

European technical approval ETA-11/0309

English translation prepared by DIBt - Original version in German language

Handelsbezeichnung
Trade name

Würth Kunststoff-Rahmendübel W-UR SymCon
Würth Plastic Anchor W-UR SymCon

Zulassungsinhaber
Holder of approval

Adolf Würth GmbH & Co. KG
Reinhold-Würth-Straße 12 -17
74653 Künzelsau
DEUTSCHLAND

Zulassungsgegenstand
und Verwendungszweck

Kunststoffdübel als Mehrfachbefestigung von nichttragenden Systemen zur Verankerung in Beton, Mauerwerk, Porenbeton, Wetterschalen und Hohlkammerdecken

*Generic type and use
of construction product*

Plastic anchor for multiple use in concrete, masonry, autoclaved aerated concrete, weather resistant skins and hollow core slabs for non-structural applications

Geltungsdauer:
Validity: vom
from
bis
to

12 April 2013

12 April 2018

Herstellwerk
Manufacturing plant

Herstellwerk 2

Diese Zulassung umfasst
This Approval contains

53 Seiten einschließlich 42 Anhänge
53 pages including 42 annexes

Diese Zulassung ersetzt
This Approval replaces

ETA-11/0309 mit Geltungsdauer vom 29.08.2011 bis 29.08.2016
ETA-11/0309 with validity from 29.08.2011 to 29.08.2016

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 products¹, modified by Council Directive 93/68/EEC² and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council³;
 - *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 1998⁴, as amended by Article 2 of the law of 8 November 2011⁵;*
 - Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex to Commission Decision 94/23/EC⁶;
 - 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.
- 5 Reproduction of this European technical approval including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of Deutsches Institut für Bautechnik. In this case partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the European technical approval.
- 6 The European technical approval is issued by the approval body in its official language. This version corresponds fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

¹ Official Journal of the European Communities L 40, 11 February 1989, p. 12
² Official Journal of the European Communities L 220, 30 August 1993, p. 1
³ Official Journal of the European Union L 284, 31 October 2003, p. 25
⁴ *Bundesgesetzblatt Teil I 1998*, p. 812
⁵ *Bundesgesetzblatt Teil I 2011*, p. 2178
⁶ 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 W-UR SymCon in the sizes W-UR 6, W-UR 10 and W-UR 14 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, 2 and 3.

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.

The base material may consist of use category a, b, c and d as given in the following Table:

Use category	Anchor type	Remarks
a	W-UR 6 SymCon W-UR 10 SymCon W-UR 14 SymCon	<ul style="list-style-type: none"> • Normal weight concrete • Strength class C12/15 at minimum according to EN 206-1:2000-12 • Cracked and non-cracked concrete • reinforced or unreinforced concrete
	W-UR 10 SymCon	• Hollow core slabs according to Annex 40
	W-UR 10 SymCon	• Weather resistant skins according to Annex 41, 42
b	W-UR 10 SymCon W-UR 14 SymCon	<ul style="list-style-type: none"> • Masonry walls according to Annex 10 • Mortar strength class \geq M 2,5 according to EN 998-2:2003
c	W-UR 10 SymCon W-UR 14 SymCon	<ul style="list-style-type: none"> • Masonry walls according to Annex 11, 12 • Mortar strength class \geq M 2,5 according to EN 998-2:2003
d	W-UR 10 SymCon	• Autoclaved aerated concrete walls according to Annex 39

Specific screw of galvanised steel:

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

The specific screw made of galvanised steel with exception of the stair bolt and the special screw with head-form loop according Annex 6 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 anchor W-UR 6 SymCon may only be used in temperature range c).

Specific screw of stainless steel:

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 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 4, 5 and 7. 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 documentation⁷ of this European technical approval.

The characteristic values for the design of the anchorages are given in Annex 9, Annexes 13 to 15 and Annexes 17 to 42.

Each anchor is to be marked with the identifying mark, the type, the diameter and the length of the anchor according to Annex 4 and 5. The special screws are marked according Annex 6.

The minimum embedment depth shall be marked.

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

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.

⁷

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.

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" and
- Part 4: "Plastic Anchors for Use in Hollow or Perforated Masonry"
- Part 5: "Plastic Anchors for Use in Autoclaved Aerated Concrete (AAC)"

based on the use categories a (W-UR 6 SymCon) or a, b, c and d (W-UR 10 SymCon, W-UR 14 SymCon).

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 Commission⁸ 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.⁹

⁸ Official Journal of the European Communities L 198 of 25.07.1997.

⁹ 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.

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.

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:

- name and address of the producer (legal entity responsible for the manufacturer),
- last two digits of the year in which the CE marking was affixed,
- number of the EC certificate for the factory production control,
- number of the European technical approval,
- number of the guideline for European technical approval
- use categories a (W-UR 6 SymCon) or a, b, c and d (W-UR 10 SymCon, W-UR 14 SymCon).

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.
- 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 the design value of actions N_{Sd} on a fixing point to a value $\leq n_3$ (kN) is specified 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 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:

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

- 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 ≤ 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 8, Table 3.1 and 3.2)

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 9.

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 9, 13 and 14. The design method is valid for cracked and non-cracked concrete.

The characteristic values of resistance of the anchor W-UR 10 SymCon for use in hollow core slabs are given in Annex 40. The characteristic values of resistance of the anchor W-UR 10 SymCon for use in weather resistant skins are given in Annex 42.

According to the EOTA 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 W-UR 10 SymCon, 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 17, 18, 29, 30 and 34 - 37. These values are independent of the load direction (tension, shear or combined tension and shear) and the mode of failure.

The characteristic resistances given 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 19 - 28, 31 - 33 and 38 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 8.

The influence of larger embedment depths [compare Annex 8, footnote 2]) and/or different bricks and blocks (according Annex 19 - 28, 31 - 33 and 38 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 (use category "d")

The characteristic values of resistance of the anchor for use in autoclaved aerated concrete are given in Annex 39. These values are independent of the load direction (tension, shear or combined tension and shear) and the mode of failure.

The characteristic resistances given for use in autoclaved aerated concrete 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.

4.2.6 Specific conditions for the design method in solid masonry and hollow or perforated masonry, autoclaved aerated concrete

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 $a_{min} \geq 250$ 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 or that the joints are glued together (AAC) or interlocking units are used.
- If the wall is designed such that the joints are not to be filled with mortar or if the joints are not to be glued together (AAC) or interlocking units

are used 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 $\alpha_j = 0.5$.

No reduction factor α_j and no limitation of the design resistance N_{Rd} has to be considered for anchorages in vertical joints (butt joints) and horizontal joints (bed joints) in masonry made of vertically perforated clay bricks made of interlocking units with thin bed joints.

4.2.7 Characteristic values, spacing and dimensions of anchorage member

The minimum spacing and dimensions of anchorage member according to Annex 15, Table 8 and Annex 16, Table 9 shall be observed depending on the base material.

4.2.8 Displacement behaviour

The displacements under tension and shear loading in concrete and masonry are given in Annex 15, Table 7.1 and 7.2.

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 19 – 28, 31 – 33 and 38 (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.
- 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 6 SymCon, W-UR 10 SymCon, W-UR 14 SymCon: $\geq -40\text{ °C}$

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 17 to 38 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 solid masonry are given in Annex 17, 18, 29, 30, 34 - 37 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 19 – 28, 31 – 33 and 38 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 19 – 28, 31 – 33 and 38.

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 $d_{cut,m} = 6,2 \text{ mm} < d_{cut} \leq 6,4 \text{ mm} = d_{cut,max}$ (W-UR 6 SymCon), $d_{cut,m} = 10,25 \text{ mm} < d_{cut} \leq 10,45 \text{ mm} = d_{cut,max}$ (W-UR 10 SymCon) or $d_{cut,m} = 14,25 \text{ mm} < d_{cut} \leq 14,5 \text{ mm} = d_{cut,max}$ (W-UR 14 SymCon) 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
- 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 (d_{cut}),
- overall anchor embedment depth in the base material (h_{nom}),
- minimum hole depth (h_0),
- 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

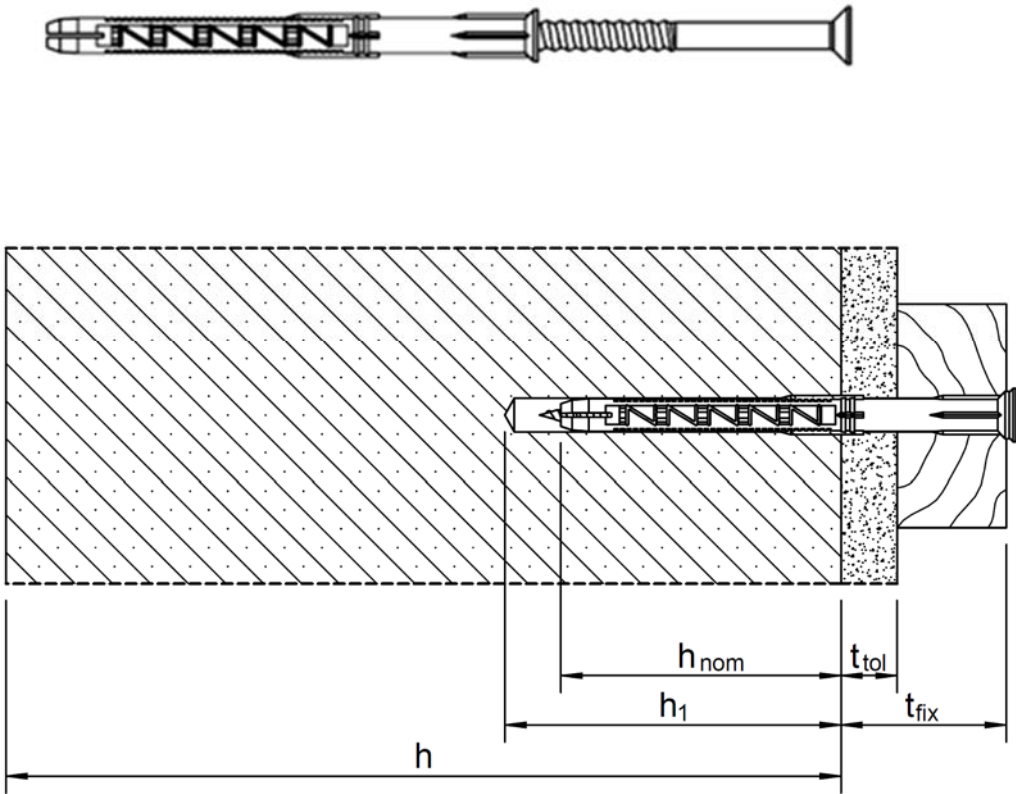
The anchor shall only be packaged and supplied as a complete unit.

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:
Bürger

Plastic Anchor W-UR 6 SymCon



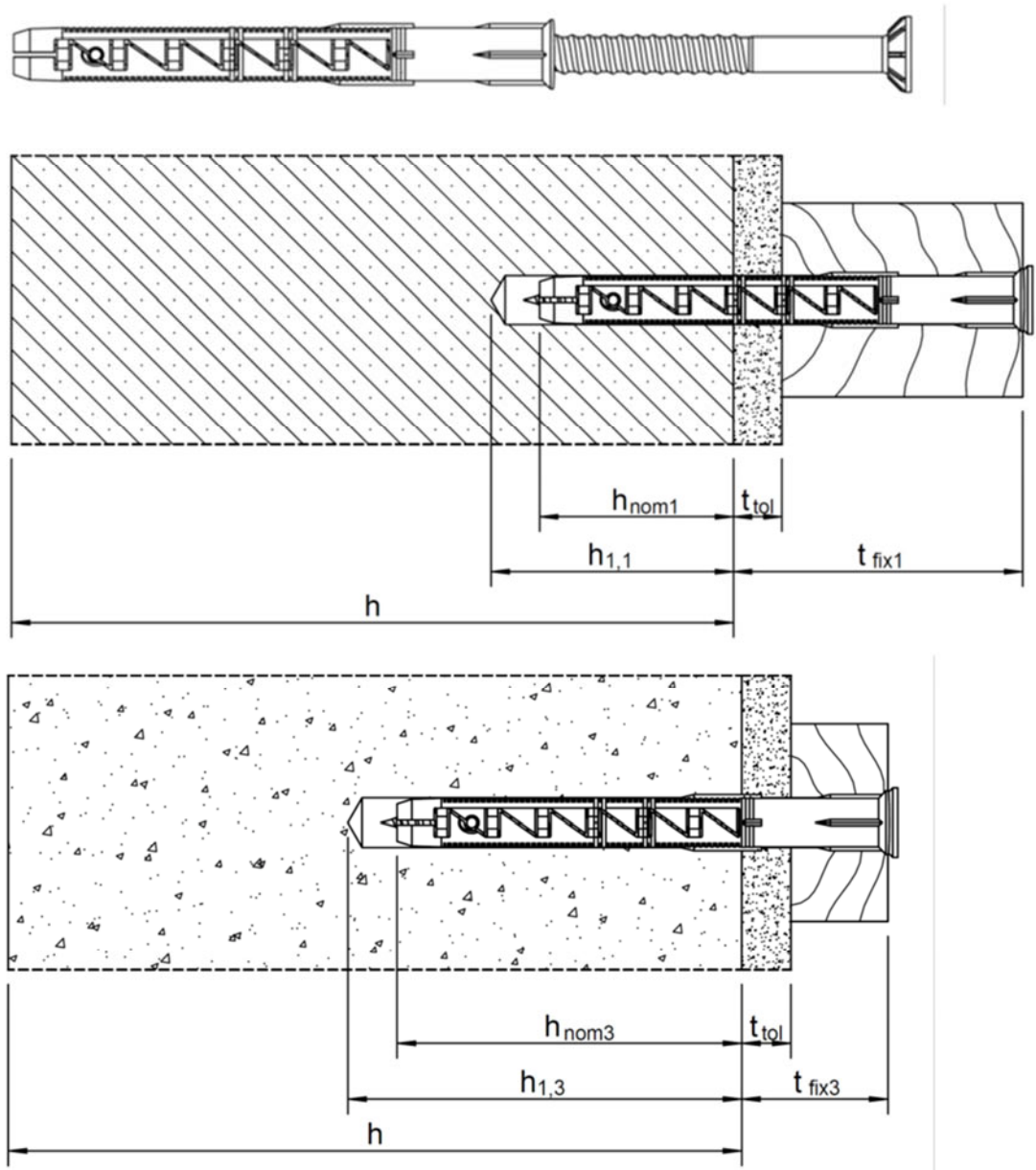
- h_{nom} : Overall plastic anchor embedment depth in the base material
- h_1 : Depth of drill hole to deepest point
- h : Thickness of member
- t_{fix} : Thickness of fixture
- t_{tol} : Thickness of non-load-bearing layer

