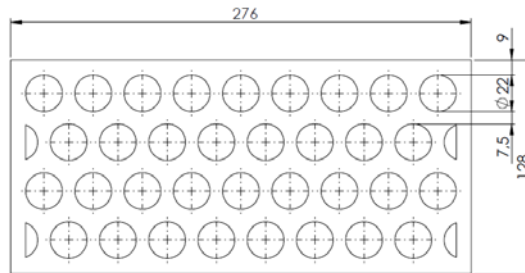
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**Base material hollow masonry: Hollow brick Ladrillo P NV R150****Table 10.20.1: Brick data**

Brick data		AN	Hollow brick Ladrillo P NV R150
Type of brick			Hollow brick Ladrillo P NV R150
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	1.2
Standard, approval			EN 771-1
Producer of brick			Ceramica La Corona, S.A. Carreta de Caldes, km 8, 9 08420 Canovelles, Spain
Measurement		[mm]	$\geq 276 \times 128 \times 95$
Minimum thickness of member	$h_{\min} =$	[mm]	128

**Table 10.20.2: Installation parameters**

Anchor size			W-UR 8
Drill hole diameter	$d_0$	[mm]	8
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100

**Table 10.20.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size			W-UR 8
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	<b>70</b>
Hollow brick Ladrillo P NV R150, $f_b \geq 12 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.6
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.5
Hollow brick Ladrillo P NV R150, $f_b \geq 20 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	1.2
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.9
Hollow brick Ladrillo P NV R150, $f_b \geq 28 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	1.5
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	1.2
Hollow brick Ladrillo P NV R150, $f_b \geq 36 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	2.0
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	1.5
Partial safety factor	$\gamma_{Mm}^2)$	[-]	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Hollow brick: Ladrillo P NV R150**

Brick data, installation parameters,  
characteristic resistance

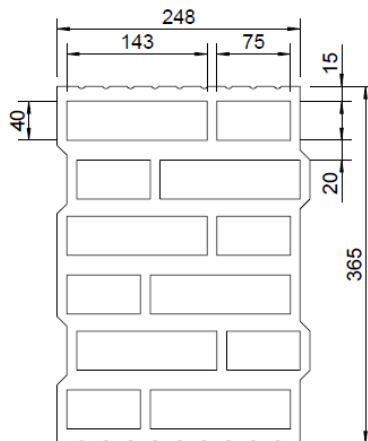
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**Base material hollow masonry: Hollow brick ThermoPlan MZ8****Table 10.21.1: Brick data**

Brick data		W3	ThermoPlan MZ8
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.6
Standard, approval			EN 771-1, Z-17.1-906
Producer of brick			Mein Ziegelhaus GmbH & Co. KG Märkerstraße 44 D-63755 Alzenau
Measurement		[mm]	$\geq 12DF (\geq 248 \times 365 \times 249)$
Minimum thickness of member	$h_{\min} =$	[mm]	365

**Table 10.21.2: Installation parameters**

Anchor size		W-UR 8	
Drill hole diameter	$d_0$	[mm]	8
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100

**Table 10.21.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	<b>70</b>
<b>Hollow brick ThermoPlan MZ8,</b> $f_b \geq 6 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	0.9
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.75
<b>Hollow brick ThermoPlan MZ8,</b> $f_b \geq 8 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	1.2
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.9
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	2.5

<sup>1)</sup> Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

<sup>2)</sup> In absence of other national regulations

<sup>3)</sup> Maximum long term temperature

<sup>4)</sup> Maximum short term temperature

**Würth Plastic Anchor W-UR****Hollow brick: ThermoPlan MZ8**

Brick data, installation parameters,  
characteristic resistance

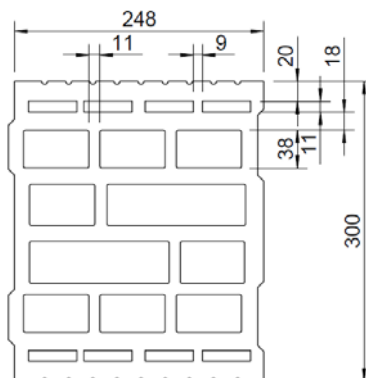
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**Base material hollow masonry: Hollow brick ThermoPlan MZ10****Table 10.22.1: Brick data**

Brick data		WZ1	ThermoPlan MZ10
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.75
Standard, approval			EN 771-1, Z-17.1-1015
Producer of brick			Mein Ziegelhaus GmbH & Co. KG Märkerstraße 44 D-63755 Alzenau
Measurement		[mm]	$\geq 10DF (\geq 248 \times 300 \times 249)$
Minimum thickness of member	$h_{\min} =$	[mm]	300

**Table 10.22.2: Installation parameters**

Anchor size		W-UR 8	
Drill hole diameter	$d_0$	[mm]	8
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100

**Table 10.22.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	<b>70</b>
Hollow brick ThermoPlan MZ10, $f_b \geq 8 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	2,0
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	1.5
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Hollow brick: ThermoPlan MZ10**

Brick data, installation parameters,  
characteristic resistance

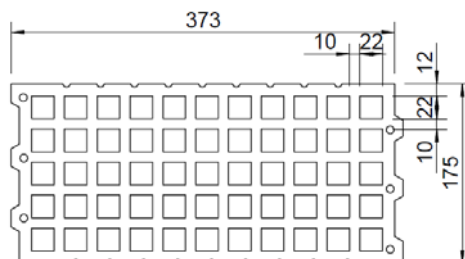
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**Base material hollow masonry: Hollow brick ThermoPlan TS<sup>2</sup>****Table 10.23.1: Brick data**

Brick data		W8	ThermoPlan TS <sup>2</sup>
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.9
Standard, approval			EN 771-1, Z-17.1-993
Producer of brick			Mein Ziegelhaus GmbH & Co. KG Märkerstraße 44 D-63755 Alzenau
Measurement		[mm]	$\geq 9DF (\geq 373 \times 175 \times 249)$
Minimum thickness of member	$h_{\min} =$	[mm]	175

**Table 10.23.2: Installation parameters**

Anchor size		W-UR 8	
Drill hole diameter	$d_0$	[mm]	8
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100

**Table 10.23.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	<b>70</b>
Hollow brick ThermoPlan TS <sup>2</sup> , $f_b \geq 6 \text{ N/mm}^2$	30°C <sup>3)</sup> / 50°C <sup>4)</sup>	[kN]	0,6
	50°C <sup>3)</sup> / 80°C <sup>4)</sup>	[kN]	0,4
Hollow brick ThermoPlan TS <sup>2</sup> , $f_b \geq 8 \text{ N/mm}^2$	30°C <sup>3)</sup> / 50°C <sup>4)</sup>	[kN]	0.75
	50°C <sup>3)</sup> / 80°C <sup>4)</sup>	[kN]	0.6
Hollow brick ThermoPlan TS <sup>2</sup> , $f_b \geq 10 \text{ N/mm}^2$	30°C <sup>3)</sup> / 50°C <sup>4)</sup>	[kN]	0.9
	50°C <sup>3)</sup> / 80°C <sup>4)</sup>	[kN]	0.75
Hollow brick ThermoPlan TS <sup>2</sup> , $f_b \geq 12 \text{ N/mm}^2$	30°C <sup>3)</sup> / 50°C <sup>4)</sup>	[kN]	1.2
	50°C <sup>3)</sup> / 80°C <sup>4)</sup>	[kN]	0.9
Hollow brick ThermoPlan TS <sup>2</sup> , $f_b \geq 20 \text{ N/mm}^2$	30°C <sup>3)</sup> / 50°C <sup>4)</sup>	[kN]	2.0
	50°C <sup>3)</sup> / 80°C <sup>4)</sup>	[kN]	1.5
Partial safety factor	$\gamma_{Mm}$ <sup>2)</sup>	[-]	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Hollow brick: ThermoPlan TS<sup>2</sup>**

Brick data, installation parameters,  
characteristic resistance

**Annex 36**

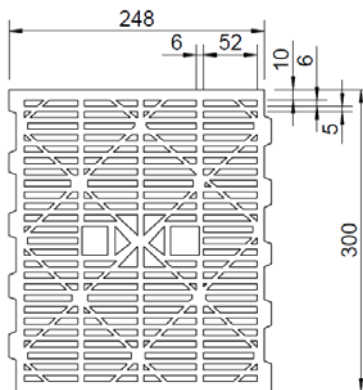
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**Base material hollow masonry: Hollow brick ThermoPlan TS 13****Table 10.24.1: Brick data**

Brick data		ThermoPlan TS 13
Type of brick	w20	Hollow brick
Bulk density	$\rho \geq$ [kg/dm <sup>3</sup> ]	0.75
Standard, approval		EN 771-1, Z-17.1-914
Producer of brick		Mein Ziegelhaus GmbH & Co. KG Märkerstraße 44 D-63755 Alzenau
Measurement	[mm]	$\geq 10DF (\geq 248 \times 300 \times 248)$
Minimum thickness of member	$h_{\min} =$ [mm]	300

