



European Technical Approval ETA-11/0309

English translation prepared by DIBt - Original version in German language

Handelsbezeichnung <i>Trade name</i>	Würth Kunststoff-Rahmendübel W-UR SymCon <i>Würth Plastic Anchor W-UR SymCon</i>
Zulassungsinhaber <i>Holder of approval</i>	Adolf Würth GmbH & Co. KG Reinhold-Würth-Straße 12 -17 74653 Künzelsau DEUTSCHLAND
Zulassungsgegenstand und Verwendungszweck <i>Generic type and use of construction product</i>	Kunststoffdübel als Mehrfachbefestigung von nichttragenden Systemen zur Verankerung im Beton und Mauerwerk <i>Plastic anchor for multiple use in concrete and masonry for non-structural applications</i>
Geltungsdauer: <i>Validity:</i>	vom <i>from</i> bis <i>to</i>
Herstellwerk <i>Manufacturing plant</i>	Herstellwerk 2
	29 August 2011 29 August 2016

Diese Zulassung umfasst
This Approval contains

37 Seiten einschließlich 26 Anhänge
37 pages including 26 annexes

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 law of 31 October 2006⁵;
 - 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.
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- 6 The European technical approval is issued by the approval body in its official language. This version corresponds fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

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* 2006, p. 2407, 2416
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 SymCon and W-UR 14 SymCon is a plastic anchor consisting of a plastic sleeve made of polyamide and an accompanying specific screw of galvanised steel or of stainless steel.

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

The installed anchor is shown in Annex 1 and 2.

1.2 Intended use

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

The anchor is to be used only for multiple fixing for non-structural applications.

The base material for the anchor sizes W-UR 6 SymCon and W-UR 14 SymCon shall consist of reinforced or unreinforced normal weight concrete of strength class C12/15 at minimum according to EN 206-1:2000-12. The anchor may be used in cracked and non-cracked concrete.

The base material for the anchor size W-UR 14 SymCon may also consist of masonry walls according to Annex 6 and 7. The mortar strength class of the masonry has to be M2,5 according to EN 998-2:2003 at minimum.

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

The specific screw made of stainless steel may be used in structures subject to dry internal conditions and also in structures subject to external atmospheric exposure (including industrial and marine environment), or exposure in permanently damp internal conditions, if no particular aggressive conditions exist. Such particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with extreme chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used).

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

The anchor W-UR 14 SymCon 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).

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

2 Characteristics of the product and methods of verification

2.1 Characteristics of the product

The anchor corresponds to the drawings and information given in Annex 3, 4 and 5. The characteristic material values, dimensions and tolerances of the anchor not given in these Annexes shall correspond to the respective values laid down in the technical documentation⁷ of this European Technical Approval.

The characteristic values for the design of the anchorages are given in Annex 6, Annex 9 and Annex 11 to 26.

Each anchor is to be marked with the identifying mark, the type, the diameter and the length of the anchor according to Annex 3. The special screws are marked according Annex 4.

The minimum embedment depth shall be marked.

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

2.2 Methods of verification

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

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

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

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.

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

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.

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.

3.2.2 Tasks of approved bodies

The approved body shall perform the

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

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

The approved certification body involved by the manufacturer shall issue an EC certificate of conformity of the factory production control stating the conformity with the factory production control of this European Technical Approval.

In cases where the provisions of the European Technical Approval and its control plan are no longer fulfilled the certification body shall withdraw the certificate of conformity and inform Deutsches Institut für Bautechnik without delay.

3.3 CE marking

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

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

$$n_1 \geq 4; \quad n_2 \geq 1 \quad \text{and} \quad n_3 \leq 4,5 \text{ kN} \quad \text{or}$$

$$n_1 \geq 3; \quad n_2 \geq 1 \quad \text{and} \quad n_3 \leq 3,0 \text{ kN.}$$

- 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 5, Table 3.)