Würth Plastic Anchor W-UR SymCon

Intended use: W-UR 6 SymCon

Annex 1

Plastic Anchor W-UR 10 SymCon



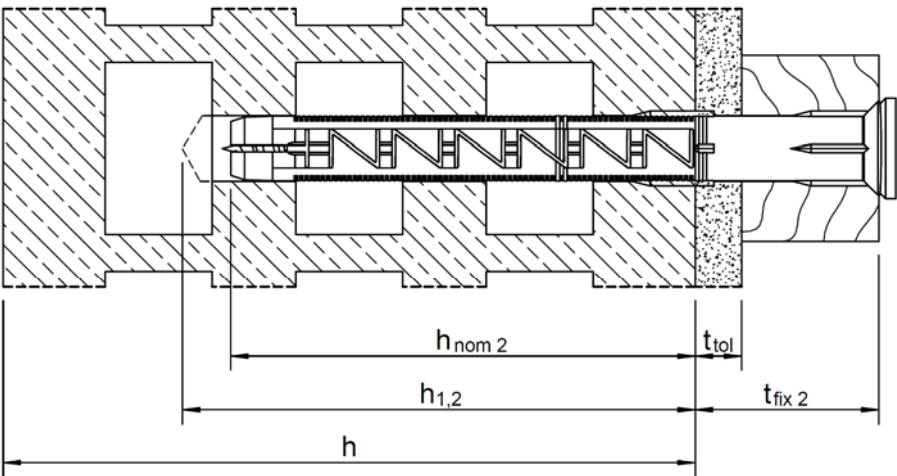
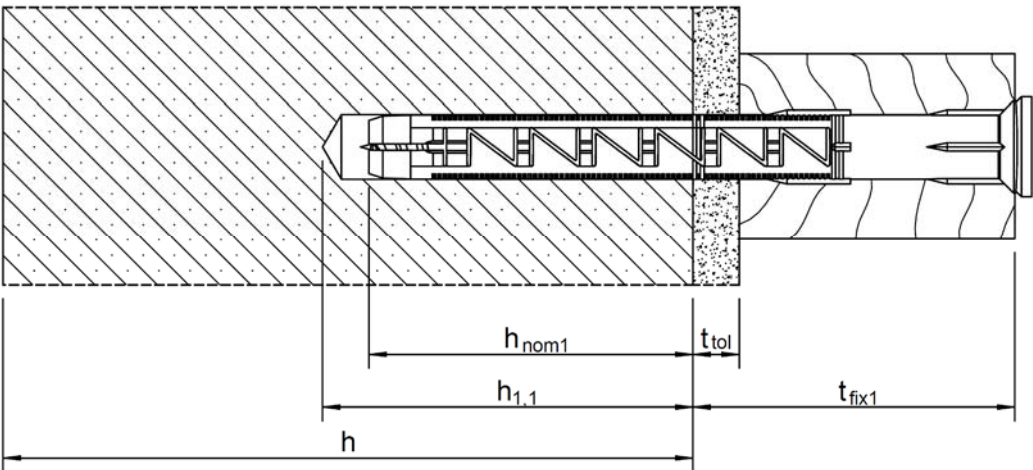
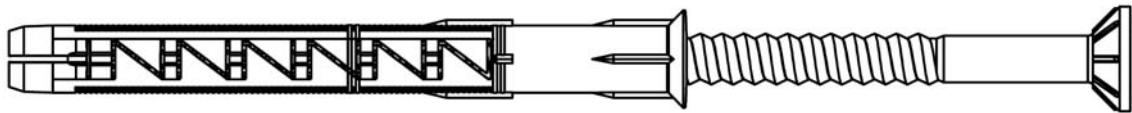
- h_{nom1} : Overall plastic anchor embedment depth 1 in the base material
- h_{nom3} : Overall plastic anchor embedment depth 3 in the base material
- $h_{1,1}$: Depth of drill hole to deepest point (1)
- $h_{1,3}$: Depth of drill hole to deepest point (3)
- h : Thickness of member
- t_{fix1} : Thickness of fixture (1)
- t_{fix3} : Thickness of fixture (3)
- t_{tol} : Thickness of non-load-bearing layer

Würth Plastic Anchor W-UR SymCon

Intended use: W-UR 10 SymCon

Annex 2

Plastic Anchor W-UR 14 SymCon



- h_{nom1} : Overall plastic anchor embedment depth 1 in the base material
 h_{nom2} : Overall plastic anchor embedment depth 2 in the base material
 $h_{1,1}$: 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