**Table 10.24.2: Installation parameters**

Anchor size		W-UR 8
Drill hole diameter	$d_0$ [mm]	8
Cutting diameter of drill bit	$d_{\text{cut}} \leq$ [mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$ [mm]	80
Drill method	[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$ [mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	8.5
Minimum edge distance	$c_{\min} \geq$ [mm]	100

**Table 10.24.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8
Overall plastic anchor embedment depth	$h_{\text{nom}} =$ [mm]	<b>70</b>
<b>Hollow brick ThermoPlan TS 13,</b> $f_b \geq 8 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$ [kN]	0.6
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$ [kN]	0.6
<b>Hollow brick ThermoPlan TS 13,</b> $f_b \geq 10 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$ [kN]	0,75
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$ [kN]	0,75
Partial safety factor	$\gamma_{Mm}^2)$ [-]	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Hollow brick: ThermoPlan TS 13**

Brick data, installation parameters,  
characteristic resistance

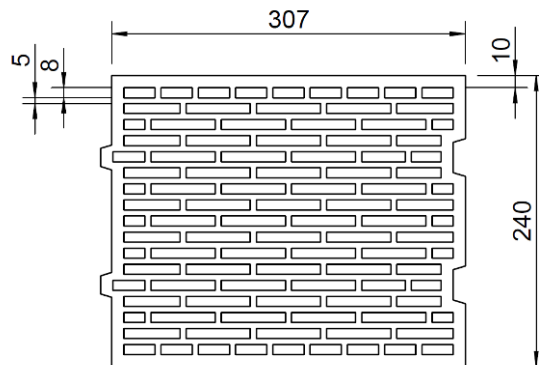
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**Base material hollow masonry: Hollow brick THERMOPOR ISO-PD Plus Objektziegel****Table 10.25.1: Brick data**

Brick data		W14	THERMOPOR ISO-PD Plus
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.7
Standard, approval			EN 771-1, Z-17.1-840
Producer of brick			Thermopor Ziegel-Kontor Ulm GmbH Olgastraße 94 D-89073 Ulm
Measurement		[mm]	$\geq 307 \times 240 \times 249$
Minimum thickness of member	$h_{\min} =$	[mm]	240

**Table 10.25.2: Installation parameters**

Anchor size		W-UR 8	
Drill hole diameter	$d_0$	[mm]	8
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100

**Table 10.25.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	<b>70</b>
<b>THERMOPOR ISO-PD Plus Objektziegel, <math>f_b \geq 6 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	0.5
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.4
<b>THERMOPOR ISO-PD Plus Objektziegel, <math>f_b \geq 8 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	0.6
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.6
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Hollow brick: THERMOPOR ISO-PD Plus Objektziegel**

Brick data, installation parameters,  
characteristic resistance

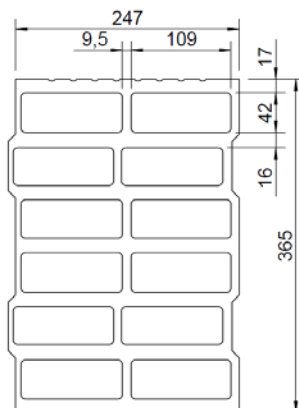
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**Base material hollow masonry: Hollow brick THERMOPOR TV 7-Plan****Table 10.26.1: Brick data**

Brick data		W18	THERMOPOR TV 7-Plan
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.5
Standard, approval			EN 771-1, Z-17.1-1005
Producer of brick			Thermopor Ziegel-Kontor Ulm GmbH Olgastraße 94 D-89073 Ulm
Measurement		[mm]	$\geq 247 \times 365 \times 249$
Minimum thickness of member	$h_{\min} =$	[mm]	365

**Table 10.26.2: Installation parameters**

Anchor size		W-UR 8	
Drill hole diameter	$d_0$	[mm]	8
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100

**Table 10.26.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

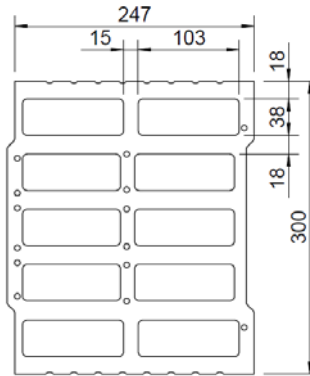
Anchor size		W-UR 8	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	<b>70</b>
<b>Hollow brick THERMOPOR TV 7-Plan, <math>f_b \geq 4 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.9
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.9
Partial safety factor	$\gamma_{Mm}^2)$	[-]	2.5

- 1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.
- 2) In absence of other national regulations
- 3) Maximum long term temperature
- 4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Hollow brick: THERMOPOR TV 7-Plan**Brick data, installation parameters,  
characteristic resistance**Annex 39**of European  
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**Base material hollow masonry: Hollow brick THERMOPOR TV 9-Plan****Table 10.27.1: Brick data**

Brick data		W19	THERMOPOR TV 9-Plan
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.65
Standard, approval			EN 771-1, Z-17.1-1006
Producer of brick			Thermopor Ziegel-Kontor Ulm GmbH Olgastraße 94 D-89073 Ulm
Measurement		[mm]	$\geq 247 \times 300 \times 249$
Minimum thickness of member	$h_{\min} =$	[mm]	300

**Table 10.27.2: Installation parameters**

Anchor size		W-UR 8	
Drill hole diameter	$d_0$	[mm]	8
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100

**Table 10.27.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	<b>70</b>
<b>Hollow brick THERMOPOR TV 9-Plan, <math>f_b \geq 4 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.75
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.75
<b>Hollow brick THERMOPOR TV 9-Plan, <math>f_b \geq 6 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.9
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.9
<b>Hollow brick THERMOPOR TV 9-Plan, <math>f_b \geq 8 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	1.5
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	1.5
Partial safety factor	$\gamma_{Mm}^2)$	[-]	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Hollow brick: THERMOPOR TV 9-Plan**

Brick data, installation parameters,  
characteristic resistance

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**Base material solid masonry, sand-lime solid brick KS, NF****Table 10.28.1: Brick data**

Description of brick		KS	
Type of brick		Sand-lime solid brick	
Bulk density	$\rho \geq$ [kg/dm <sup>3</sup> ]	2.0	
Standard, approval		DIN 106; EN 771-2	
Producer of brick		-	
Format (measurement)	[mm]	$\geq$ NF ( $\geq$ 240x115x71)	
Minimum thickness of member	$h_{min} =$ [mm]	115	

**Table 10.28.2: Installation parameters**

Anchor size		W-UR 8		W-UR 10
Drill hole diameter	$d_0$ [mm]	8		10
Cutting diameter of drill bit	$d_{cut} \leq$ [mm]	8.45		10.45
Depth of drill hole to deepest point	$h_1 \geq$ [mm]	60	80	80
Drill method	[-]	Hammer drilling		Hammer drilling
Overall plastic anchor embedment depth	$h_{nom} \geq$ [mm]	50	70	70
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	8.5		10.5
Minimum edge distance	$c_{min} \geq$ [mm]	100		100

**Table 10.28.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8		W-UR 10
Overall plastic anchor embedment depth	$h_{nom} \geq$ [mm]	<b>50</b>	<b>70</b>	<b>70</b>
<b>Sand-lime solid brick KS,</b> $f_b \geq 10 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$ [kN]	1.5	1.5	2.0
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$ [kN]	1.5	1.5	1.5
<b>Sand-lime solid brick KS,</b> $f_b \geq 20 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$ [kN]	2.5	2.5	3.0
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$ [kN]	2.0	2.5	2.5
<b>Sand-lime solid brick KS,</b> $f_b \geq 28 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$ [kN]	3.5	3.5	4.5
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$ [kN]	3.0	3.5	3.5
Partial safety factor	$\gamma_{Mm}$ <sup>2)</sup> [-]	2.5		2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Sand-lime solid brick KS, NF**

Brick data, installation parameters,  
characteristic resistance

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**Base material solid masonry, sand-lime solid brick Silka XL Basic, Silka XL Plus****Table 10.29.1: Brick data**

Description of brick		W12		Silka XL Basic, Silka XL Plus	
Type of brick				Sand-lime solid brick	
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]		2.0	
Standard, approval				DIN V 106; EN 771-2, Z-17.1-997	
Producer of brick				Xella Deutschland GmbH Dr.-Hammacher-Str. 49 D-47119 Duisburg	
Format (measurement)		[mm]		$\geq 248 \times 175 \times 498$	
Minimum thickness of member	$h_{\min} =$	[mm]		175	