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

4.2.2 Resistance in concrete (use category "a")

The characteristic values of resistance of the anchor for use in concrete are given in Annex 6, Table 4 and Annex 8, Table 6. The design method is valid for cracked and non-cracked concrete.

4.2.3 Resistance in solid masonry (use category "b") for W-UR 14 SymCon

The characteristic values of resistance of the anchor for use in solid masonry are given in Annex 6, Table 4 and Annex 10, 11, 20, 23, 24 and 25. These values are independent of the load direction (tension, shear or combined tension and shear) and the mode of failure.

The characteristic resistances given in Annex 10, 11, 20, 23, 24 and 25 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") for W-UR 14 SymCon

The characteristic resistances for use in hollow or perforated masonry given in Annex 6, Table 4 and Annex 12 to 19, 21, 22 and 26 are only valid for the bricks and blocks according to these 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 to Annex 5, Table 3.

The influence of larger embedment depths [compare Annex 5, Table 3, footnote 2)] and/or different bricks and blocks (according to Annex 12 to 19, 21, 22 and 26 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 Specific conditions for the design method in solid masonry and hollow or perforated masonry for W-UR 14 SymCon

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

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

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

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

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

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

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

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.

4.2.6 Characteristic values, spacing and dimensions of anchorage member

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

4.2.7 Displacement behaviour

The displacements under tension and shear loading in concrete and masonry are given in Annex 9, Table 7.

4.3 Installation of anchor

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

- Anchor installation carried out by appropriately qualified personnel under the supervision of the person responsible for technical matters on site.
- Use of the anchor only as supplied by the manufacturer without exchanging any component of the anchor.
- Anchor installation in accordance with the manufacturer's specifications and drawings using the tools indicated in this European Technical Approval:
- Checks before placing the anchor, to ensure that the characteristic values of the base material in which the anchor is to be placed, is identical with the values, which the characteristic loads apply for.
- Observation of the drill method according Annex 12 to 19, 21, 22 and 26 (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: $\geq -40\text{ °C}$
 - 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 10 to 26 for the same base material as it is present on the construction works.

Furthermore job site tests for use in (different) solid masonry are possible only if the plastic anchor has already characteristic values given in Annex 10, 11, 20, 23, 24 and 25 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 12 to 19, 21, 22 and 26 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 12 to 19, 21, 22 and 26.

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

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

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

4.4.2 Assembly

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

Depending on the drilling tool hard metal hammer drill bits or hard metal percussion drill bits, respectively, according to ISO 5468 should be used. New drill bits should be used for one test series or drill bits with $d_{\text{cut,m}} = 6,2 \text{ mm} < d_{\text{cut}} \leq 6,4 \text{ mm} = d_{\text{cut,max}}$ (W-UR 6 SymCon) or $d_{\text{cut,m}} = 14,25 \text{ mm} < d_{\text{cut}} \leq 14,5 \text{ mm} = d_{\text{cut,max}}$ (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
- Date and place of tests
- Test rig
- Type of structure to be fixed
- Masonry (type of brick, strength class, all dimensions of bricks, mortar group if possible); visual assessment of masonry (flush joints, joint clearance, regularity)
- Plastic anchor and special screw
- value of the cutting diameter of hard metal hammer-drill bits, measured before and after drilling if no new drill bits are used
- Results of tests including the indication of value N_1 ; mode of failure
- Tests carried out or supervised by ...; signature

4.4.5 Evaluation of test results

The characteristic resistance F_{Rk1} is derived from the measured values N_1 as follows

$$F_{Rk1} = 0,5 \cdot N_1$$

The characteristic resistance F_{Rk1} has to be equal or smaller than the characteristic resistance F_{Rk} which is given in the ETA for similar masonry (bricks or blocks)

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

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

5 Indications to the manufacturer

5.1 Responsibility of the manufacturer

It is in the responsibility of the manufacturer to ensure that the information on the specific conditions according to 1 and 2 including Annexes referred to 4 is given to those who are concerned. This information may be made by reproduction of the respective parts of the European Technical Approval. In addition, all installation data shall be shown clearly on the packaging and/or on an enclosed instruction sheet, preferably using illustrations.