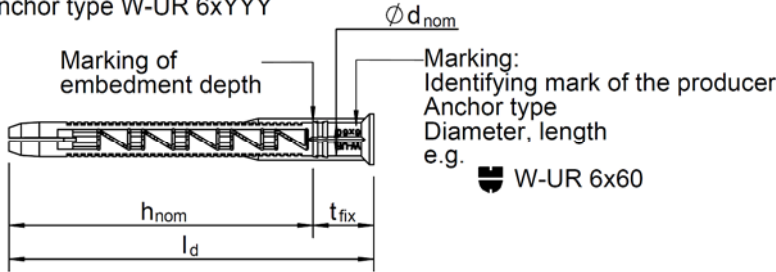
Würth Plastic Anchor W-UR SymCon

Intended use: W-UR 14 SymCon

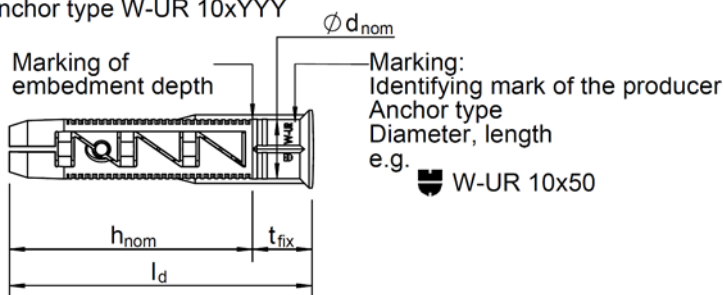
Annex 3

Plastic Anchor

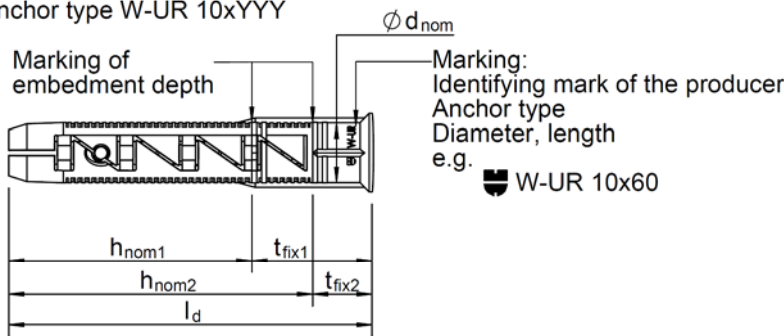
Anchor type W-UR 6xYYY



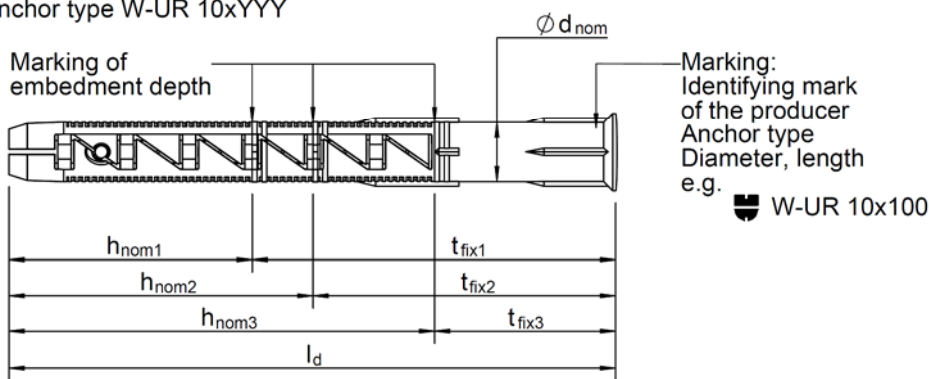
Anchor type W-UR 10xYYY



Anchor type W-UR 10xYYY



Anchor type W-UR 10xYYY

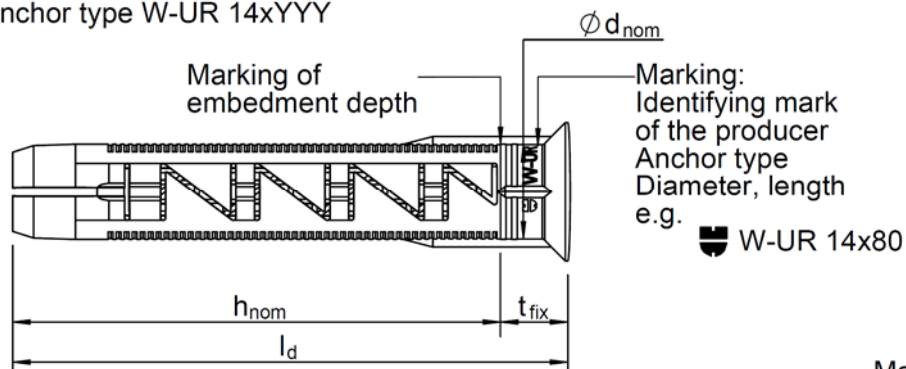


Würth Plastic Anchor W-UR SymCon

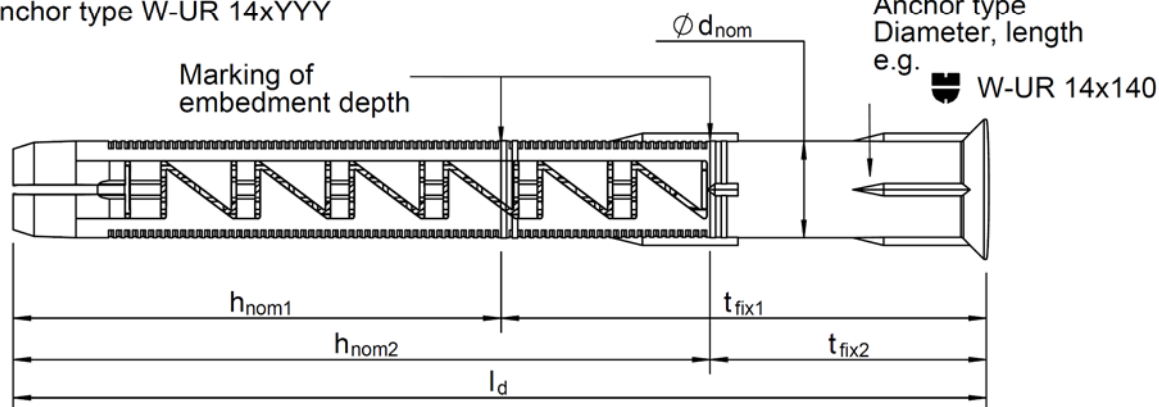
Plastic Anchor W-UR 6 and W-UR 10

Annex 4

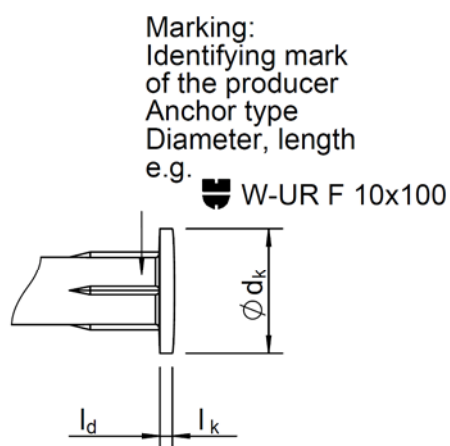
Anchor type W-UR 14xYYY



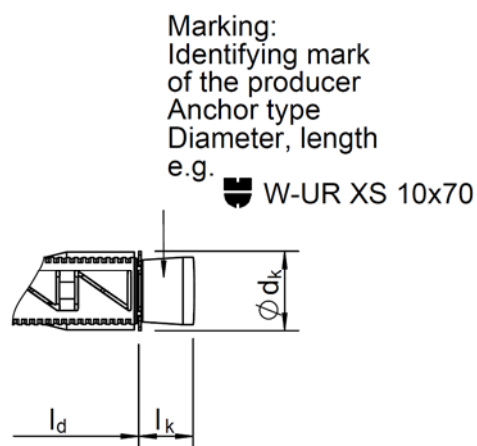
Anchor type W-UR 14xYYY



Anchor type W-UR F 6, 10 und 14



Anchor type W-UR XS 6, 10 und 14

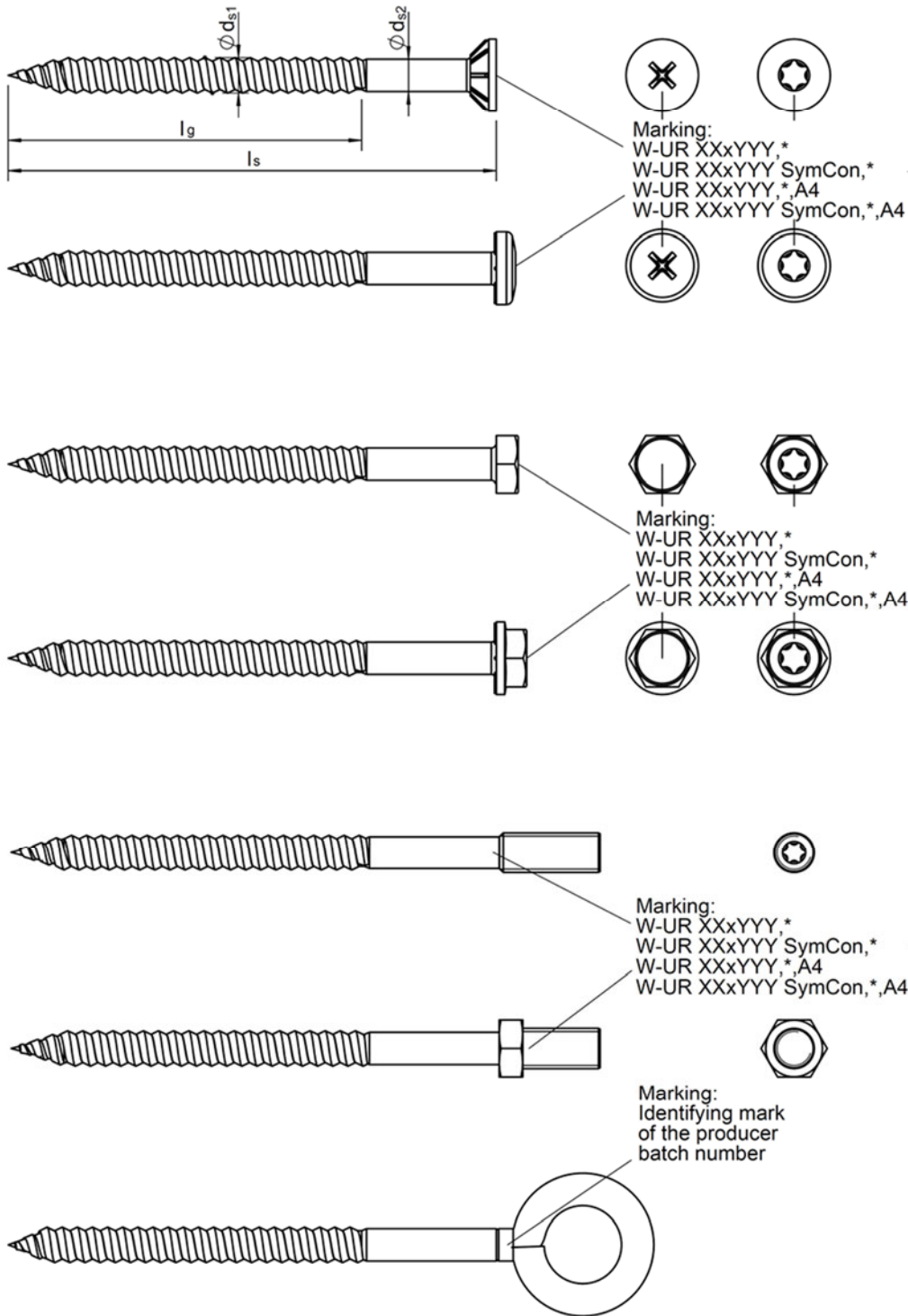


Würth Plastic Anchor W-UR SymCon

Plastic Anchor W-UR 14

Annex 5

Special screw



Würth Plastic Anchor W-UR SymCon

Special screw

Annex 6

Table 1.1: Anchor dimensions W-UR 6 SymCon, W-UR 10 SymCon

Anchor type		W-UR 6 SymCon	W-UR 10 SymCon	
		6 x l _d	10 x l _d	10 x l _d
Overall plastic anchor embedment depth ^{1),2)}	h _{nom} ≥ [mm]	50	40	40 (h _{nom1}) or 70 (h _{nom2})
Plastic sleeve				
Plastic sleeve diameter	Ø d _{nom} = [mm]	6	10	
Length of plastic sleeve	l _d [mm]	≥ 50	≥ 40	≥ 70
Flat collar diameter	Ø d _k = [mm]	12.5	18	
Thickness of flat collar	l _k ≥ [mm]	1.2	2	
Thickness of fixture	t _{fix} ≥ [mm]	0	0	
Special screw				
Screw diameter	d _{s1} = [mm]	5	7.2	
Screw diameter	d _{s2} = [mm]	4.55	7	
Length of screw	l _s = [mm]	l _d + 5 mm	l _d + 5 mm	
Length of thread	l _g = [mm]	55	45	75

¹⁾ See Annex 1, 2 and 3

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

Table 1.2: Anchor dimensions W-UR 14 SymCon

Anchor type		W-UR 14 SymCon	
		14 x 80	14 x l _d
Overall plastic anchor embedment depth ^{1),2)}	h _{nom} ≥ [mm]	70	70 (h _{nom1}) or 100 (h _{nom2})
Plastic sleeve			
Plastic sleeve diameter	Ø d _{nom} = [mm]	14	
Length of plastic sleeve	l _d [mm]	= 80	≥ 110
Flat collar diameter	Ø d _k = [mm]	24	
Thickness of flat collar	l _k ≥ [mm]	3	
Thickness of fixture	t _{fix} ≥ [mm]	0	
Special screw			
Screw diameter	d _{s1} = [mm]	10.5	
Screw diameter	d _{s2} = [mm]	9.6	9.6 (head-form loop: 9.6 or 12.0)
Length of screw	l _s = [mm]	l _d + 5 mm	
Length of thread	l _g = [mm]	75	105

¹⁾ See Annex 1, 2 and 3

²⁾ For hollow and perforated masonry the influence of h_{nom} > 100 mm (W-UR 14 SymCon) has to be detected by job site tests according 4.4.

For anchorages in hollow and perforated masonry with anchor type W-UR 14 SymCon 14 x l_d (with h_{nom1} = 70 mm and h_{nom2} = 100 mm) variable set in the range h_{nom1} = 70 mm ≤ h_{nom} < 100 mm = h_{nom2} the characteristic values F_{RK} for h_{nom1} = 70 mm may be taken without performing additional job site tests (compare Annex 26, 30 and 33).

For anchorages in hollow and perforated masonry with anchor type W-UR 14 x 80 SymCon (h_{nom} = 70 mm) the influence 70 < h_{nom} ≤ 79 mm always has to be detected by job site tests.

Würth Plastic Anchor W-UR SymCon

Anchor dimensions

Annex 7

Table 2: Materials

Designation	Material
Plastic sleeve	Polyamide, colour brown
Special screw	Carbon steel, according to DIN EN ISO 4042, galvanised Stainless steel, 1.4401, 1.4571 or 1.4578
Special screw – head-form loop $d_{s2} = 9.6 \text{ mm}$	Carbon steel, according to DIN EN ISO 4042, galvanised
Special screw – head-form loop $d_{s2} = 12 \text{ mm}$	Carbon steel, according to DIN EN ISO 4042, galvanised

Table 3.1: Installation parameters W-UR 6 SymCon, W-UR 10 SymCon

Anchor type		W-UR 6 SymCon	W-UR 10 SymCon	
		$6 \times l_d$	$10 \times l_d$	$10 \times l_d$
Drill hole diameter	$d_0 = [\text{mm}]$	6	10	
Overall plastic anchor embedment depth ^{1),2)}	$h_{nom} \geq [\text{mm}]$	50	37	40 (h_{nom1}) or 70 (h_{nom2})
Cutting diameter of drill bit	$d_{cut} \leq [\text{mm}]$	6.4	10.45	
Depth of drill hole to deepest point ¹⁾	$h_1 \geq [\text{mm}]$	60	50	50 ($h_{1,1}$) or 80 ($h_{1,2}$)
Diameter of clearance hole in the fixture	$d_f \leq [\text{mm}]$	6.5	10.5	

¹⁾ See Annex 1, 2 and 3

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

Table 3.2: Installation parameters W-UR 14 SymCon

Anchor type		W-UR 14 SymCon	
		14×80	$14 \times l_d$
Drill hole diameter	$d_0 = [\text{mm}]$	14	
Overall plastic anchor embedment depth ^{1),2)}	$h_{nom} \geq [\text{mm}]$	70	70 (h_{nom1}) or 100 (h_{nom2})
Cutting diameter of drill bit	$d_{cut} \leq [\text{mm}]$	14.45	
Depth of drill hole to deepest point ¹⁾	$h_1 \geq [\text{mm}]$	80	80 ($h_{1,1}$) or 110 ($h_{1,2}$)
Diameter of clearance hole in the fixture	$d_f \leq [\text{mm}]$	14.5	

¹⁾ See Annex 1, 2 and 3

²⁾ For hollow and perforated masonry the influence of $h_{nom} > 100 \text{ mm}$ (W-UR 14 SymCon) has to be detected by job site tests according 4.4.

For anchorages in hollow and perforated masonry with anchor type W-UR 14 SymCon $14 \times l_d$ (with $h_{nom1} = 70 \text{ mm}$ and $h_{nom2} = 100 \text{ mm}$) variable set in the range $h_{nom1} = 70 \text{ mm} \leq h_{nom} < 100 \text{ mm} = h_{nom2}$ the characteristic values F_{RK} for $h_{nom1} = 70 \text{ mm}$ may be taken without performing additional job site tests (compare Annex 26, 30 and 33).

For anchorages in hollow and perforated masonry with anchor type W-UR $14 \times 80 \text{ SymCon}$ ($h_{nom} = 70 \text{ mm}$) the influence $70 < h_{nom} \leq 79 \text{ mm}$ always has to be detected by job site tests.

Würth Plastic Anchor W-UR SymCon

Materials
Installation parameters

Annex 8

Table 4.1: Characteristic bending resistance of the special screw in concrete (W-UR 6 SymCon and W-UR 10 SymCon) and masonry (only W-UR 10 SymCon)

			Galvanised steel		Stainless steel	
			W-UR 6 SymCon	W-UR 10 SymCon	W-UR 6 SymCon A4	W-UR 14 SymCon A4
Screw diameter	d_{s1} / d_{s2}	[mm]	5 / 4.55	7.2 / 7	5 / 4.55	7.2 / 7
Characteristic bending resistance	$M_{Rk,S}$	[Nm]	4.19	17.67	4.89	20.62
Partial safety factor	$\gamma_{Ms}^{1)}$	[mm]	1.25	1.25	1.56	1.56

¹⁾ In absence of other national regulations

Table 4.2: Characteristic bending resistance of the special screw in concrete (W-UR 14 SymCon) and masonry (W-UR 14 SymCon)

			Galvanised steel			Stainless steel
			W-UR 14 SymCon	W-UR 14 SymCon head-form loop		W-UR 14 SymCon A4
Screw diameter	d_{s1} / d_{s2}	[mm]	10.5 / 9.6	10.5 / 9.6	10.5 / 12	10.5 / 9.6
Characteristic bending resistance	$M_{Rk,S}$	[Nm]	41.9	41.9	27.93	48.88
Partial safety factor	$\gamma_{Ms}^{1)}$	[mm]	1.25	1.25	1.25	1.56

¹⁾ In absence of other national regulations

Würth Plastic Anchor W-UR SymCon

Characteristic bending resistance

Annex 9

Table 5.1: Base material: Concrete (W-UR 6 SymCon, W-UR 10 SymCon and W-UR 14 SymCon) and solid masonry (W-UR 10 SymCon and W-UR 14 SymCon)

Base material	Format	Measurement [mm]	Minimum compressive strength [N/mm ²]	Bulk density class [kg/dm ³]	Annex
Concrete (use category "a")					
Concrete ≥ C12/15					Annex 13 Annex 14
Solid masonry (use category "b")					
Solid brick Mz acc. to DIN 105-100 EN 771-1 e.g. Wienerberger GmbH	≥ NF	≥ 240x115x71	10 20	≥ 1.8	Annex 17 771-1-020
	≥ 3DF	≥ 240x175x113	28 36		Annex 18 771-1-041
Sand-lime solid brick KS acc. to DIN V 106 EN 771-2	≥ NF	≥ 240x115x71	10 20	≥ 2.0	Annex 29 771-2-011
Sand-lime solid brick Silka XL Basic, Sand-lime solid brick Silka XL Plus, acc. to DIN V 106 EN 771-2 Z-17.1-997 e.g. Xella International GmbH		≥ 248x175x498	10 20 28	≥ 2.0	Annex 30 771-2-010
Concrete solid block - Vn and Vbn acc. to DIN 18153-100 EN 771-3 Bisotherm GmbH	≥ NF	≥ 240x115x71	10 20 28	≥ 2.0	Annex 34 771-3-004
Lightweight concrete solid block – V and Vbl; e.g. Bisophon acc. to DIN V 18152-100 EN 771-3 Bisotherm GmbH	≥ 3DF	≥ 240x175x113	10 20	≥ 2.0	Annex 35 771-3-017
Lightweight concrete solid brick e.g. BisoBims V and Vbl acc. to DIN V 18152-100 EN 771-3 Bisotherm GmbH	≥ NF	≥ 240x115x71	2 4	≥ 1.0	Annex 36 771-3-007
Lightweight concrete solid brick e.g. BisoBims V and Vbl acc. to DIN V 18152-100 EN 771-3 Bisotherm GmbH	≥ 3DF	≥ 240x175x113	2 4	≥ 1.0	Annex 37 771-3-015