**Table 10.29.2: Installation parameters**

Anchor size			W-UR 8	W-UR 10
Drill hole diameter	$d_0$	[mm]	8	10
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45	10.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80	80
Drill method		[-]	Hammer drilling	Hammer drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$	[mm]	70	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5	10.5
Minimum edge distance	$c_{\min} \geq$	[mm]	50	50

**Table 10.29.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size			W-UR 8	W-UR 10
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$	[mm]	<b>70</b>	<b>70</b>
<b>Sand-lime solid brick Silka XL Basic, Silka XL Plus, <math>f_b \geq 10 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	1.5	2.5
	Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	1.5
<b>Sand-lime solid brick Silka XL Basic, Silka XL Plus, <math>f_b \geq 20 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	2.5	3.5
	Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	2.5
<b>Sand-lime solid brick Silka XL Basic, Silka XL Plus, <math>f_b \geq 28 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	3.5	4,5
	Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	3.5
Partial safety factor	$\gamma_{Mm}^2)$	[-]	2.5	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Sand-lime solid brick Silka XL Basic, Silka XL Plus**

Brick data, installation parameters,  
characteristic resistance

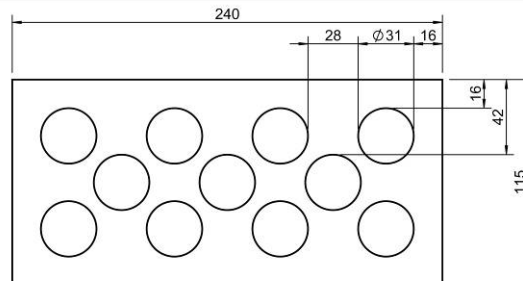
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**Base material hollow masonry, sand-lime perforated brick KS L, 2DF****Table 10.30.1: Brick data**

Description of brick		L = Y	KS L
Type of brick			Sand-lime perforated brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	1.6
Standard, approval			DIN 106; EN 771-2
Producer of brick			-
Format (measurement)		[mm]	$\geq 2DF (\geq 240 \times 115 \times 113)$
Minimum thickness of member	$h_{\min} =$	[mm]	115

**Table 10.30.2: Installation parameters**

Anchor size		W-UR 8	W-UR 10
Drill hole diameter	$d_0$ [mm]	8	10
Cutting diameter of drill bit	$d_{\text{cut}} \leq$ [mm]	8.45	10.45
Depth of drill hole to deepest point	$h_1 \geq$ [mm]	60	80
Drill method	[-]	Rotary drilling	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$ [mm]	50	70
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	8.5	10.5

**Table 10.30.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	W-UR 10
Overall plastic anchor embedment depth	$h_{\text{nom}}$ [mm]	$\geq 50$ <sup>5)</sup>	<b>= 70</b>
<b>Sand-lime perforated brick KS L,</b> $f_b \geq 6 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$ [kN]	0.6	0.9
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$ [kN]	0.5	0.9
<b>Sand-lime perforated brick KS L,</b> $f_b \geq 8 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$ [kN]	0.9	1.2
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$ [kN]	0.6	1.2
<b>Sand-lime perforated brick KS L,</b> $f_b \geq 10 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$ [kN]	0.9	1.5
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$ [kN]	0.9	1.5
<b>Sand-lime perforated brick KS L,</b> $f_b \geq 12 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$ [kN]	1.2	2.0
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$ [kN]	0.9	2.0
<b>Sand-lime perforated brick KS L,</b> $f_b \geq 16 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$ [kN]	1.5	2.5
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$ [kN]	1.2	2.5
Partial safety factor	$\gamma_{Mm}$ <sup>2)</sup> [-]	2.5	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

5) The given values  $F_{Rk}$  in this column are valid for the embedment depth range  $50 \text{ mm} \leq h_{\text{nom}} < 70 \text{ mm}$  (see Annex 5, Table 3).  
For Plastic anchors W-UR 8 set variable in this range no additional job site tests have necessarily to be performed.

**Würth Plastic Anchor W-UR****Sand-lime perforated brick KS L, 2DF**

Brick data, installation parameters,  
characteristic resistance

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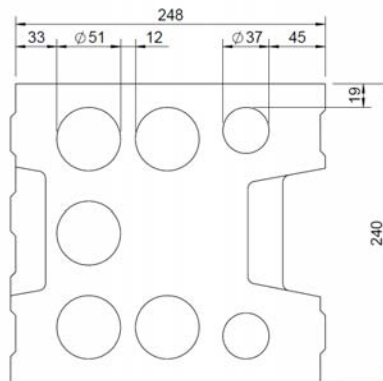
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**Base material hollow masonry, sand-lime perforated brick KS L, 8DF**

**Table 10.31.1: Brick data**

Description of brick		AK	KS L
Type of brick			Sand-lime perforated brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	1.4
Standard, approval			DIN 106; EN 771-2
Producer of brick			e.g. Xella Deutschland GmbH
Format (measurement)		[mm]	$\geq 8DF (\geq 248 \times 240 \times 238)$
Minimum thickness of member	$h_{min} =$	[mm]	240



**Table 10.31.2: Installation parameters**

Anchor size		W-UR 8	W-UR 10
Drill hole diameter	$d_0$	[mm]	8
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5
Minimum edge distance	$c_{min} \geq$	[mm]	60

**Table 10.31.3: Characteristic resistance  $F_{Rk}^{1)}$  in [kN] for single anchor**

Anchor size		W-UR 8	W-UR 10
Sand-lime perforated brick KS L, $f_b \geq 6 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$	[kN]	0.9
	Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3 / 80^\circ\text{C}^4$	[kN]
Sand-lime perforated brick KS L, $f_b \geq 8 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$	[kN]	1.2
	Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3 / 80^\circ\text{C}^4$	[kN]
Sand-lime perforated brick KS L, $f_b \geq 10 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$	[kN]	1.5
	Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3 / 80^\circ\text{C}^4$	[kN]
Sand-lime perforated brick KS L, $f_b \geq 12 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$	[kN]	1.5
	Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3 / 80^\circ\text{C}^4$	[kN]
Sand-lime perforated brick KS L, $f_b \geq 16 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$	[kN]	2.0
	Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3 / 80^\circ\text{C}^4$	[kN]
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
 The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

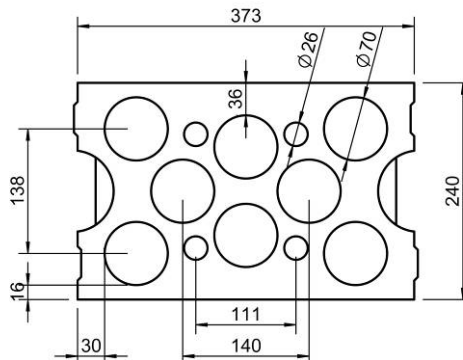
4) Maximum short term temperature

<b>Würth Plastic Anchor W-UR</b>	<b>Annex 44</b> of European Technical Approval <b>ETA-08/0190</b>
<b>Sand-lime perforated brick KS L, 8DF</b> Brick data, installation parameters, characteristic resistance	



**Base material hollow masonry, sand-lime perforated brick KS L, 12DF****Table 10.32.1: Brick data**

Description of brick		c	KS L
Type of brick			Sand-lime perforated brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	1.4
Standard, approval			DIN 106; EN 771-2
Producer of brick			-
Format (measurement)		[mm]	$\geq 12DF (\geq 373 \times 240 \times 238)$
Minimum thickness of member	$h_{\min} =$	[mm]	240

**Table 10.32.2: Installation parameters**

Anchor size		W-UR 8	W-UR 10
Drill hole diameter	$d_0$ [mm]	8	10
Cutting diameter of drill bit	$d_{\text{cut}} \leq$ [mm]	8.45	10.45
Depth of drill hole to deepest point	$h_1 \geq$ [mm]	60   80	80
Drill method	[-]	Rotary drilling	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$ [mm]	50   70	70
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	8.5	10.5
Minimum edge distance	$c_{\min} \geq$ [mm]	100	100

**Table 10.32.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	W-UR 10
Overall plastic anchor embedment depth	$h_{\text{nom}}$ [mm]	$50 \text{ mm} \leq h_{\text{nom}} \leq 70 \text{ mm}$ <sup>5)</sup>	$= 70$ <sup>5)</sup>
<b>Sand-lime perforated brick KS L, <math>f_b \geq 6 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$ [kN]	0.6	0.9
	Characteristic resistance $F_{Rk}$ $50^\circ\text{C}^3 / 80^\circ\text{C}^4$ [kN]	0.5	0.6
<b>Sand-lime perforated brick KS L, <math>f_b \geq 8 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$ [kN]	0.9	1.2
	Characteristic resistance $F_{Rk}$ $50^\circ\text{C}^3 / 80^\circ\text{C}^4$ [kN]	0.6	0.75
<b>Sand-lime perforated brick KS L, <math>f_b \geq 10 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$ [kN]	0.9	1.5
	Characteristic resistance $F_{Rk}$ $50^\circ\text{C}^3 / 80^\circ\text{C}^4$ [kN]	0.6	0.9
<b>Sand-lime perforated brick KS L, <math>f_b \geq 12 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$ [kN]	1.2	1.5
	Characteristic resistance $F_{Rk}$ $50^\circ\text{C}^3 / 80^\circ\text{C}^4$ [kN]	0.9	1.2
<b>Sand-lime perforated brick KS L, <math>f_b \geq 16 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$ [kN]	1.5	2.0
	Characteristic resistance $F_{Rk}$ $50^\circ\text{C}^3 / 80^\circ\text{C}^4$ [kN]	1.2	1.5
Partial safety factor	$\gamma_{Mm}$ <sup>2)</sup> [-]	2.5	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

5) The influence of  $h_{\text{nom}} > 70 \text{ mm}$  has to be detected by job site tests according 4.4.