The minimum data required are:

- base material for the intended use,
- ambient temperature of the base material during installation of the anchor,
- drill bit diameter (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

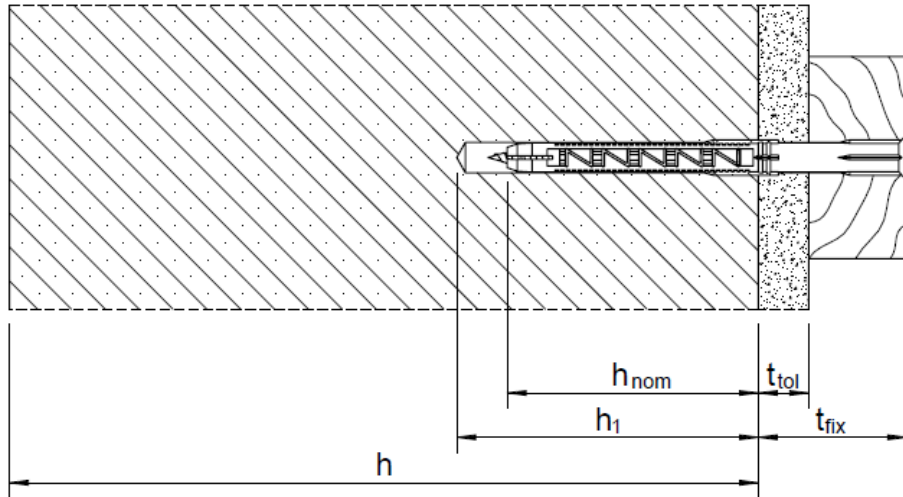
The anchor shall only be packaged and supplied as a complete unit.