Würth Plastic Anchor W-UR SymCon

Base material: Concrete and solid masonry (use category "a" and "b")
Format, measurement, minimum compressive strength, Annex

Annex 10

Table 5.2: Base material: Hollow or perforated masonry (W-UR 10 SymCon and W-UR 14 SymCon)

Base material	Format	Measurement [mm]	Minimum compressive strength [N/mm ²]	Bulk density class [kg/dm ³]	Annex
Hollow or perforated masonry (use category "c")					
Hollow brick HLz acc. to DIN 105-100 EN 771-1 e.g. Wienerberger GmbH e.g. Schlagmann Baustoffwerke GmbH & Co. KG	≥ 2DF	≥ 240x115x113	10 20	≥ 1.2	Annex 19 771-1-036
Hollow brick HLz acc. to DIN 105-100 EN 771-1 e.g. Wienerberger GmbH e.g. Schlagmann Baustoffwerke GmbH & Co. KG	≥ 12DF	≥ 373x240x238	6 8 10	≥ 1.2	Annex 20 771-1-036
Hollow brick HLz T14-24,0 EN 771-1 Z-17.1-651 Wienerberger GmbH	≥ 10DF	≥ 308x240x249	6	≥ 0.7	Annex 21 771-1-048
Hollow brick POROTON-T8-P acc. to T8: EN 771-1; Z-17.1-982 Wienerberger GmbH Schlagmann Baustoffwerke GmbH & Co. KG	≥ 10DF	≥ 248x300x249	4 6 8	≥ 0.6	Annex 22 771-1-022
Hollow brick POROTON-T9-P acc. to T9: EN 771-1; Z-17.1-674 Wienerberger GmbH Schlagmann Baustoffwerke GmbH & Co. KG	≥ 10DF	≥ 248x300x249	6 8	≥ 0.6	Annex 23 771-1-022
Hollow brick POROTON S10 acc. to EN 771-1 Z-17.1-1017 Wienerberger GmbH Schlagmann Baustoffwerke GmbH & Co. KG	≥ 10DF	≥ 248x300x249	6 8 10	≥ 0.75	Annex 24 771-1-032
Hollow brick POROTON-S11-P 30,0 acc. to EN 771-1 Z-17.1-812 Wienerberger GmbH Schlagmann Baustoffwerke GmbH & Co. KG	≥ 10DF	≥ 248x300x249	8	≥ 0.9	Annex 25 771-1-046
Hollow brick ThermoPlan MZ10 EN 771-1 Z-17.1-1015 Mein Ziegelhaus GmbH & Co. KG	≥ 10DF	≥ 248x300x249	8	≥ 0.75	Annex 26 771-1-034

Würth Plastic Anchor W-UR SymCon

Base material: Hollow masonry (use category "c")
Format, measurement, minimum compressive strength, Annex

Annex 11

Table 5.3: Base material: Hollow or perforated masonry (W-UR 10 SymCon and W-UR 14 SymCon)

Base material	Format	Measurement [mm]	Minimum compressive strength [N/mm ²]	Bulk density class [kg/dm ³]	Annex
Hollow or perforated masonry (use category "c")					
Hollow brick ThermoPlan TS² EN 771-1 Z-17.1-993 Mein Ziegelhaus GmbH & Co. KG	≥ 9DF	≥ 373x175x249	6 8 10 12 20	≥ 0.9	Annex 27 771-1-024
Hollow brick THERMOPOR TV 9-Plan EN 771-1 Z-17.1-1006 Thermopor Ziegel-Kontor Ulm GmbH	≥ 10DF	≥ 247x300x249	4 6 8	≥ 0.75	Annex 28 771-1-029
Sand-lime perforated brick KS L acc. to DIN V 106 EN 771-2	≥ 2DF	≥ 240x115x113	6 8 10 12	≥ 1.4	Annex 31 771-2-004
Sand-lime perforated brick KS L acc. to DIN V 106 EN 771-2 e.g. Xella International GmbH	≥ 8DF	≥ 248x240x238	6 8 10 12	≥ 1.4	Annex 32 771-2-013
Sand-lime perforated brick KS L acc. to DIN V 106 EN 771-2 e.g. Xella International GmbH	≥ 9DF	≥ 373x175x238	6 8 10 12 20	≥ 1.4	Annex 33 771-2-008
Hollow brick lightweight concrete 3K Hbl DIN 18151 EN 771-3 e.g. Heinzmann Baustoffe GmbH, Liapor GmbH & Co. KG	≥ 16DF	≥ 498x240x238	2 4 6	≥ 0.7	Annex 38 771-3-005
Autoclaved aerated concrete masonry (use category "d")					
Autoclaved aerated concrete AAC e.g. DIN 4165 EN 771-4		≥ 498x100x249	2 - 7	≥ 0.3	Annex 39
Precast prestressed hollow core slabs e.g. DIN EN 1168			≥ C30/37		Annex 40
Weather Resistant Skins of External Wall Panels			≥ C16/20		Annex 41

Würth Plastic Anchor W-UR SymCon

**Base material: Hollow masonry, AAC, precast prestressed hollow core slabs,
weather resistant skins of external wall panels**
Format, measurement, minimum compressive strength, Annex

Annex 12

Table 6.1: Characteristic resistance for use in concrete (W-UR 6 SymCon, W-UR 10 SymCon)

Anchor type			Galvanised steel W-UR SymCon			Stainless steel W-UR SymCon		
Failure of expansion element (special screw)			6	10		6	10	
Overall plastic anchor embedment depth	h_{nom}	[mm]	50	40	70	50	40	70
Screw diameter	d_{s1}/d_{s2}	[mm]	5 / 4.55	7.2 / 7		5 / 4.55	7.2 / 7	
Characteristic tension resistance	$N_{Rk,s}$	[kN]	7.17	18.70		8.36	21.82	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1.5	1.5		1.87	1.87	
Characteristic shear resistance	$V_{Rk,s}$	[kN]	3.58	9.35		4.18	10.91	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1.25	1.25		1.56	1.56	
Pull-out failure (plastic sleeve)								
Concrete \geq C16/20								
Characteristic resistance	$30^{\circ}\text{C}^{2)}$ / $50^{\circ}\text{C}^{3)}$ $N_{Rk,p}$	[kN]	2.0	5.0	8.5	2.0	5.0	8.5
	$50^{\circ}\text{C}^{2)}$ / $80^{\circ}\text{C}^{3)}$ $N_{Rk,p}$	[kN]	-	4.5	7.5	-	4.5	7.5
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	1.8	1.8		1.8	1.8	
Concrete C12/15								
Characteristic resistance	$30^{\circ}\text{C}^{2)}$ / $50^{\circ}\text{C}^{3)}$ $N_{Rk,p}$	[kN]	2.0	3.5	6.5	2.0	3.5	6.5
	$50^{\circ}\text{C}^{2)}$ / $80^{\circ}\text{C}^{3)}$ $N_{Rk,p}$	[kN]	-	3.0	5.0	-	3.0	5.0
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	1.8	1.8		1.8	1.8	
Concrete cone failure and concrete edge failure for single anchor and anchor group								
Tension load ⁴⁾								
$N_{Rk,c} = 7.2 \cdot \sqrt{f_{ck,cube}} \cdot h_{ef}^{1.5} \cdot \frac{C}{C_{cr,N}} = N_{Rk,p} \cdot \frac{C}{C_{cr,N}}$								
<div>with: $h_{ef}^{1.5} = \frac{N_{Rk,p}}{7.2 \cdot \sqrt{f_{ck,cube}}}$</div>								
$\frac{C}{C_{cr,N}} \leq 1$								
Shear load ⁴⁾								
$V_{Rk,c} = 0.45 \cdot \sqrt{d_{nom}} \cdot (h_{nom} / d_{nom})^{0.2} \cdot \sqrt{f_{ck,cube}} \cdot c_1^{1.5} \cdot \left(\frac{C_2}{1.5c_1}\right)^{0.5} \cdot \left(\frac{h}{1.5c_1}\right)^{0.5}$								
<div>with: $\left(\frac{C_2}{1.5 \cdot c_1}\right)^{0.5} \leq 1$</div>								
$\left(\frac{h}{1.5 \cdot c_1}\right)^{0.5} \leq 1$								
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 SymCon

Characteristic resistance for use in concrete (W-UR 6 SymCon, W-UR 10 SymCon)

Annex 13

Table 6.2: Characteristic resistance for use in concrete (W-UR 14 SymCon)

Anchor type			Galvanised steel W-UR SymCon				Stainless steel W-UR SymCon	
Failure of expansion element (special screw)			14		Head-form Loop 14			
Overall plastic anchor embedment depth	h_{nom}	[mm]	70	100	70	100	70	100
Screw diameter	d_{s1}/d_{s2}	[mm]	10.5 / 9.6		10.5 / 9.6	10.5 / 12.0	10.5 / 9.6	10.5 / 12.0
Characteristic tension resistance	$N_{Rk,s}$	[kN]	33.25		33.25	22.17	33.25	22.17
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1.5		1.5	1.5	1.5	1.5
Characteristic shear resistance	$V_{Rk,s}$	[kN]	16.63		16.63	11.08	16.63	11.08
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1.25		1.25	1.25	1.25	1.25
Pull-out failure (plastic sleeve)								
Concrete \geq C16/20								
Characteristic resistance	$30^{\circ}\text{C}^{2)}$ / $50^{\circ}\text{C}^{3)}$ $N_{Rk,p}$	[kN]	8.5	8.5	8.5	8.5	8.5	8.5
	$50^{\circ}\text{C}^{2)}$ / $80^{\circ}\text{C}^{3)}$ $N_{Rk,p}$	[kN]	7.5	8.5	7.5	8.5	7.5	8.5
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	1.8		1.8	1.8	1.8	1.8
Concrete C12/15								
Characteristic resistance	$30^{\circ}\text{C}^{2)}$ / $50^{\circ}\text{C}^{3)}$ $N_{Rk,p}$	[kN]	6.0	6.0	6.0	6.0	6.0	6.0
	$50^{\circ}\text{C}^{2)}$ / $80^{\circ}\text{C}^{3)}$ $N_{Rk,p}$	[kN]	5.5	6.0	5.5	6.0	5.5	6.0
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	1.8		1.8	1.8	1.8	1.8
Concrete cone failure and concrete edge failure for single anchor and anchor group								
Tension load ⁴⁾								
<div>$N_{Rk,c} = 7.2 \cdot \sqrt{f_{ck,cube}} \cdot h_{ef}^{1.5} \cdot \frac{C}{C_{cr,N}} = N_{Rk,p} \cdot \frac{C}{C_{cr,N}}$</div> <div><div>with: $h_{ef}^{1.5} = \frac{N_{Rk,p}}{7.2 \cdot \sqrt{f_{ck,cube}}}$</div><div>$\frac{C}{C_{cr,N}} \leq 1$</div></div>								
Shear load ⁴⁾								
<div>$V_{Rk,c} = 0.45 \cdot \sqrt{d_{nom}} \cdot (h_{nom} / d_{nom})^{0.2} \cdot \sqrt{f_{ck,cube}} \cdot c_1^{1.5} \cdot \left(\frac{C_2}{1.5c_1}\right)^{0.5} \cdot \left(\frac{h}{1.5c_1}\right)^{0.5}$</div> <div><div>with: $\left(\frac{C_2}{1.5 \cdot c_1}\right)^{0.5} \leq 1$</div><div>$\left(\frac{h}{1.5 \cdot c_1}\right)^{0.5} \leq 1$</div></div>								
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 SymCon

Characteristic resistance for use in concrete (W-UR 14 SymCon)

Annex 14

Table 7.1: Displacements¹⁾ under tension and shear loading in concrete and masonry

Anchor type	h_{nom} [mm]	Tension load			Shear load		
		$F_{Rk}^{2)}$ [kN]	δ_{N0} [mm]	$\delta_{N\infty}$ [mm]	$F_{Rk}^{2)}$ [kN]	δ_{V0} [mm]	$\delta_{V\infty}$ [mm]
W-UR 6 SymCon	50	1.0	0.38	0.76	1.0	0.68	1.02
W-UR 10 SymCon	40	2.0	0.58	1.16	2.0	3.4	5.1
	50	2.0	0.58	1.16	2.0	3.4	5.1
	70	2.0	0.58	1.16	2.0	3.4	5.1
W-UR 14 SymCon	70	3.4	0.98	1.96	3.4	1.95	3.9
	100	3.4	0.98	1.96	3.4	1.95	3.9

¹⁾ Valid for all ranges of temperatures

²⁾ Intermediate values by linear interpolation

Table 7.2: Displacements¹⁾ under tension and shear loading in autoclaved aerated concrete AAC

Anchor type	h_{nom} [mm]	Tension load			Shear load		
		$F_{Rk}^{2)}$ [kN]	δ_{N0} [mm]	$\delta_{N\infty}$ [mm]	$F_{Rk}^{2)}$ [kN]	δ_{V0} [mm]	$\delta_{V\infty}$ [mm]
W-UR 10 SymCon	40	0.27	0.11	0.22	0.27	0.54	0.81

¹⁾ Valid for all ranges of temperatures

²⁾ Intermediate values by linear interpolation

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

W-UR 6 SymCon: Fixing points with a spacing $s_{cr,N} \leq 55$ mm are considered as a group with a max. characteristic resistance $N_{Rk,p}$ acc. to Table 6.1. For $s_{cr,N} > 55$ mm, the anchors are considered as single anchors, each with a characteristic resistance $N_{Rk,p}$ acc to Table 6.1.

W-UR 10 SymCon: Fixing points with a spacing $s_{cr,N} \leq 125$ mm are considered as a group with a max. characteristic resistance $N_{Rk,p}$ acc. to Table 6.1. For $s_{cr,N} > 125$ mm, the anchors are considered as single anchors, each with a characteristic resistance $N_{Rk,p}$ acc. to Table 6.1.