**Würth Plastic Anchor W-UR****Sand-lime perforated brick KS L, 12DF**

Brick data, installation parameters,  
characteristic resistance

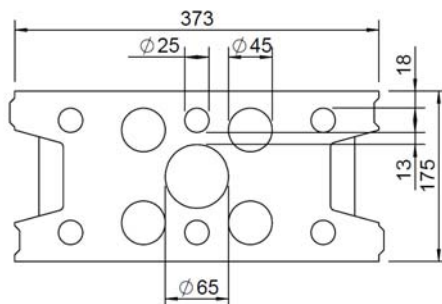
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**Base material hollow masonry, sand-lime perforated brick KS L, 9DF****Table 10.33.1: Brick data**

Description of brick		w <sub>9</sub>	KS L
Type of brick			Sand-lime perforated brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	1.4
Standard, approval			DIN 106; EN 771-2
Producer of brick			Xella Deutschland GmbH Dr.-Hammacher-Str.49 D-47119 Duisburg
Format (measurement)		[mm]	$\geq 9DF (\geq 373 \times 175 \times 249)$
Minimum thickness of member	$h_{\min} =$	[mm]	175

**Table 10.33.2: Installation parameters**

Anchor size			W-UR 8
Drill hole diameter	$d_0$	[mm]	8
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100

**Table 10.33.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size			W-UR 8
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	<b>70</b>
<b>Sand-lime perforated brick KS L,</b> <b><math>f_b \geq 6 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.6
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.4
<b>Sand-lime perforated brick KS L,</b> <b><math>f_b \geq 8 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.75
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.6
<b>Sand-lime perforated brick KS L,</b> <b><math>f_b \geq 10 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.9
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.75
<b>Sand-lime perforated brick KS L,</b> <b><math>f_b \geq 12 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	1.2
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.9
<b>Sand-lime perforated brick KS L,</b> <b><math>f_b \geq 20 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	2.0
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	1.5
Partial safety factor	$\gamma_{Mm}^2)$	[-]	2.5

<sup>1)</sup> Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

<sup>2)</sup> In absence of other national regulations

<sup>3)</sup> Maximum long term temperature

<sup>4)</sup> Maximum short term temperature

**Würth Plastic Anchor W-UR****Sand-lime perforated brick KS L, 9DF**

Brick data, installation parameters,  
characteristic resistance

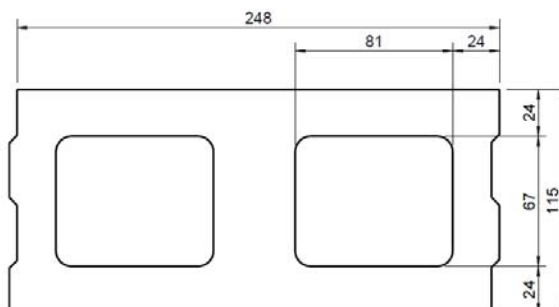
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**Base material hollow masonry, sand-lime perforated brick KS-NT, 4DF****Table 10.34.1: Brick data**

Description of brick		w11	KS-NT
Type of brick			Sand-lime perforated brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	1.2
Standard, approval			P-1109/884/07-MPA BS
Producer of brick			BMO KS-Vertrieb Bielefeld-Münster-Osnabrück GmbH & Co. KG Averdiekstr. 9; D-49078 Osnabrück
Format (measurement)		[mm]	$\geq 4DF (\geq 249 \times 115 \times 248)$
Minimum thickness of member	$h_{min} =$	[mm]	115

**Table 10.34.2: Installation parameters**

Anchor size		W-UR 8	
Drill hole diameter	$d_0$	[mm]	8
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5
Minimum edge distance	$c_{min} \geq$	[mm]	100

**Table 10.34.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	<b>70</b>
<b>Sand-lime perforated brick KS-NT,</b> $f_b \geq 12 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	1.5
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	1.2
<b>Sand-lime perforated brick KS-NT,</b> $f_b \geq 20 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	2.5
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	2
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	2.5

- <sup>1)</sup> Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.
- <sup>2)</sup> In absence of other national regulations
- <sup>3)</sup> Maximum long term temperature
- <sup>4)</sup> Maximum short term temperature

**Würth Plastic Anchor W-UR****Sand-lime perforated brick KS-NT, 4DF**

Brick data, installation parameters,  
characteristic resistance

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**Base material solid masonry, Concrete solid block Vbn, NF****Table 10.35.1: Brick data**

Description of brick		ov	Vbn
Type of brick			Concrete solid block
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	2.0
Standard, approval			DIN 18153; EN 771-3
Producer of brick			-
Format (measurement)		[mm]	$\geq$ NF ( $\geq$ 240x115x71)
Minimum thickness of member	$h_{\min} =$	[mm]	115

**Table 10.35.2: Installation parameters**

Anchor size		W-UR 8	W-UR 10		
Drill hole diameter	$d_0$	[mm]	8	10	
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45	10.45	
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	60	80	80
Drill method		[-]	Hammer drilling	Hammer drilling	
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$	[mm]	50	70	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5	10.5	
Minimum edge distance	$c_{\min} \geq$	[mm]	100	100	

**Table 10.35.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	W-UR 10	
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$	[mm]	50	70
<b>Concrete solid block Vbn,</b> $f_b \geq 10 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$	[kN]	1.5	2.0
	$50^\circ\text{C}^3 / 80^\circ\text{C}^4$	[kN]	1.5	2.0
<b>Concrete solid block Vbn,</b> $f_b \geq 20 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$	[kN]	2.5	3.0
	$50^\circ\text{C}^3 / 80^\circ\text{C}^4$	[kN]	2.5	3.0
<b>Concrete solid block Vbn,</b> $f_b \geq 28 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$	[kN]	3.5	4.5
	$50^\circ\text{C}^3 / 80^\circ\text{C}^4$	[kN]	3.5	4.5
Partial safety factor	$\gamma_{Mm}$ <sup>2)</sup>	[-]	2.5	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

- 2) In absence of other national regulations  
 3) Maximum long term temperature  
 4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Concrete solid block Vbn, NF**

Brick data, installation parameters,  
characteristic resistance

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**Base material solid masonry, Lightweight concrete solid brick V, NF****Table 10.36.1: Brick data**

Description of brick		AI	V
Type of brick			Lightweight concrete solid brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.9
Standard, approval			EN 771-3, DIN V 18152-100
Producer of brick			e.g. Bisoclassic V Bisotherm GmbH Eisenbahnstraße 12 D-56218 Mühlheim-Kärlich
Format (measurement)		[mm]	$\geq$ NF ( $\geq$ 240x115x71)
Minimum thickness of member	$h_{\min} =$	[mm]	115

**Table 10.36.2: Installation parameters**

Anchor size			W-UR 8
Drill hole diameter	$d_0$	[mm]	8
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Hammer drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100

**Table 10.36.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size			W-UR 8
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$	[mm]	<b>70</b>
<b>Lightweight concrete solid brick V2,</b> $f_b \geq 2 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.6
	Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]
<b>Lightweight concrete solid brick V4,</b> $f_b \geq 4 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	1.2
	Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	2.5

- 1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.
- 2) In absence of other national regulations
- 3) Maximum long term temperature
- 4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Lightweight concrete solid brick V, NF**Brick data, installation parameters,  
characteristic resistance**Annex 49**of European  
Technical Approval**ETA-08/0190**

**Base material solid masonry, Lightweight concrete solid brick V, NF****Table 10.37.1: Brick data**

Description of brick		AH	V
Type of brick			Lightweight concrete solid brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	1.0
Standard, approval			EN 771-3, DIN V 18152-100
Producer of brick			e.g. BasisBims, Bisotherm GmbH Eisenbahnstraße 12 D-56218 Mühlheim-Kärlich
Format (measurement)		[mm]	$\geq$ NF ( $\geq$ 240x115x71)
Minimum thickness of member	$h_{\min} =$	[mm]	115