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:
Scheller

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

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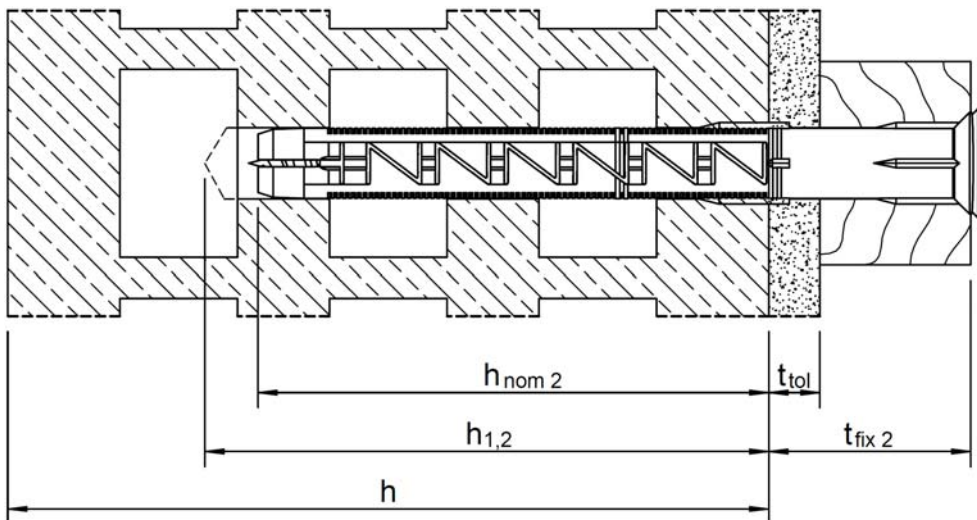
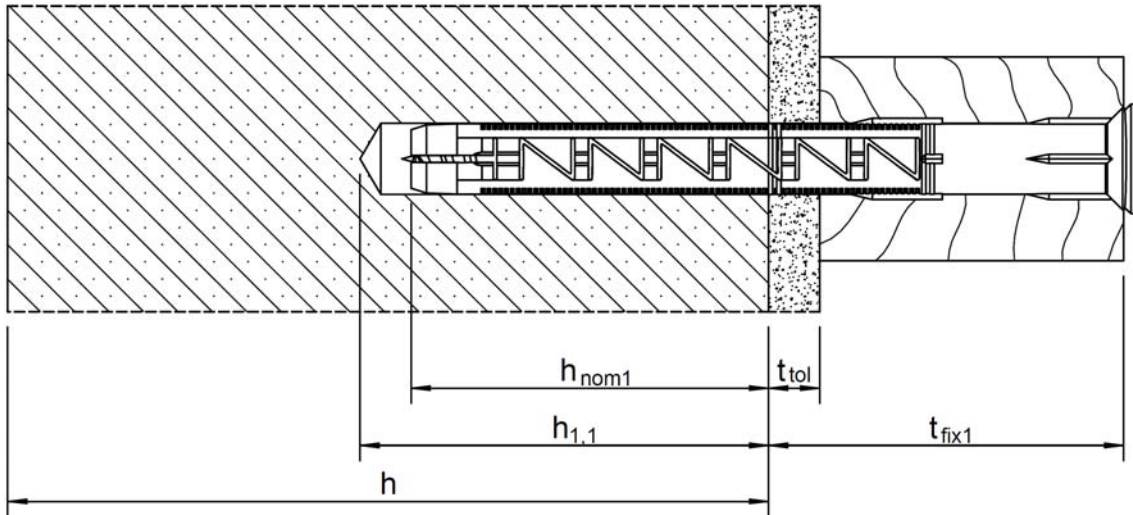
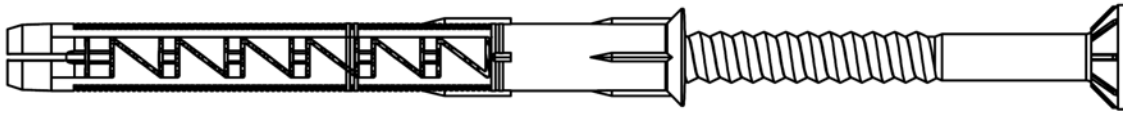
Intended use: W-UR 6 SymCon