W-UR 14 SymCon: Fixing points with a spacing $s_{cr,N} \leq 125$ mm are considered as a group with a max. characteristic resistance $N_{Rk,p}$ acc. to Table 6.2. For $s_{cr,N} > 125$ mm, the anchors are considered as single anchors, each with a characteristic resistance $N_{Rk,p}$ acc. to Table 6.2.

		h_{nom} [mm]	h_{min} [mm]	$c_{cr,N}$ [mm]	c_{min} [mm]	s_{min} [mm]
W-UR 6 SymCon	Concrete \geq C16/20	≥ 50	90	40	40	40
	Concrete C12/15	≥ 50	90	60	60	60
W-UR 10 SymCon	Concrete \geq C16/20	≥ 40	80	60	40	50
	Concrete C12/15	≥ 40	80	80	60	70
	Concrete \geq C16/20	≥ 70	110	60	60	50
	Concrete C12/15	≥ 70	110	80	80	70
W-UR 14 SymCon	Concrete \geq C16/20	≥ 70	110	80	60	60
	Concrete C12/15	≥ 70	110	110	85	85
	Concrete \geq C16/20	≥ 100	140	100	80	80
	Concrete C12/15	≥ 100	140	140	115	115

Würth Plastic Anchor W-UR SymCon

Displacements, minimum thickness of member, edge distance and anchor spacing

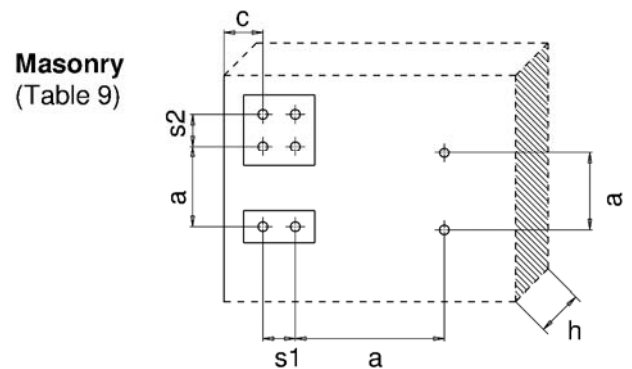
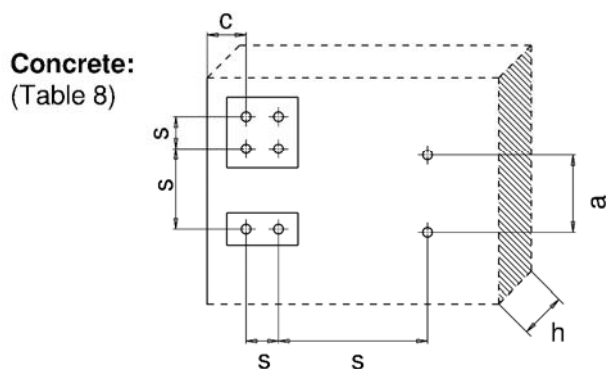
Annex 15

Table 9: Minimum thickness of member, edge distance and anchor spacing in masonry and autoclaved aerated concrete

			W-UR 10 SymCon			W-UR 14 SymCon
			Masonry	Autoclaved Aerated Concrete		Masonry
				AAC 2	AAC 6	
Overall plastic anchor embedment depth	h_{nom}	[mm]	70	70		100
Minimum thickness of member	h_{min}	[mm]	115 ¹⁾	100		100 ¹⁾
Single anchor						
Minimum allowable spacing	a_{min}	[mm]	250	250	250	250
Minimum allowable edge distance	c_{min}	[mm]	50 ¹⁾	60	100	100 (240) ²⁾
Anchor group						
Spacing perpendicular to free edge	$s_{1,min}$	[mm]	100	100	165	200 (400) ²⁾
Spacing parallel to free edge	$s_{2,min}$	[mm]	100	100	165	400 (960) ²⁾
Minimum allowable edge distance	c_{min}	[mm]	50 ¹⁾	60	100	100 (240) ²⁾

¹⁾ depends on the brick size (see the following annexes 17 to 39)

²⁾ depends on brick (see the following annexes 17 to 39) – the values in brackets govern for masonry units with a height < 100 mm



Würth Plastic Anchor W-UR SymCon

Minimum thickness of member, edge distance and anchor spacing

Annex 16

Base material solid masonry: Solid brick Mz, NF

Table 10.1.1: Brick data

Description of brick		771-1-020	Mz
Type of brick			Solid brick Mz
Bulk density	$\rho \geq$	[kg/dm ³]	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 10 SymCon	W-UR 14 SymCon
Drill hole diameter	$d_0 =$	[mm]	10	14
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	10.45	14.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80	80
Drill method		[-]	Hammer drilling	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	10.5	14.5
Minimum allowable edge distance	$c_{\text{min}} \geq$	[mm]	70	240

Table 10.1.3: Characteristic resistance F_{Rk} ¹⁾ in [kN] for single anchor

Anchor size			W-UR 10 SymCon	W-UR 14 SymCon
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	70	70
Solid brick Mz, $f_b \geq 10 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	0.9	1.2
Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]	0.75	1.2
Solid brick Mz, $f_b \geq 20 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	1.2	2.0
Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]	1.2	1.5
Solid brick Mz, $f_b \geq 28 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	2.0	2.5
Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]	2.0	2.5
Solid brick Mz, $f_b \geq 36 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	2.5	3.5
Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]	2.5	3.0
Partial safety factor	γ_{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 4.2.6 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 SymCon

Solid masonry: Solid brick Mz, NF

Brick data, installation parameters, characteristic resistance

Annex 17

Base material solid masonry: Solid brick Mz, 3DF

Table 10.2.1: Brick data

Description of brick		771-1-041	Mz
Type of brick			Solid brick Mz
Bulk density	$\rho \geq$	[kg/dm ³]	1.8
Standard, approval			DIN 105; EN 771-1
Producer of brick			e.g. Wienerberger GmbH
Format (measurement)		[mm]	$\geq 3DF (\geq 240 \times 175 \times 113)$
Minimum thickness of member	$h_{\min} =$	[mm]	175

Table 10.2.2: Installation parameters

Anchor size			W-UR 10 SymCon	W-UR 14 SymCon
Drill hole diameter	$d_0 =$	[mm]	10	14
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	10.45	14.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80	110
Drill method		[-]	Hammer drilling	
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$	[mm]	70	100
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	10.5	14.5
Minimum allowable edge distance	$c_{\text{min}} \geq$	[mm]	70	100

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

Anchor size			W-UR 10 SymCon	W-UR 14 SymCon
Overall plastic anchor embedment depth	$h_{nom} \geq$	[mm]	70	100
Solid brick Mz, $f_b \geq 10 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	2.5	4.0
	Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]	2.5
Solid brick Mz, $f_b \geq 20 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	4.0	5.5
	Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]	4.0
Solid brick Mz, $f_b \geq 28 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	5.5	5.5
	Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]	5.5
Partial safety factor	γ_{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 4.2.6 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 SymCon

Solid masonry: Solid brick Mz, 3DF
Brick data, installation parameters, characteristic resistance

Annex 18

Base material hollow masonry: Hollow brick HLz, 2DF

Table 10.3.1: Brick data

Description of brick		771-1-021	HLz
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm ³]	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

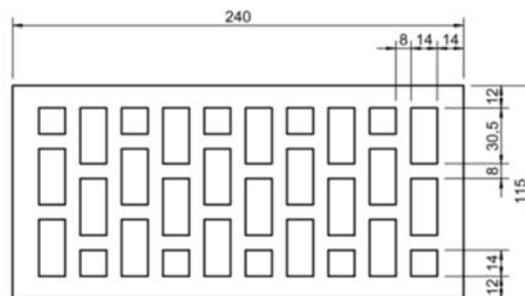


Table 10.3.2: Installation parameters

Anchor size			W-UR 10 SymCon
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		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	10.5
Minimum allowable edge distance	$c_{\text{min}} \geq$	[mm]	65

Table 10.3.3: Characteristic resistance F_{Rk} ¹⁾ in [kN] for single anchor

Anchor size			W-UR 10 SymCon
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Hollow brick HLz, $f_b \geq 10 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	1.2
Characteristic resistance F_{Rk}	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	1.2
Hollow brick HLz, $f_b \geq 20 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	2.0
Characteristic resistance F_{Rk}	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	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 4.2.6 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 SymCon

Hollow brick HLz, 2DF

Brick data, installation parameters, characteristic resistance

Annex 19

Base material hollow masonry: Hollow brick HLz, 12DF

Table 10.4.1: Brick data

Description of brick		771-1-036	HLz
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm ³]	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

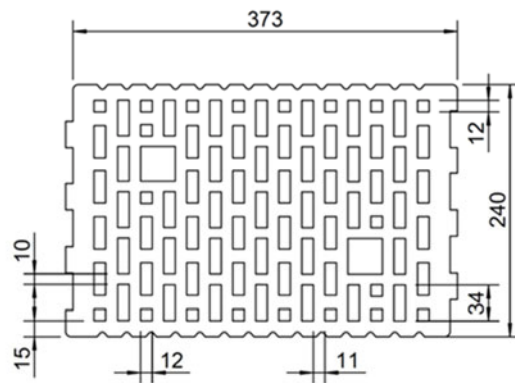


Table 10.4.2: Installation parameters

Anchor size		W-UR 10 SymCon	W-UR 14 SymCon
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		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	10.5
Minimum allowable edge distance	$c_{\min} \geq$	[mm]	65

Table 10.4.3: Characteristic resistance F_{Rk} ¹⁾ in [kN] for single anchor

Anchor size		W-UR 10 SymCon	W-UR 14 SymCon
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Hollow brick HLz, $f_b \geq 6 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	1.2
Characteristic resistance F_{Rk}	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	1.2
Hollow brick HLz, $f_b \geq 8 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	1.5
Characteristic resistance F_{Rk}	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	1.5
Hollow brick HLz, $f_b \geq 10 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	2.0
Characteristic resistance F_{Rk}	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	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 4.2.6 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 SymCon

Hollow brick HLz, 12DF

Brick data, installation parameters, characteristic resistance

Annex 20

Base material hollow masonry: Hollow brick HLz, T14-24,0

Table 10.5.1: Brick data

Description of brick		771-1-048	HLz T14-24,0
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm ³]	0.7
Standard, approval			EN 771-1, Z-17.1-651
Producer of brick			Wienerberger GmbH Oldenburger Allee 26 D-30659 Hannover
Format (measurement)		[mm]	$\geq 10DF (\geq 308 \times 240 \times 249)$
Minimum thickness of member	$h_{min} =$	[mm]	240

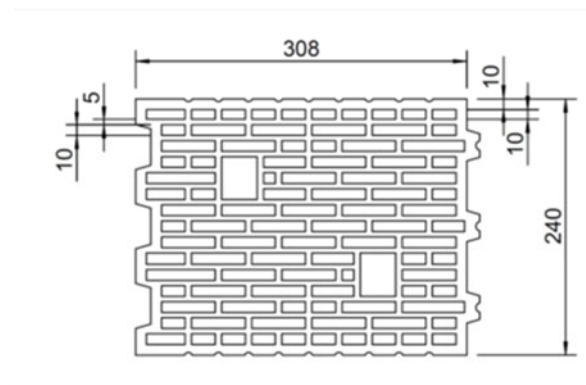


Table 10.5.2: Installation parameters

Anchor size			W-UR 14 SymCon
Drill hole diameter	$d_0 =$	[mm]	14
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	14.45
Depth of drill hole to deepest point	$h_f \geq$	[mm]	110
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	100
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	14.5
Minimum allowable edge distance	$c_{min} \geq$	[mm]	100

Table 10.5.3: Characteristic resistance F_{Rk} ¹⁾ in [kN] for single anchor

Anchor size			W-UR 14 SymCon
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	100
Hollow brick HLz T14-24,0, $f_b \geq 6 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	0.6
Characteristic resistance F_{Rk}	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.6
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 4.2.6 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 SymCon

Hollow brick HLz, T14-24,0

Brick data, installation parameters, characteristic resistance

Annex 21

Base material hollow masonry: Hollow brick POROTON-T8-30,0-P

Table 10.6.1: Brick data

Description of brick		771-1-022	POROTON-T8-30,0-P
Type of brick			Hollow brick POROTON-T8-P
Bulk density	$\rho \geq$	[kg/dm ³]	0.6
Standard, approval			T8: EN 771-1; Z-17.1-982
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

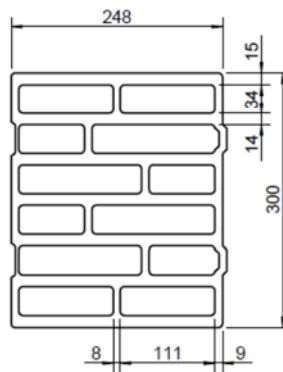


Table 10.6.2: Installation parameters

Anchor size		W-UR 10 SymCon	W-UR 14 SymCon
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			Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	10.5
Minimum allowable edge distance	$c_{\min} \geq$	[mm]	65

Table 10.6.3: Characteristic resistance F_{Rk} ¹⁾ in [kN] for single anchor

Anchor size		W-UR 10 SymCon	W-UR 14 SymCon
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70
POROTON-T8-30,0-P, $f_b \geq 4 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	0.6
Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]	0.6
POROTON-T8-30,0-P, $f_b \geq 6 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	0.9
Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]	0.9
POROTON-T8-30,0-P, $f_b \geq 8 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	0.9
Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]	0.9
Partial safety factor	γ_{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 4.2.6 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 SymCon