**Table 10.37.2: Installation parameters**

Anchor size		W-UR 8
Drill hole diameter	$d_0$	[mm] 8
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm] 8.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm] 60 80
Drill method		[-] Hammer drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$	[mm] 50 70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm] 8.5
Minimum edge distance	$c_{\min} \geq$	[mm] 100

**Table 10.37.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$	[mm] 50 70
<b>Lightweight concrete solid brick V 2, <math>f_b \geq 2</math> N/mm<sup>2</sup></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN] 0.4 0.6
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN] 0.3 0.6
<b>Lightweight concrete solid brick V 4, <math>f_b \geq 4</math> N/mm<sup>2</sup></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN] 0.9 1.2
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN] 0.75 1.2
Partial safety factor	$\gamma_{Mm}^2)$	[-] 2.5

- 1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.
- 2) In absence of other national regulations
- 3) Maximum long term temperature
- 4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Lightweight concrete solid brick V, NF**Brick data, installation parameters,  
characteristic resistance**Annex 50**of European  
Technical Approval**ETA-08/0190**

**Base material: Lightweight concrete solid block Vbl****Table 10.38.1: Brick data**

Description of brick		LAC2	Vbl 2-0,6-24DF
Type of brick			Lightweight Aggregate Concrete
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.6
Standard, approval			DIN 18152
Producer of brick			e.g. Liapor Massive Wall LAC2 by: Liapor GmbH & Co. KG D-91352 Hallerndorf
Measurement		[mm]	$\geq 24DF$
Minimum thickness of member	$h_{min} =$	[mm]	365

**Table 10.38.2: Installation parameters**

Anchor size		W-UR 8	W-UR 10	
Drill hole diameter	$d_0$	[mm]	8	10
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	8.45	10.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80	80
Drill method		[-]	Hammer drilling	Hammer drilling
Overall plastic anchor embedment depth	$h_{nom} \geq$	[mm]	70	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5	10.5
Minimum edge distance	$c_{min} \geq$	[mm]	100	100

**Table 10.38.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	W-UR 10	
Overall plastic anchor embedment depth	$h_{nom} \geq$	[mm]	70	70
<b>Lightweight concrete solid block Vbl 2, <math>f_b \geq 2 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	1.2	1.5
	Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	1.2
Partial safety factor	$\gamma_{Mm}^2)$	[-]	2.5	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Lightweight concrete solid block Vbl**

Brick data, installation parameters,  
characteristic resistance

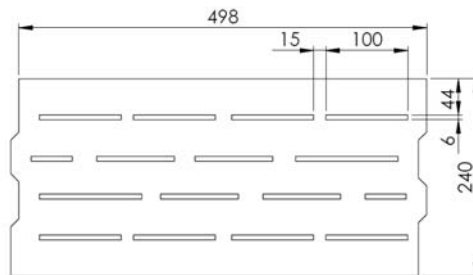
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**Base material: Lightweight concrete solid block Vbl****Table 10.39.1: Brick data**

Description of brick		Vbl 2-16DF	
Type of brick		Lightweight Aggregate Concrete	
Bulk density	$\rho \geq$ [kg/dm <sup>3</sup> ]	0.65	
Standard, approval		DIN 18152, Z-17.1-839	
Producer of brick		e.g. Liapor Compact by: Liapor GmbH & Co. KG D-91352 Hallerndorf  Meier Betonwerke GmbH Zur Schanze 2 92283 Lauterhofen	
Measurement	[mm]	$\geq 16DF (\geq 498 \times 240 \times 239)$	
Minimum thickness of member	$h_{min} =$ [mm]	240	

**Table 10.39.2: Installation parameters**

Anchor size			W-UR 8
Drill hole diameter	$d_0$ [mm]		8
Cutting diameter of drill bit	$d_{cut} \leq$ [mm]		8.45
Depth of drill hole to deepest point	$h_1 \geq$ [mm]		80
Drill method		[-]	Hammer drilling
Overall plastic anchor embedment depth	$h_{nom} \geq$ [mm]		70
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]		8.5
Minimum edge distance	$c_{min} \geq$ [mm]		100

**Table 10.39.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size			W-UR 8
Overall plastic anchor embedment depth	$h_{nom} \geq$ [mm]		70
Lightweight concrete solid block Vbl 2, $f_b \geq 2 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	1.2
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.9
Characteristic resistance $F_{Rk}$			
Partial safety factor	$\gamma_{Mm}^{2)}$ [-]		2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Lightweight concrete solid block Vbl**

Brick data, installation parameters,  
characteristic resistance

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**Base material: Concrete solid block Vbn****Table 10.40.1: Brick data**

Description of brick		LC16/18	Vbn 12-1,4-12DF
Type of brick			Concrete
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	1.4
Standard, approval			DIN 18153
Producer of brick			e.g. Liapor Element Wall LC16/18 by: Liapor GmbH & Co. KG D-91352 Hallerndorf
Measurement		[mm]	$\geq$ 12DF
Minimum thickness of member	$h_{\min} =$	[mm]	175

**Table 10.40.2: Installation parameters**

Anchor size		W-UR 8	W-UR 10	
Drill hole diameter	$d_0$	[mm]	8	10
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45	10.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80	80
Drill method		[-]	Hammer drilling	Hammer drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$	[mm]	70	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5	10.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100	100

**Table 10.40.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	W-UR 10	
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$	[mm]	70	70
<b>Concrete solid block Vbn 12,</b> $f_b \geq 12 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	3.5	3.5
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	3.5	3.5
Characteristic resistance $F_{Rk}$				
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	2.5	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

- 2) In absence of other national regulations  
 3) Maximum long term temperature  
 4) Maximum short term temperature

**Würth Plastic Anchor W-UR**

**Concrete solid block Vbn**  
 Brick data, installation parameters,  
 characteristic resistance

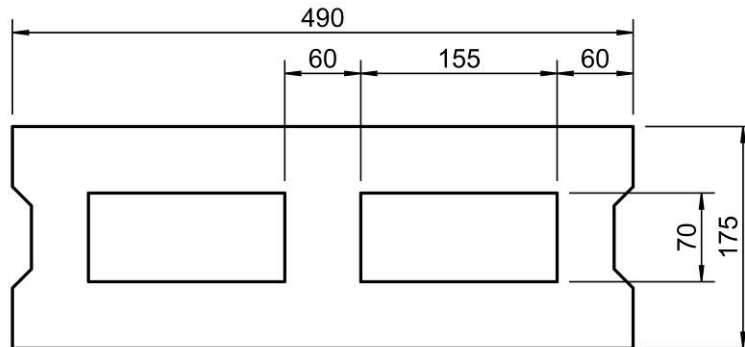
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**ETA-08/0190**

**Base material hollow brick lightweight concrete 1K Hbl****Table 10.41.1: Brick data**

Description of brick		1K Hbl
Type of brick		Hollow brick lightweight concrete 1K Hbl
Bulk density	$\rho \geq$ [kg/dm <sup>3</sup> ]	1.2
Standard, approval		DIN 18151; EN 771-3
Producer of brick		e.g. Stahl Betonwerk GmbH & Co. KG D-74547 Untermünkheim-Kupfer
Format (measurement)	[mm]	$\geq 12DF$ ( $\geq 490 \times 175 \times 238$ )
Minimum thickness of member	$h_{\min} =$ [mm]	175

**Table 10.41.2: Installation parameters**

Anchor size		W-UR 8	W-UR 10
Drill hole diameter	$d_0$ [mm]	8	10
Cutting diameter of drill bit	$d_{\text{cut}} \leq$ [mm]	8.45	10.45
Depth of drill hole to deepest point	$h_1 \geq$ [mm]	80	80
Drill method	[-]	Rotary drilling	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$ [mm]	70	70
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	8.5	10.5
Minimum edge distance	$c_{\min} \geq$ [mm]	100	100

**Table 10.41.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	W-UR 10
Overall plastic anchor embedment depth	$h_{\text{nom}} =$ [mm]	<b>70</b>	<b>70</b>
<b>Hollow brick lightweight concrete 1K Hbl, <math>f_b \geq 2 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$ [kN]	0.9	0.9
	Characteristic resistance $F_{Rk}$ $50^\circ\text{C}^3) / 80^\circ\text{C}^4)$ [kN]	0.9	0.75
<b>Hollow brick lightweight concrete 1K Hbl, <math>f_b \geq 4 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$ [kN]	2.0	2.0
	Characteristic resistance $F_{Rk}$ $50^\circ\text{C}^3) / 80^\circ\text{C}^4)$ [kN]	2.0	1.5
Partial safety factor	$\gamma_{Mm}$ <sup>2)</sup> [-]	2.5	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Hollow brick lightweight concrete 1K Hbl**