Hollow brick: POROTON-T8-30,0-P

Brick data, installation parameters, characteristic resistance

Annex 22

Base material hollow masonry: Hollow brick POROTON-T9-30,0-P

Table 10.7.1: Brick data

Description of brick		771-1-045	POROTON-T9-30,0-P
Type of brick			Hollow brick POROTON-T9-P
Bulk density	$\rho \geq$	[kg/dm ³]	0.6
Standard, approval			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

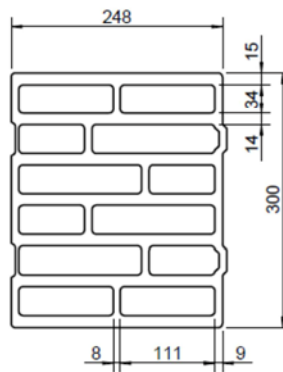


Table 10.7.2: Installation parameters

Anchor size			W-UR 14 SymCon
Drill hole diameter	$d_0 =$	[mm]	14
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	14.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	110
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	100
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	14.5
Minimum allowable edge distance	$c_{\text{min}} \geq$	[mm]	100

Table 10.7.3: Characteristic resistance F_{Rk} ¹⁾ in [kN] for single anchor

Anchor size			W-UR 14 SymCon
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	100
POROTON-T9-30,0-P, $f_b \geq 6 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	1.5
Characteristic resistance F_{Rk}	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	1.5
POROTON-T9-30,0-P, $f_b \geq 8 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	2.0
Characteristic resistance F_{Rk}	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	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 4.2.6 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 SymCon

Hollow brick: POROTON-T9-30,0-P

Brick data, installation parameters, characteristic resistance

Annex 23

Base material hollow masonry: Hollow brick POROTON S10

Table 10.8.1: Brick data

Description of brick		771-1-032	POROTON S10
Type of brick			Hollow brick POROTON S10
Bulk density	$\rho \geq$	[kg/dm ³]	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

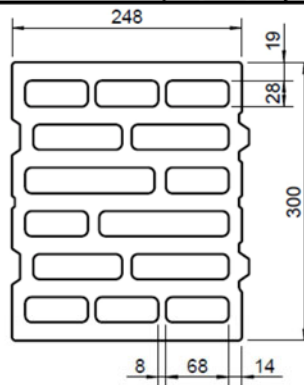


Table 10.8.2: Installation parameters

Anchor size			W-UR 14 SymCon
Drill hole diameter	$d_0 =$	[mm]	14
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	14.45
Depth of drill hole to deepest point	$h_f \geq$	[mm]	110
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	100
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	14.5
Minimum allowable edge distance	$c_{\text{min}} \geq$	[mm]	100

Table 10.8.3: Characteristic resistance F_{Rk} ¹⁾ in [kN] for single anchor

Anchor size			W-UR 14 SymCon
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	100
POROTON S10-30, $f_b \geq 8 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	1.5
Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]	1.5
Partial safety factor	γ_{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 4.2.6 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 SymCon

Hollow brick: POROTON S10

Brick data, installation parameters, characteristic resistance

Annex 24

Base material hollow masonry: Hollow brick POROTON S11

Table 10.9.1: Brick data

Description of brick		771-1-046	POROTON S11-30,0-P
Type of brick			Hollow brick POROTON S11-30,0-P
Bulk density	$\rho \geq$	[kg/dm ³]	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

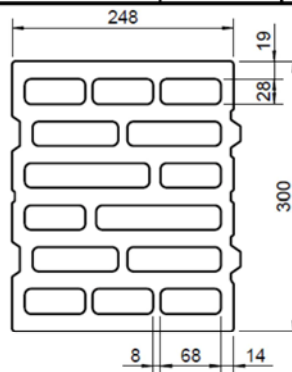


Table 10.9.2: Installation parameters

Anchor size			W-UR 14 SymCon
Drill hole diameter	$d_0 =$	[mm]	14
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	14.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	110
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	100
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	14.5
Minimum allowable edge distance	$c_{min} \geq$	[mm]	100

Table 10.9.3: Characteristic resistance F_{Rk} ¹⁾ in [kN] for single anchor

Anchor size			W-UR 14 SymCon
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	100
POROTON S11-30-P, $f_b \geq 8 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	2.5
Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]	2.5
Partial safety factor	γ_{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 4.2.6 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 SymCon

Hollow brick: POROTON S11-30,0-P

Brick data, installation parameters, characteristic resistance

Annex 25

Base material hollow masonry: Hollow brick ThermoPlan MZ10

Table 10.10.1: Brick data

Brick data		771-1-034	ThermoPlan MZ10
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm ³]	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

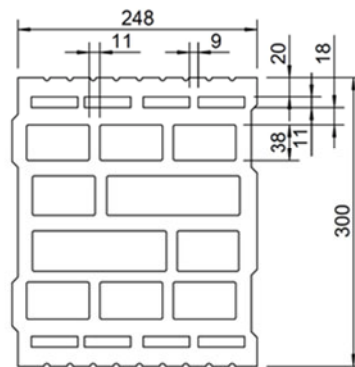


Table 10.10.2: Installation parameters

Anchor size		W-UR 14 SymCon	
Drill hole diameter	$d_o =$	[mm]	14
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	14.45
Depth of drill hole to deepest point	$h_f \geq$	[mm]	80 110
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	≥ 70 100
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	14.5
Minimum allowable edge distance	$c_{min} \geq$	[mm]	100

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

Anchor size		W-UR 14 SymCon	
Overall plastic anchor embedment depth	h_{nom}	[mm]	≥ 70 ⁵⁾ = 100
Hollow brick ThermoPlan MZ10, $f_b \geq 8 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	2.0 2.5
	50°C ³⁾ / 80°C ⁴⁾	[kN]	2.0 2.5
Characteristic resistance F_{Rk}			
Partial safety factor	γ_{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 4.2.6 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 $70 \text{ mm} \leq h_{nom} < 100 \text{ mm}$ (see Annex 8, Table 3.2).
For Plastic anchors W-UR 14 SymCon set variable in this range no additional job site tests have necessarily to be performed.

Würth Plastic Anchor W-UR SymCon

Hollow brick: ThermoPlan MZ10

Brick data, installation parameters, characteristic resistance

Annex 26

Base material hollow masonry: Hollow brick ThermoPlan TS²

Table 10.11.1: Brick data

Brick data		771-1-024	ThermoPlan TS ²
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm ³]	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

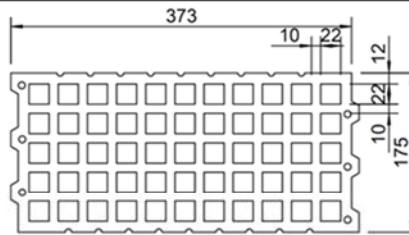


Table 10.11.2: Installation parameters

Anchor size		W-UR 14 SymCon	
Drill hole diameter	$d_0 =$	[mm]	14
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	14.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80 110
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	70 100
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	14.5
Minimum allowable edge distance	$c_{min} \geq$	[mm]	100

Table 10.11.3: Characteristic resistance F_{Rk} ¹⁾ in [kN] for single anchor

Anchor size		W-UR 14 SymCon	
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	$70 \text{ mm} \leq h_{nom} \leq 100 \text{ mm}$ ⁵⁾
Hollow brick ThermoPlan TS ² , $f_b \geq 6 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	0.4
Characteristic resistance F_{Rk}	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.4
Hollow brick ThermoPlan TS ² , $f_b \geq 8 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	0.6
Characteristic resistance F_{Rk}	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.6
Hollow brick ThermoPlan TS ² , $f_b \geq 10 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	0.75
Characteristic resistance F_{Rk}	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.75
Hollow brick ThermoPlan TS ² , $f_b \geq 12 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	0.9
Characteristic resistance F_{Rk}	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.9
Hollow brick ThermoPlan TS ² , $f_b \geq 20 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[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 4.2.6 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

5) The influence of $h_{nom} > 100 \text{ mm}$ has to be detected by job site tests according 4.4.

Würth Plastic Anchor W-UR SymCon

Hollow brick: ThermoPlan TS²

Brick data, installation parameters, characteristic resistance

Annex 27

Base material hollow masonry: Hollow brick THERMOPOR TV 9-Plan

Table 10.12.1: Brick data

Brick data		771-1-029	THERMOPOR TV 9-Plan
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm ³]	0.75
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

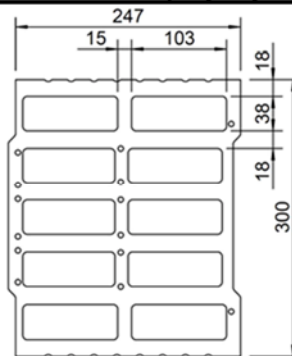


Table 10.12.2: Installation parameters

Anchor size			W-UR 14 SymCon
Drill hole diameter	$d_0 =$	[mm]	14
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	14.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	110
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	100
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	14.5
Minimum allowable edge distance	$c_{\text{min}} \geq$	[mm]	100

Table 10.12.3: Characteristic resistance F_{Rk} ¹⁾ in [kN] for single anchor

Anchor size			W-UR 14 SymCon
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	100
Hollow brick THERMOPOR TV 9-Plan, $f_b \geq 4 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	0.9
	50°C ³⁾ / 80°C ⁴⁾	[kN]	0.9
Hollow brick THERMOPOR TV 9-Plan, $f_b \geq 6 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	1.5
	50°C ³⁾ / 80°C ⁴⁾	[kN]	1.5
Hollow brick THERMOPOR TV 9-Plan, $f_b \geq 8 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	2.0
	50°C ³⁾ / 80°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 4.2.6 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 SymCon

Hollow brick: THERMOPOR TV 9-Plan

Brick data, installation parameters, characteristic resistance

Annex 28

Base material solid masonry, sand-lime solid brick KS, NF

Table 10.13.1: Brick data

Description of brick		771-2-011	KS
Type of brick			Sand-lime solid brick
Bulk density	$\rho \geq$	[kg/dm ³]	2.0
Standard, approval			DIN V 106; EN 771-2
Producer of brick			e.g. Xella International GmbH Dr.-Hammacher-Str. 49 D-47119 Duisburg
Format (measurement)		[mm]	\geq NF ($\geq 240 \times 115 \times 71$)
Minimum thickness of member	$h_{\min} =$	[mm]	115

Table 10.13.2: Installation parameters

Anchor size			W-UR 10 SymCon
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 allowable edge distance	$c_{\text{min}} \geq$	[mm]	90

Table 10.13.3: Characteristic resistance F_{Rk} ¹⁾ in [kN] for single anchor

Anchor size			W-UR 10 SymCon
Overall plastic anchor embedment depth	h_{nom}	[mm]	≥ 70
Sand-lime solid brick KS, $f_b \geq 10 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	1.2
	50°C ³⁾ / 80°C ⁴⁾	[kN]	1.2
Characteristic resistance F_{Rk}			
Sand-lime solid brick KS, $f_b \geq 20 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	2.0
	50°C ³⁾ / 80°C ⁴⁾	[kN]	2.0
Characteristic resistance F_{Rk}			
Partial safety factor	γ_{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 4.2.6 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 SymCon

Sand-lime solid brick KS, NF

Brick data, installation parameters, characteristic resistance

Annex 29

Base material solid masonry, sand-lime solid brick Silka XL Basic, Silka XL Plus

Table 10.14.1: Brick data

Description of brick	771-2-010	Silka XL Basic, Silka XL Plus
Type of brick		Sand-lime solid brick
Bulk density $\rho \geq$	[kg/dm ³]	2.0
Standard, approval		DIN V 106; EN 771-2, Z-17.1-997
Producer of brick		Xella International 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 10.14.2: Installation parameters

Anchor size	W-UR 14 SymCon
Drill hole diameter $d_0 =$	14
Cutting diameter of drill bit $d_{\text{cut}} \leq$	14.45
Depth of drill hole to deepest point $h_1 \geq$	80 110
Drill method	Hammer drilling
Overall plastic anchor embedment depth $h_{\text{nom}} \geq$	70 100
Diameter of clearance hole in the fixture $d_f \leq$	14.5
Minimum allowable edge distance $c_{\min} \geq$	100 100 60

Table 10.14.3: Characteristic resistance F_{Rk} ¹⁾ in [kN] for single anchor

Anchor size	W-UR 14 SymCon
Overall plastic anchor embedment depth h_{nom}	≥ 70 = 100
Minimum allowable edge distance $c_{\min} \geq$	100 100 60
Sand-lime solid brick Silka XL Basic, Silka XL Plus, $f_b \geq 10 \text{ N/mm}^2$	
Characteristic resistance F_{Rk} $30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	3.0 3.0 2.5
Characteristic resistance F_{Rk} $50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	3.0 3.0 2.5
Sand-lime solid brick Silka XL Basic, Silka XL Plus, $f_b \geq 20 \text{ N/mm}^2$	
Characteristic resistance F_{Rk} $30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	4.5 4.5 3.5
Characteristic resistance F_{Rk} $50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	4.5 4.5 3.5
Sand-lime solid brick Silka XL Basic, Silka XL Plus, $f_b \geq 28 \text{ N/mm}^2$	
Characteristic resistance F_{Rk} $30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	6.0 6.5 5.0
Characteristic resistance F_{Rk} $50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	6.0 6.5 5.0
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 4.2.6 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 SymCon

Sand-lime solid brick Silka XL Basic, Silka XL Plus
Brick data, installation parameters, characteristic resistance

Annex 30

Base material hollow masonry, sand-lime perforated brick KS L, 2DF

Table 10.15.1: Brick data

Description of brick		771-2-004	KS L
Type of brick			Sand-lime perforated brick
Bulk density	$\rho \geq$	[kg/dm ³]	1.4
Standard, approval			DIN 106; EN 771-2
Producer of brick			e.g. Xella International GmbH
Format (measurement)		[mm]	$\geq 2DF (\geq 240 \times 115 \times 113)$
Minimum thickness of member	$h_{min} =$	[mm]	115

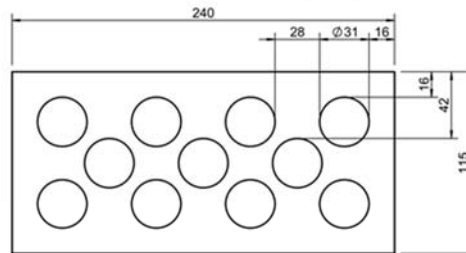


Table 10.15.2: Installation parameters

Anchor size			W-UR 10 SymCon
Drill hole diameter	$d_0 =$	[mm]	10
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	10.45
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]	10.5
Minimum allowable edge distance	$c_{min} \geq$	[mm]	90

Table 10.15.3: Characteristic resistance F_{Rk} ¹⁾ in [kN] for single anchor

Anchor size			W-UR 10 SymCon
Overall plastic anchor embedment depth	$h_{nom} \geq$	[mm]	70
Sand-lime perforated brick KS L, $f_b \geq 6 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	1.2
	Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]
Sand-lime perforated brick KS L, $f_b \geq 8 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	1.5
	Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]
Sand-lime perforated brick KS L, $f_b \geq 10 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	2.0
	Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]
Sand-lime perforated brick KS L, $f_b \geq 12 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	2.5
	Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]
Partial safety factor	γ_{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 4.2.6 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 SymCon

Sand-lime perforated brick KS L, 2DF

Brick data, installation parameters, characteristic resistance

Annex 31

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

Table 10.16.1: Brick data

Description of brick		771-2-013	KS L
Type of brick			Sand-lime perforated brick
Bulk density	$\rho \geq$	[kg/dm ³]	1.4
Standard, approval			DIN 106; EN 771-2
Producer of brick			e.g. Xella International GmbH
Format (measurement)		[mm]	$\geq 8DF (\geq 248 \times 240 \times 238)$
Minimum thickness of member	$h_{min} =$	[mm]	240

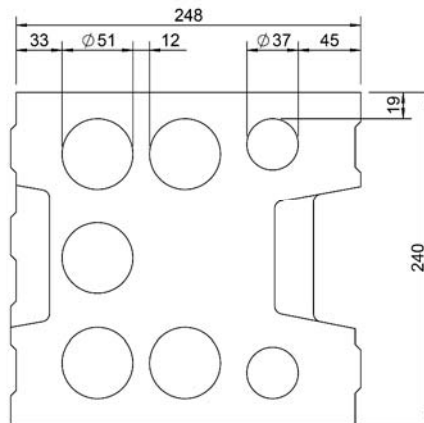


Table 10.16.2: Installation parameters

Anchor size		W-UR 10 SymCon	W-UR 14 SymCon
Drill hole diameter	$d_0 =$	[mm]	10
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	10.45
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]	10.5
Minimum allowable edge distance	$c_{min} \geq$	[mm]	60

Table 10.16.3: Characteristic resistance F_{Rk} ¹⁾ in [kN] for single anchor

Anchor size		W-UR 10 SymCon	W-UR 14 SymCon
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	70
Sand-lime perforated brick KS L, $f_b \geq 6 \text{ N/mm}^2$, Characteristic resistance F_{Rk}	30°C ³⁾ / 50°C ⁴⁾	[kN]	0.9
	50°C ³⁾ / 80°C ⁴⁾	[kN]	0.75
Sand-lime perforated brick KS L, $f_b \geq 8 \text{ N/mm}^2$, Characteristic resistance F_{Rk}	30°C ³⁾ / 50°C ⁴⁾	[kN]	1.2
	50°C ³⁾ / 80°C ⁴⁾	[kN]	0.9
Sand-lime perforated brick KS L, $f_b \geq 10 \text{ N/mm}^2$, Characteristic resistance F_{Rk}	30°C ³⁾ / 50°C ⁴⁾	[kN]	1.5
	50°C ³⁾ / 80°C ⁴⁾	[kN]	1.2
Sand-lime perforated brick KS L, $f_b \geq 12 \text{ N/mm}^2$, Characteristic resistance F_{Rk}	30°C ³⁾ / 50°C ⁴⁾	[kN]	2.0
	50°C ³⁾ / 80°C ⁴⁾	[kN]	1.5
Partial safety factor	γ_{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 4.2.6 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 SymCon

Sand-lime perforated brick KS L, 8DF

Brick data, installation parameters, characteristic resistance

Annex 32

Base material hollow masonry, sand-lime perforated brick KS L, 9DF

Table 10.17.1: Brick data

Description of brick		771-2-008	KS L
Type of brick			Sand-lime perforated brick
Bulk density	$\rho \geq$	[kg/dm ³]	1.4
Standard, approval			DIN 106; EN 771-2
Producer of brick			Xella International GmbH Dr.-Hammacher-Str.49 D-47119 Duisburg
Format (measurement)		[mm]	$\geq 9DF (\geq 373 \times 175 \times 238)$
Minimum thickness of member	$h_{min} =$	[mm]	175

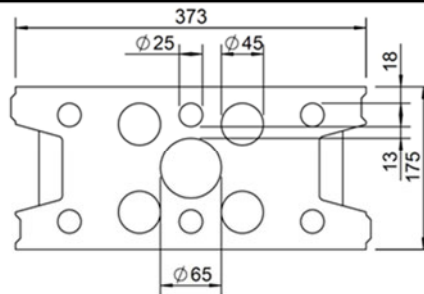


Table 10.17.2: Installation parameters

Anchor size		W-UR 14 SymCon	
Drill hole diameter	$d_0 =$	[mm]	14
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	14.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80 110
Drill method		[-]	Rotary drilling
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	≥ 70 100
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	14.5
Minimum allowable edge distance	$c_{min} \geq$	[mm]	100

Table 10.17.3: Characteristic resistance $F_{Rk}^{1)}$ in [kN] for single anchor

Anchor size		W-UR 14 SymCon	
Overall plastic anchor embedment depth	h_{nom}	[mm]	$\geq 70^{5)}$ = 100
Sand-lime perforated brick KS L, $f_b \geq 6 \text{ N/mm}^2$, Characteristic resistance F_{Rk}	$30^\circ\text{C}^{3)}) / 50^\circ\text{C}^{4)})$	[kN]	0.5 0.9
	$50^\circ\text{C}^{3)}) / 80^\circ\text{C}^{4)})$	[kN]	0.5 0.9
Sand-lime perforated brick KS L, $f_b \geq 8 \text{ N/mm}^2$, Characteristic resistance F_{Rk}	$30^\circ\text{C}^{3)}) / 50^\circ\text{C}^{4)})$	[kN]	0.6 1.2
	$50^\circ\text{C}^{3)}) / 80^\circ\text{C}^{4)})$	[kN]	0.6 1.2
Sand-lime perforated brick KS L, $f_b \geq 10 \text{ N/mm}^2$, Characteristic resistance F_{Rk}	$30^\circ\text{C}^{3)}) / 50^\circ\text{C}^{4)})$	[kN]	0.75 1.5
	$50^\circ\text{C}^{3)}) / 80^\circ\text{C}^{4)})$	[kN]	0.75 1.5
Sand-lime perforated brick KS L, $f_b \geq 12 \text{ N/mm}^2$, Characteristic resistance F_{Rk}	$30^\circ\text{C}^{3)}) / 50^\circ\text{C}^{4)})$	[kN]	0.9 2.0
	$50^\circ\text{C}^{3)}) / 80^\circ\text{C}^{4)})$	[kN]	0.9 2.0
Sand-lime perforated brick KS L, $f_b \geq 20 \text{ N/mm}^2$, Characteristic resistance F_{Rk}	$30^\circ\text{C}^{3)}) / 50^\circ\text{C}^{4)})$	[kN]	1.5 3.0
	$50^\circ\text{C}^{3)}) / 80^\circ\text{C}^{4)})$	[kN]	1.5 3.0
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 4.2.6 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 $70 \text{ mm} \leq h_{nom} < 100 \text{ mm}$ (see Annex 8, Table 3.2). For Plastic anchors W-UR 14 SymCon set variable in this range no additional job site tests have necessarily to be performed.

Würth Plastic Anchor W-UR SymCon

Sand-lime perforated brick KS L, 9DF

Brick data, installation parameters, characteristic resistance

Annex 33

Base material solid masonry, Concrete solid block Vn and Vbn, NF

Table 10.18.1: Brick data

Description of brick		771-3-004 (a)	Vn and Vbn
Type of brick			Concrete solid block
Bulk density	$\rho \geq$	[kg/dm ³]	2.0
Standard, approval			DIN 18153-100; EN 771-3
Producer of brick			-
Format (measurement)		[mm]	\geq NF (\geq 240x115x71)
Minimum thickness of member	$h_{\min} =$	[mm]	115

Table 10.18.2: Installation parameters

Anchor size			W-UR 10 SymCon	W-UR 14 SymCon
Drill hole diameter	$d_0 =$	[mm]	10	14
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	10.45	14.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80	80
Drill method		[-]	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]	10.5	14.5
Minimum allowable edge distance	$c_{\text{min}} \geq$	[mm]	80	240

Table 10.18.3: Characteristic resistance F_{Rk} ¹⁾ in [kN] for single anchor

Anchor size			W-UR 10 SymCon	W-UR 14 SymCon
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$	[mm]	70	70
Concrete solid block Vn and Vbn, $f_b \geq 10 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	1.5	2.0
	Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]	1.5
Concrete solid block Vn and Vbn, $f_b \geq 20 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	2.5	3.0
	Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]	2.5
Concrete solid block Vn and Vbn, $f_b \geq 28 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	4.0	4.5
	Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]	4.0
Partial safety factor	γ_{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 4.2.6 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 SymCon

Concrete solid block Vn and Vbn, NF
Brick data, installation parameters, characteristic resistance

Annex 34

Base material solid masonry, Lightweight concrete solid block V and Vbl, 3DF

Table 10.19.1: Brick data

Description of brick		771-3-017	V and Vbl
Type of brick			Lightweight concrete solid block
Bulk density	$\rho \geq$	[kg/dm ³]	2.0
Standard, approval			EN 771-3, DIN V 18152-100
Producer of brick			e.g. Bisophon Bisotherm GmbH Eisenbahnstraße 12 D-56218 Mülheim-Kärlich
Format (measurement)		[mm]	$\geq 3DF (\geq 240 \times 175 \times 113)$
Minimum thickness of member	$h_{min} =$	[mm]	175

Table 10.19.2: Installation parameters

Anchor size		W-UR 10 SymCon	W-UR 14 SymCon
Drill hole diameter	$d_o =$	[mm]	10
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	10.45
Depth of drill hole to deepest point	$h_f \geq$	[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]	10.5
Minimum allowable edge distance	$c_{min} \geq$	[mm]	50

Table 10.19.3: Characteristic resistance F_{Rk} ¹⁾ in [kN] for single anchor

Anchor size		W-UR 10 SymCon	W-UR 14 SymCon
Overall plastic anchor embedment depth	$h_{nom} \geq$	[mm]	70
Lightweight concrete solid block V and Vbl, $f_b \geq 10 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	3.0
	50°C ³⁾ / 80°C ⁴⁾	[kN]	4.0
Lightweight concrete solid block V and Vbl, $f_b \geq 20 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	4.5
	50°C ³⁾ / 80°C ⁴⁾	[kN]	5.5
Partial safety factor	γ_{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 4.2.6 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 SymCon

Lightweight concrete solid block V and Vbl, 3DF
Brick data, installation parameters, characteristic resistance

Annex 35

Base material solid masonry, Lightweight concrete solid brick V and Vbl, NF

Table 10.20.1: Brick data

Description of brick		771-3-007	V and Vbl
Type of brick			Lightweight concrete solid brick
Bulk density	$\rho \geq$	[kg/dm ³]	1.0
Standard, approval			EN 771-3, DIN V 18152-100
Producer of brick			e.g. BisoBims, Bisotherm GmbH Eisenbahnstraße 12 D-56218 Mülheim-Kärlich
Format (measurement)		[mm]	\geq NF (\geq 240x115x71)
Minimum thickness of member	$h_{\min} =$	[mm]	115

Table 10.20.2: Installation parameters

Anchor size			W-UR 14 SymCon
Drill hole diameter	$d_0 =$	[mm]	14
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	14.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	110
Drill method		[-]	Hammer drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$	[mm]	100
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	14.5
Minimum allowable edge distance	$c_{\text{min}} \geq$	[mm]	240

Table 10.20.3: Characteristic resistance F_{Rk} ¹⁾ in [kN] for single anchor

Anchor size			W-UR 14 SymCon
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$	[mm]	100
Lightweight concrete solid brick V 2 and Vbl 2, $f_b \geq 2 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	1.2
	Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]
Lightweight concrete solid brick V 4 and Vbl 4, $f_b \geq 4 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	2.5
	Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]
Partial safety factor	γ_{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 4.2.6 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 SymCon

Lightweight concrete solid brick V and Vbl, NF
Brick data, installation parameters, characteristic resistance

Annex 36

Base material solid masonry, Lightweight concrete solid brick V and Vbl, 3DF

Table 10.21.1: Brick data

Description of brick		771-3-016	V and Vbl
Type of brick			Lightweight concrete solid brick
Bulk density	$\rho \geq$	[kg/dm ³]	1.0
Standard, approval			EN 771-3, DIN V 18152-100
Producer of brick			e.g. BasisBims, Bisotherm GmbH Eisenbahnstraße 12 D-56218 Mülheim-Kärlich
Format (measurement)		[mm]	$\geq 3DF (\geq 240 \times 175 \times 71)$
Minimum thickness of member	$h_{min} =$	[mm]	175