Brick data, installation parameters,  
characteristic resistance

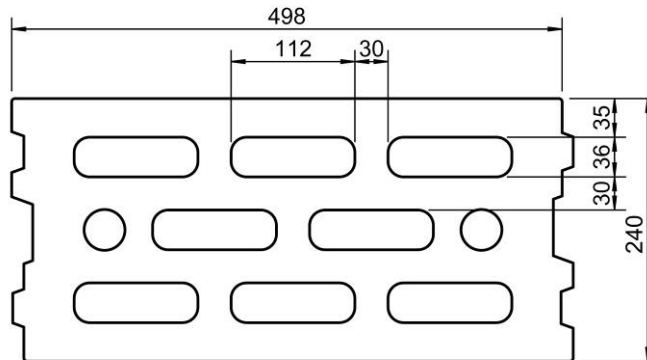
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**Base material hollow brick lightweight concrete 3K Hbl****Table 10.42.1: Brick data**

Description of brick		R3K	3K Hbl
Type of brick			Hollow brick lightweight concrete 3K Hbl
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.7
Standard, approval			DIN 18151; EN 771-3
Producer of brick			e.g. Heinzmann Baustoffe GmbH, Liapor GmbH & Co. KG
Format (measurement)		[mm]	$\geq 16DF (\geq 498 \times 240 \times 238)$
Minimum thickness of member	$h_{\min} =$	[mm]	240

**Table 10.42.2: Installation parameters**

Anchor size		W-UR 8	W-UR 10	
Drill hole diameter	$d_0$	[mm]	8	10
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45	10.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80	80
Drill method		[-]	Rotary drilling	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5	10.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100	100

**Table 10.42.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	W-UR 10	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70	70
<b>Hollow brick lightweight concrete 3K Hbl, <math>f_b \geq 2 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.6	0.5
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.4	0.3
<b>Hollow brick lightweight concrete 3K Hbl, <math>f_b \geq 4 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	1.2	0.9
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.9	0.6
<b>Hollow brick lightweight concrete 3K Hbl, <math>f_b \geq 6 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	1.5	1.5
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	1.2	0.9
Partial safety factor	$\gamma_{Mm}^2)$	[-]	2.5	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Hollow brick lightweight concrete 3K Hbl**

Brick data, installation parameters,  
characteristic resistance

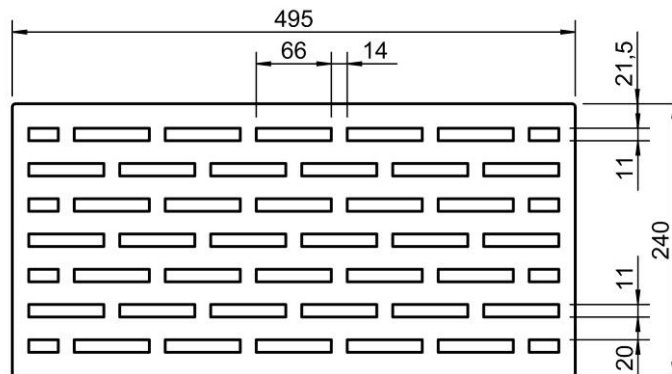
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**Base material hollow brick lightweight concrete: Liapor-Super-K****Table 10.43.1: Brick data**

Description of brick		<i>s<sub>7K</sub></i>	Liapor-Super-K
Type of brick			Hollow brick lightweight concrete 7K
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.8
Standard, approval			EN 771-3; Z-17.1-501
Producer of brick			Liapor GmbH & Co. KG D-91352 Hallerndorf
Format (measurement)		[mm]	$\geq 16DF$ ( $\geq 495 \times 240 \times 238$ )
Minimum thickness of member	$h_{\min} =$	[mm]	240

**Table 10.43.2: Installation parameters**

Anchor size		W-UR 8	W-UR 10	
Drill hole diameter	$d_0$	[mm]	8	10
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45	10.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80	80
Drill method		[-]	Rotary drilling	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5	10.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100	100

**Table 10.43.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	W-UR 10	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70	70
Hollow brick lightweight concrete Liapor-Super-K, $f_b \geq 2 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.75	0.9
	Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.6
Hollow brick lightweight concrete Liapor-Super-K, $f_b \geq 4 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	1.5	2.0
	Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	1.2
Partial safety factor	$\gamma_{Mm}^2)$	[-]	2.5	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Hollow brick lightweight concrete: Liapor-Super-K**

Brick data, installation parameters,  
characteristic resistance

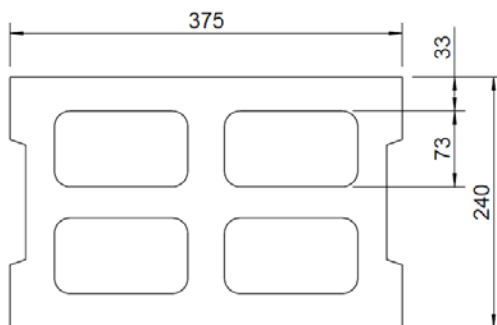
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**Base material hollow brick concrete 2K Hbn****Table 10.44.1: Brick data**

Description of brick		w <sub>6</sub>	2K Hbn
Type of brick			Hollow brick concrete
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	1.2
Standard, approval			DIN 18153
Producer of brick			e.g. Stark Betonwerk GmbH & Co. KG D-74547 Untermünkheim-Kupfer
Format (measurement)		[mm]	$\geq 12DF (\geq 375 \times 240 \times 238)$
Minimum thickness of member	$h_{\min} =$	[mm]	240

**Table 10.44.2: Installation parameters**

Anchor size			W-UR 8
Drill hole diameter	$d_0$	[mm]	8
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8,5
Minimum edge distance	$c_{\min} \geq$	[mm]	100

**Table 10.44.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size			W-UR 8
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	<b>70</b>
<b>Hollow brick concrete</b> <b>2K Hbn 2, <math>f_b \geq 2 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.75
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.6
<b>Hollow brick concrete</b> <b>2K Hbn 4, <math>f_b \geq 4 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	1.5
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	1.2
<b>Hollow brick concrete</b> <b>2K Hbn 6, <math>f_b \geq 6 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	2.0
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	1.5
<b>Hollow brick concrete</b> <b>2K Hbn 8, <math>f_b \geq 8 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	3.0
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	2.0
Partial safety factor	$\gamma_{Mm}^2)$	[-]	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR**

**Hollow brick concrete Hbn**  
Brick data, installation parameters,  
characteristic resistance

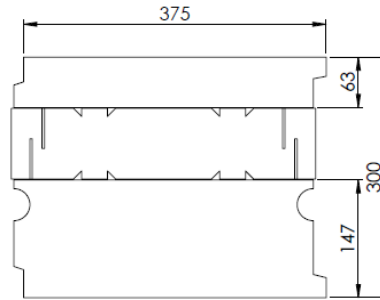
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**Base material hollow brick lightweight concrete: Gisoton WärmeDämmBlock****Table 10.45.1: Brick data**

Description of brick		AO	Gisoton WärmeDämmBlock
Type of brick			Hollow brick lightweight concrete
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.8
Standard, approval			Z-17.1-873
Producer of brick			Gisoton Wandsysteme Baustoffwerke Gebhart & Söhne GmbH & Co. Hochstraße 2 D-88317 Aichstetten
Format (measurement)		[mm]	$\geq 375 \times 300 \times 248$
Minimum thickness of member	$h_{\min} =$	[mm]	300

**Table 10.45.2: Installation parameters**

Anchor size			W-UR 8
Drill hole diameter	$d_0$	[mm]	8
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100

**Table 10.45.3: Characteristic resistance  $F_{RK}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size			W-UR 8
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	<b>70</b>
<b>Gisoton WärmeDämmBlock,</b> $f_b \geq 4 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	1.5
Characteristic resistance $F_{RK}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	1.5
Partial safety factor	$\gamma_{Mm}^2)$	[-]	2.5

1) Characteristic resistance  $F_{RK}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

- 2) In absence of other national regulations  
3) Maximum long term temperature  
4) Maximum short term temperature

**Würth Plastic Anchor W-UR**

**Gisoton WärmeDämmBlock**  
Brick data, installation parameters,  
characteristic resistance

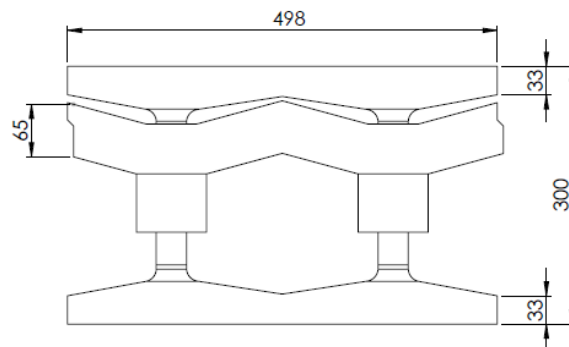
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**Base material hollow brick lightweight concrete: Gisoton Thermo Schall****Table 10.46.1: Brick data**