Table 10.21.2: Installation parameters

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

Table 10.21.3: Characteristic resistance F_{Rk} ¹⁾ in [kN] for single anchor

Anchor size			W-UR 10 SymCon
Overall plastic anchor embedment depth	$h_{nom} \geq$	[mm]	70
Lightweight concrete solid brick V 2 and Vbl 2, $f_b \geq 2 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	0.5
	Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]
Lightweight concrete solid brick V 4 and Vbl 4, $f_b \geq 4 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	0.9
	Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]
Partial safety factor	γ_{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 4.2.6 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 SymCon

Lightweight concrete solid brick V and Vbl, 3DF
Brick data, installation parameters, characteristic resistance

Annex 37

Base material hollow brick lightweight concrete 3K Hbl

Table 10.22.1: Brick data

Description of brick		771-3-005	3K Hbl
Type of brick			Hollow brick lightweight concrete 3K Hbl
Bulk density	$\rho \geq$	[kg/dm ³]	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

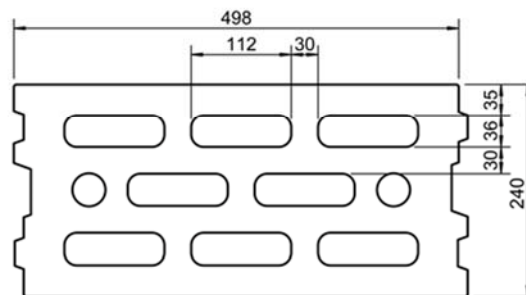


Table 10.22.2: Installation parameters

Anchor size			W-UR 10 SymCon	W-UR 14 SymCon
Drill hole diameter	$d_0 =$	[mm]	10	14
Cutting diameter of drill bit	$d_{\text{cut}} \leq$	[mm]	10.45	14.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80	110
Drill method		[-]	Rotary drilling	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	70	100
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	10.5	14.5
Minimum allowable edge distance	$c_{\text{min}} \geq$	[mm]	65	100

Table 10.22.3: Characteristic resistance F_{Rk} ¹⁾ in [kN] for single anchor

Anchor size			W-UR 10 SymCon	W-UR 14 SymCon
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	70	100
Hollow brick lightweight concrete	30°C ³⁾ / 50°C ⁴⁾	[kN]	0.6	0.6
3K Hbl, $f_b \geq 2 \text{ N/mm}^2$				
Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]	0.6	0.5
Hollow brick lightweight concrete	30°C ³⁾ / 50°C ⁴⁾	[kN]	1.2	1.2
3K Hbl, $f_b \geq 4 \text{ N/mm}^2$				
Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]	1.2	0.9
Hollow brick lightweight concrete	30°C ³⁾ / 50°C ⁴⁾	[kN]	1.2	1.5
3K Hbl, $f_b \geq 6 \text{ N/mm}^2$				
Characteristic resistance F_{Rk}	50°C ³⁾ / 80°C ⁴⁾	[kN]	1.2	1.5
Partial safety factor	γ_{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 4.2.6 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 SymCon

Hollow brick lightweight concrete 3K Hbl

Brick data, installation parameters, characteristic resistance

Annex 38

Base material solid masonry: Autoclaved Aerated AAC

Table 10.23.1: Brick data

Description of brick		771-3-005	AAC
Type of brick			Autoclaved Aerated Concrete
Bulk density	$\rho \geq$	[kg/dm ³]	0.3
Standard, approval			DIN 4165; EN 771-4
Format (measurement)		[mm]	$\geq 499 \times 100 \times 249$
Minimum thickness of member	$h_{\min} =$	[mm]	100

Table 10.23.2: Installation parameters

Anchor size			W-UR 10 SymCon
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	$h_{\text{nom}} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	10.5

Table 10.23.3: Characteristic resistance $F_{Rk}^{1)}$ in [kN] for single anchor

Anchor size			W-UR 10 SymCon
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	70
Autoclaved Aerated Concrete AAC $f_b \geq 2 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	0.6
	50°C ³⁾ / 80°C ⁴⁾	[kN]	0.5
Autoclaved Aerated Concrete AAC $f_b \geq 3 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	0.89
	50°C ³⁾ / 80°C ⁴⁾	[kN]	0.73
Autoclaved Aerated Concrete AAC $f_b \geq 4 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	1.17
	50°C ³⁾ / 80°C ⁴⁾	[kN]	0.95
Autoclaved Aerated Concrete AAC $f_b \geq 5 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	1.46
	50°C ³⁾ / 80°C ⁴⁾	[kN]	1.18
Autoclaved Aerated Concrete AAC $f_b \geq 6 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	1.74
	50°C ³⁾ / 80°C ⁴⁾	[kN]	1.4
Autoclaved Aerated Concrete AAC $f_b \geq 7 \text{ N/mm}^2$	30°C ³⁾ / 50°C ⁴⁾	[kN]	1.74
	50°C ³⁾ / 80°C ⁴⁾	[kN]	1.4
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	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 4.2.6 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 SymCon

Solid masonry: Autoclaved Aerated Concrete
Brick data, installation parameters, characteristic resistance

Annex 39

Base material precast prestressed hollow core elements

Table 10.24.1: Data

Description	Precast prestressed hollow core elements
Base material	Precast prestressed hollow core elements ≥ C30/37
Standard, approval	DIN EN 1168: 2008-10

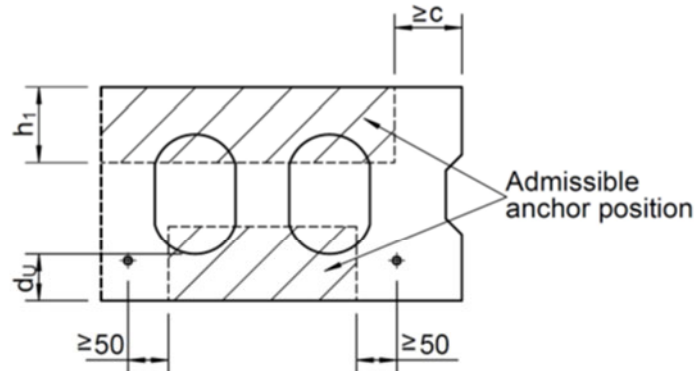


Table 10.24.2: Installation parameters

Anchor size	W-UR 10 SymCon
Member thickness $d_u \geq$ [mm]	25 40
Drill hole diameter d_0 [mm]	10
Cutting diameter of drill bit $d_{cut} \leq$ [mm]	10.45
Depth of drill hole to deepest point $h_1 \geq$ [mm]	80
Drill method	Hammer drilling
Overall plastic anchor embedment depth $h_{nom} =$ [mm]	≥ 50 / ≤ 70 ≥ 50 / ≤ 70
Diameter of clearance hole in the fixture $d_f \leq$ [mm]	10.5

Table 10.24.3: Characteristic resistance $F_{Rk}^{1)}$ in [kN] for single anchor

Anchor size	W-UR 10 SymCon
Member thickness $d_u \geq$ [mm]	25 40
Precast prestressed hollow core elements ≥ C30/37 $30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$ [kN]	1.5 5.0
Characteristic resistance F_{Rk} $50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	1.2 4.0
Partial safety factor $\gamma_{Mm}^{2)}$ [-]	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 8 (concrete). The specific conditions for the design method have to be considered according to chapter 4.2.6 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 SymCon

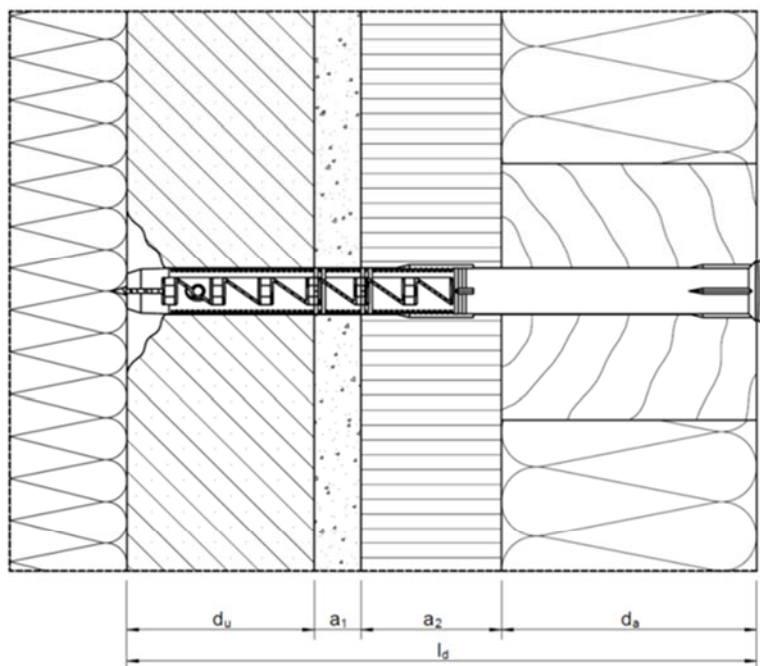
Precast prestressed hollow core elements ≥ C30/37
Brick data, installation parameters, characteristic resistance

Annex 40

Base material weather resistant skins of external wall panels made of concrete

Table 10.25.1: Data

Description	Weather resistant skins of external wall panels made of concrete
Base material	Weather resistant skins of external wall panels made of concrete \geq C16/20



- d_u : Thickness of weather resistant skin of external wall panel
 a_1 : Thickness of non-load-bearing layer
 a_2 : Tolerance adjustment of facade surface
 d_a : Thickness of fixture
 l_d : Length of plastic sleeve

$$l_d \geq d_a + 40 \text{ mm} + \max a_1 + \max a_2$$

$$l_d \leq d_a + 70 \text{ mm} + \min a_1 + \min a_2$$

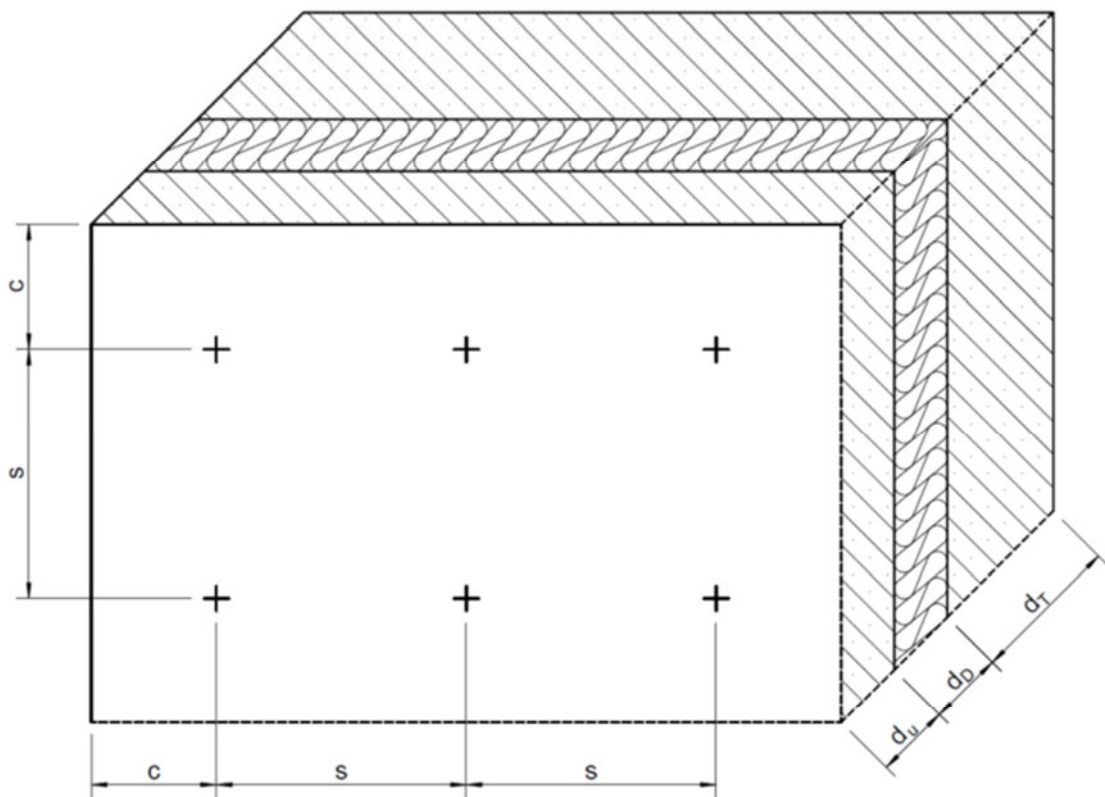
Table 10.25.2: Installation parameters

Anchor size			W-UR 10 SymCon
Member thickness	$d_u \geq$	[mm]	40
Drill hole diameter	d_0	[mm]	10
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	10.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Hammer drilling
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	10.5

Würth Plastic Anchor W-UR SymCon

Weather resistant skins of external wall panels made of concrete \geq C16/20
Brick data, installation parameters, characteristic resistance

Annex 41



- d_u : Thickness of weather resistant skin of external wall panel
 d_D : Thickness of insulation
 d_T : Thickness of member
 c : Edge distance
 s : Spacing

Table 10.25.3: Characteristic resistance F_{Rk} ¹⁾ in [kN] for single anchor

Anchor size			W-UR 10 SymCon
Member thickness	$d_u \geq$	[mm]	40
Weather resistant skins of external wall panels made of concrete \geq C16/20, Characteristic resistance F_{Rk}	30°C ³⁾ / 50°C ⁴⁾	[kN]	1.5
	50°C ³⁾ / 80°C ⁴⁾	[kN]	1.2
Partial safety factor	γ_{Mm} 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 4.2.6 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 SymCon

Weather resistant skins of external wall panels made of concrete \geq C16/20
Brick data, installation parameters, characteristic resistance

Annex 42