Description of brick		AP	Gisoton Thermo Schall
Type of brick			Hollow brick lightweight concrete
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.45
Standard, approval			Z-15.2-18
Producer of brick			Gisoton Wandsysteme Baustoffwerke Gebhart & Söhne GmbH & Co. Hochstraße 2 D-88317 Aichstetten
Format (measurement)		[mm]	$\geq 498 \times 300 \times 248$
Minimum thickness of member	$h_{\min} =$	[mm]	300

**Table 10.46.2: Installation parameters**

Anchor size			W-UR 8
Drill hole diameter	$d_0$	[mm]	8
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100

**Table 10.46.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size			W-UR 8
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Gisoton Thermo Schall, $f_b \geq 2 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	1.5
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	1.5
Partial safety factor	$\gamma_{Mm}$ <sup>2)</sup>	[-]	2.5

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Gisoton Thermo Schall**

Brick data, installation parameters,  
characteristic resistance

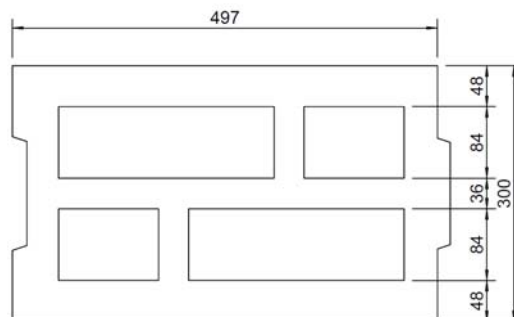
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**Base material hollow brick lightweight concrete: Bisomark<sup>TEC</sup>****Table 10.47.1: Brick data**

Description of brick		W23		Bisomark <sup>TEC</sup>	
Type of brick				Hollow brick lightweight concrete	
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]		0.4	
Standard, approval				Z-17.1-1026	
Producer of brick				Bisotherm GmbH Eisenbahnstraße 12 D-56218 Mühlheim-Kärlich	
Format (measurement)		[mm]		$\geq 20DF (\geq 497 \times 300 \times 249)$	
Minimum thickness of member	$h_{\min} =$	[mm]		300	

**Table 10.47.2: Installation parameters**

Anchor size			W-UR 8
Drill hole diameter	$d_0$	[mm]	8
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5
Minimum edge distance	$c_{\min} \geq$	[mm]	100

**Table 10.47.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size			W-UR 8
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	<b>70</b>
<b>Bisomark<sup>TEC</sup>, <math>f_b \geq 1.6 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.6
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.5
<b>Bisomark<sup>TEC</sup>, <math>f_b \geq 2 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.75
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.6
<b>Bisomark<sup>TEC</sup>, <math>f_b \geq 4 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	1.5
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	1.2
Partial safety factor	$\gamma_{Mm}^2)$	[-]	2.5

- 1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.
- 2) In absence of other national regulations
- 3) Maximum long term temperature
- 4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Bisomark<sup>TEC</sup>**

Brick data, installation parameters,  
characteristic resistance

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**Base material solid masonry: Autoclaved Aerated Concrete AAC****Table 10.48.1: Brick data**

Description of brick		AAC	AAC
Type of brick			Autoclaved Aerated Concrete
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.3
Standard, approval			DIN 4165; EN 771-4
Measurement		[mm]	$\geq 499 \times 175 \times 249$
Minimum thickness of member	$h_{\min} =$	[mm]	175

**Table 10.48.2: Installation parameters**

Anchor size		W-UR 8	W-UR 10	
Drill hole diameter	$d_0$	[mm]	8	10
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	8.45	10.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80	80
Drill method		[-]	Hammer drilling	Hammer drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$	[mm]	70	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8.5	10.5

**Table 10.48.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8	W-UR 10	
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$	[mm]	70	70
<b>Autoclaved Aerated Concrete AAC</b> $f_b \geq 2 \text{ N/mm}^2$ <sup>5)</sup>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.5	0.75
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.4	0.6
<b>Autoclaved Aerated Concrete AAC</b> $f_b \geq 7 \text{ N/mm}^2$ <sup>5)</sup>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	2.98	3.09
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	2.38	2.47
Partial safety factor	$\gamma_{\text{MAAC}}^2)$	[-]	2.0	2.0

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

5) For the strength between AAC 2 and AAC7 the characteristic resistance  $F_{Rk}$  shall be determined by linear interpolation.

**Würth Plastic Anchor W-UR****Solid masonry: Autoclaved Aerated Concrete**

Brick data, installation parameters,  
characteristic resistance

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**(Prefabricated) Reinforced components made of autoclaved aerated concrete (AAC)****Table 10.49.1: Data**

Description		(Prefabricated) Reinforced components made of autoclaved aerated concrete
Bulk density	$\rho \geq$ [kg/dm <sup>3</sup> ]	0.4
Standard, approval		EN 12 602, DIN 4223
Minimum thickness of member	$h_{\min} =$ [mm]	175

**Table 10.49.2: Installation parameters**

Anchor size		W-UR 10
Drill hole diameter	$d_0$ [mm]	10
Cutting diameter of drill bit	$d_{\text{cut}} \leq$ [mm]	10.45
Depth of drill hole to deepest point	$h_1 \geq$ [mm]	80
Drill method	[-]	Hammer drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$ [mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	10.5
Minimum edge distance	$c_{\min} \geq$ [mm]	150

**Table 10.49.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 10
<b>(Prefabricated) Reinforced AAC</b> $f_b \geq 2 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$ [kN]	0.5
	Characteristic resistance $F_{Rk}$ $50^\circ\text{C}^3 / 80^\circ\text{C}^4$ [kN]	0.4
<b>(Prefabricated) Reinforced AAC</b> $f_b \geq 3 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$ [kN]	0.98
	Characteristic resistance $F_{Rk}$ $50^\circ\text{C}^3 / 80^\circ\text{C}^4$ [kN]	0.86
<b>(Prefabricated) Reinforced AAC</b> $f_b \geq 4 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$ [kN]	1.49
	Characteristic resistance $F_{Rk}$ $50^\circ\text{C}^3 / 80^\circ\text{C}^4$ [kN]	1.3
<b>(Prefabricated) Reinforced AAC</b> $f_b \geq 4.5 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$ [kN]	1.75
	Characteristic resistance $F_{Rk}$ $50^\circ\text{C}^3 / 80^\circ\text{C}^4$ [kN]	1.53
<b>(Prefabricated) Reinforced AAC</b> $f_b \geq 5 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$ [kN]	1.75
	Characteristic resistance $F_{Rk}$ $50^\circ\text{C}^3 / 80^\circ\text{C}^4$ [kN]	1.53
<b>(Prefabricated) Reinforced AAC</b> $f_b \geq 6 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$ [kN]	1.75
	Characteristic resistance $F_{Rk}$ $50^\circ\text{C}^3 / 80^\circ\text{C}^4$ [kN]	1.53
<b>(Prefabricated) Reinforced AAC</b> $f_b \geq 7 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$ [kN]	1.75
	Characteristic resistance $F_{Rk}$ $50^\circ\text{C}^3 / 80^\circ\text{C}^4$ [kN]	1.53
Partial safety factor	$\gamma_{\text{MAAC}}^2$ [-]	2.0

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Solid masonry: Reinforced components of autoclaved aerated concrete**

Brick data, installation parameters, characteristic resistance

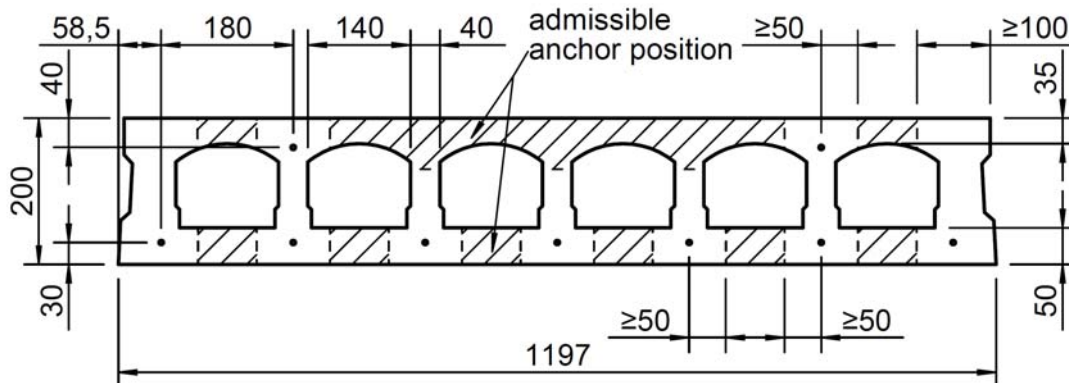
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**Base material precast prestressed hollow core elements: VMM-L SCD 20****Table 10.50.1: Data**

Description		VMM-L SCD 20
Type		Precast prestressed hollow core elements
Bulk density	$\rho \geq$ [kg/dm <sup>3</sup> ]	2.4
Standard, approval		DIN EN 1168: 2008-10; Z-15.10-276
Producer of brick		e.g. Ketonía GmbH Spannbeton-Fertigteilerwerk Almesbach 4 D-92637 Weiden
Format (measurement)	[mm]	$\geq 1200 \times 800 \times 200$
Minimum thickness of member	$h_{\min} =$ [mm]	200

**Table 10.50.2: Installation parameters**

Anchor size		W-UR 8
Drill hole diameter	$d_0$ [mm]	8
Cutting diameter of drill bit	$d_{\text{cut}} \leq$ [mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$ [mm]	80
Drill method	[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$ [mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	8.5

**Table 10.50.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8
Overall plastic anchor embedment depth	$h_{\text{nom}} =$ [mm]	<b>70</b>
<b>Precast prestressed hollow core elements VMM-L SCD 20, C45/55</b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$ [kN]	1.5
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$ [kN]	1.2
Characteristic resistance $F_{Rk}$	$\gamma_{Mc}^2)$ [-]	1.8

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading. The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Precast prestressed hollow core elements VMM-L SCD 20**

Brick data, installation parameters, characteristic resistance

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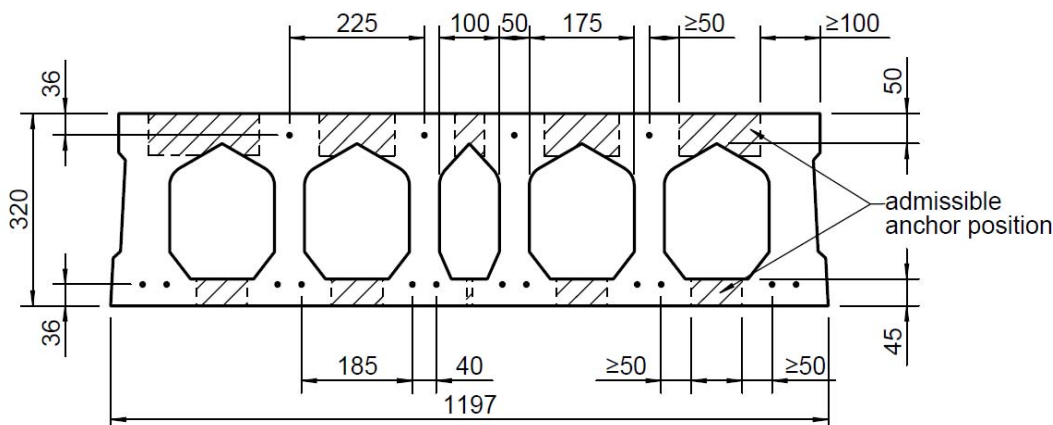
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**Base material precast prestressed hollow core elements: VMM-L EPD 32**

**Table 10.51.1: Data**

Description		VMM-L EPD 32
Type		Precast prestressed hollow core elements
Bulk density	$\rho \geq$ [kg/dm <sup>3</sup> ]	2.4
Standard, approval		DIN EN 1168: 2008-10; Z-15.10-276
Producer of brick		e.g. Ketonía GmbH Spannbeton-Fertigteilwerk Almesbach 4 D-92637 Weiden
Format (measurement)	[mm]	$\geq 1200 \times 800 \times 320$
Minimum thickness of member	$h_{min} =$ [mm]	320



**Table 10.51.2: Installation parameters**

Anchor size		W-UR 8
Drill hole diameter	$d_0$ [mm]	8
Cutting diameter of drill bit	$d_{cut} \leq$ [mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$ [mm]	80
Drill method	[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{nom} =$ [mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	8.5

**Table 10.51.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

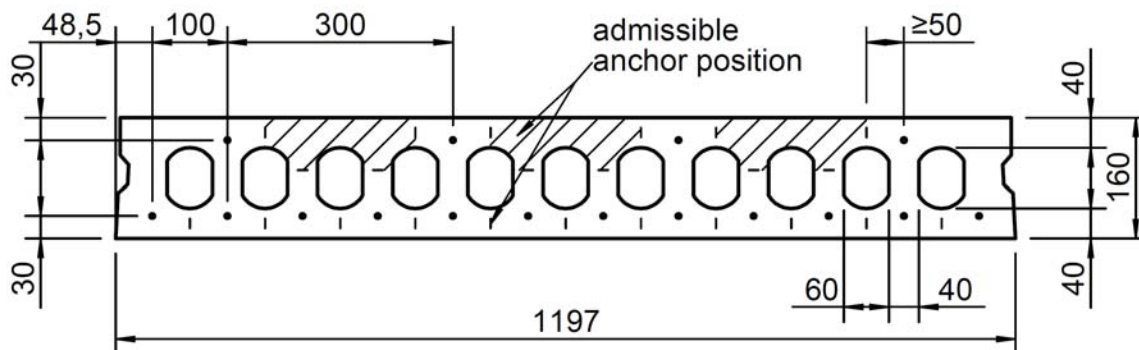
Anchor size		W-UR 8
Overall plastic anchor embedment depth	$h_{nom} =$ [mm]	<b>70</b>
Precast prestressed hollow core elements VMM-L EPD 32, C45/55	$30^\circ C^3) / 50^\circ C^4)$ [kN]	2.5
	$50^\circ C^3) / 80^\circ C^4)$ [kN]	1.5
Partial safety factor	$\gamma_{Mc}$ <sup>2)</sup> [-]	1.8

- 1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading. The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.
- 2) In absence of other national regulations
- 3) Maximum long term temperature
- 4) Maximum short term temperature

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<b>Precast prestressed hollow core elements VMM-L EPD 32</b> Brick data, installation parameters, characteristic resistance	

**Base material precast prestressed hollow core elements: VMM VSD 16****Table 10.52.1: Data**

Description		VMM VSD 16
Type		Precast prestressed hollow core elements
Bulk density	$\rho \geq$ [kg/dm <sup>3</sup> ]	2.4
Standard, approval		DIN EN 1168: 2008-10; Z-15.10-276
Producer of brick		z.B. Ketonía GmbH Spannbeton-Fertigteilwerk Almesbach 4 D-92637 Weiden
Format (measurement)	[mm]	$\geq 1200 \times 400 \times 160$
Minimum thickness of member	$h_{\min} =$ [mm]	160

**Table 10.52.2: Installation parameters**

Anchor size		W-UR 8
Drill hole diameter	$d_0$ [mm]	8
Cutting diameter of drill bit	$d_{\text{cut}} \leq$ [mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$ [mm]	80
Drill method	[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$ [mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	8.5

**Table 10.52.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8
Overall plastic anchor embedment depth	$h_{\text{nom}} =$ [mm]	<b>70</b>
<b>Precast prestressed hollow core elements VMM VSD 16, C45/55</b>	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$ [kN]	2.5
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$ [kN]	2.0
Partial safety factor	$\gamma_{\text{Mc}}^2)$ [-]	1.8

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR****Precast prestressed hollow core elements VMM VSD 16**

Brick data, installation parameters,  
characteristic resistance

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**Base material gypsum blocks: MultiGips R.max Schallschutzplatte****Table 10.53.1: Brick data**

Description of brick		MultiGips R.max Schallschutzplatte
Type of brick		Gypsum blocks
Bulk density	$\rho \geq$ [kg/dm <sup>3</sup> ]	1.2
Standard, approval		DIN EN 12859
Producer of brick		VG-ORTH GmbH & Co. KG Holeburgweg 24 D-37627 Stadtdendorf
Format (measurement)	[mm]	$\geq 500 \times 500 \times 100$
Minimum thickness of member	$h_{\min} =$ [mm]	100

**Table 10.53.2: Installation parameters**

Anchor size		W-UR 8
Drill hole diameter	$d_0$ [mm]	8
Cutting diameter of drill bit	$d_{\text{cut}} \leq$ [mm]	8.45
Depth of drill hole to deepest point	$h_1 \geq$ [mm]	80
Drill method	[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$ [mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	8.5

**Table 10.53.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 8
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$ [mm]	<b>70</b>
<b>Gypsum blocks:</b> <b>MultiGips R.max Schallschutzplatte,</b> $f_b \geq 11,7 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$ [kN]	1,2
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$ [kN]	1,2
Characteristic resistance $F_{Rk}$		
Partial safety factor	$\gamma_{Mm}^2)$ [-]	2,5

- 1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table 9. The specific conditions for the design method have to be considered according to chapter 4.2.5 of the ETA.
- 2) In absence of other national regulations
- 3) Maximum long term temperature
- 4) Maximum short term temperature

**Würth Plastic Anchor W-UR**

**Gypsum blocks:**  
**MultiGips R.max Schallschutzplatte**  
Brick data, installation parameters,  
characteristic resistance

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