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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

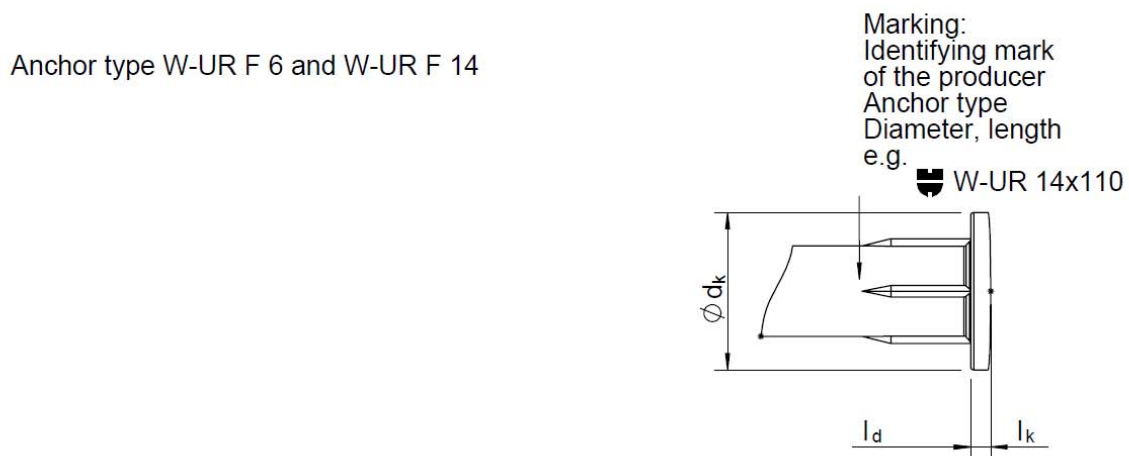
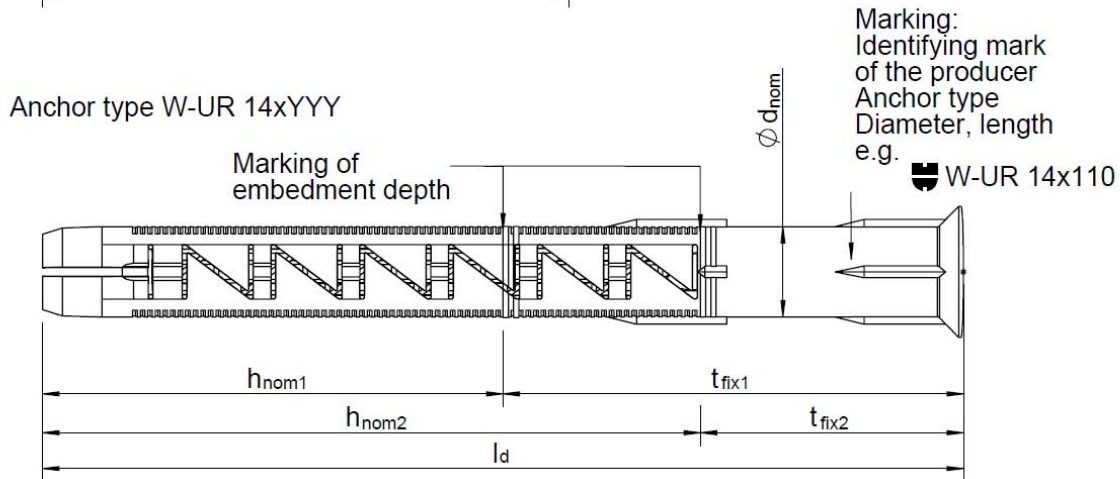
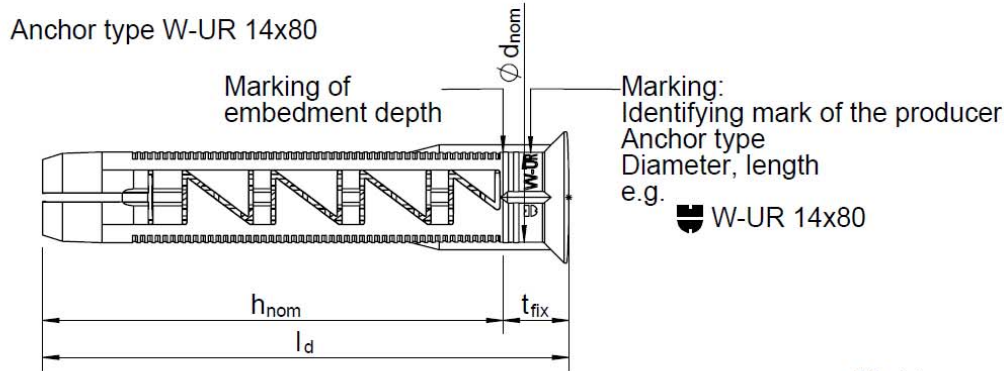
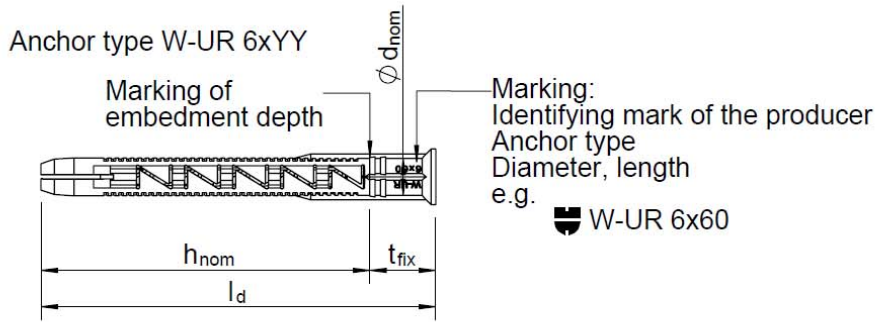
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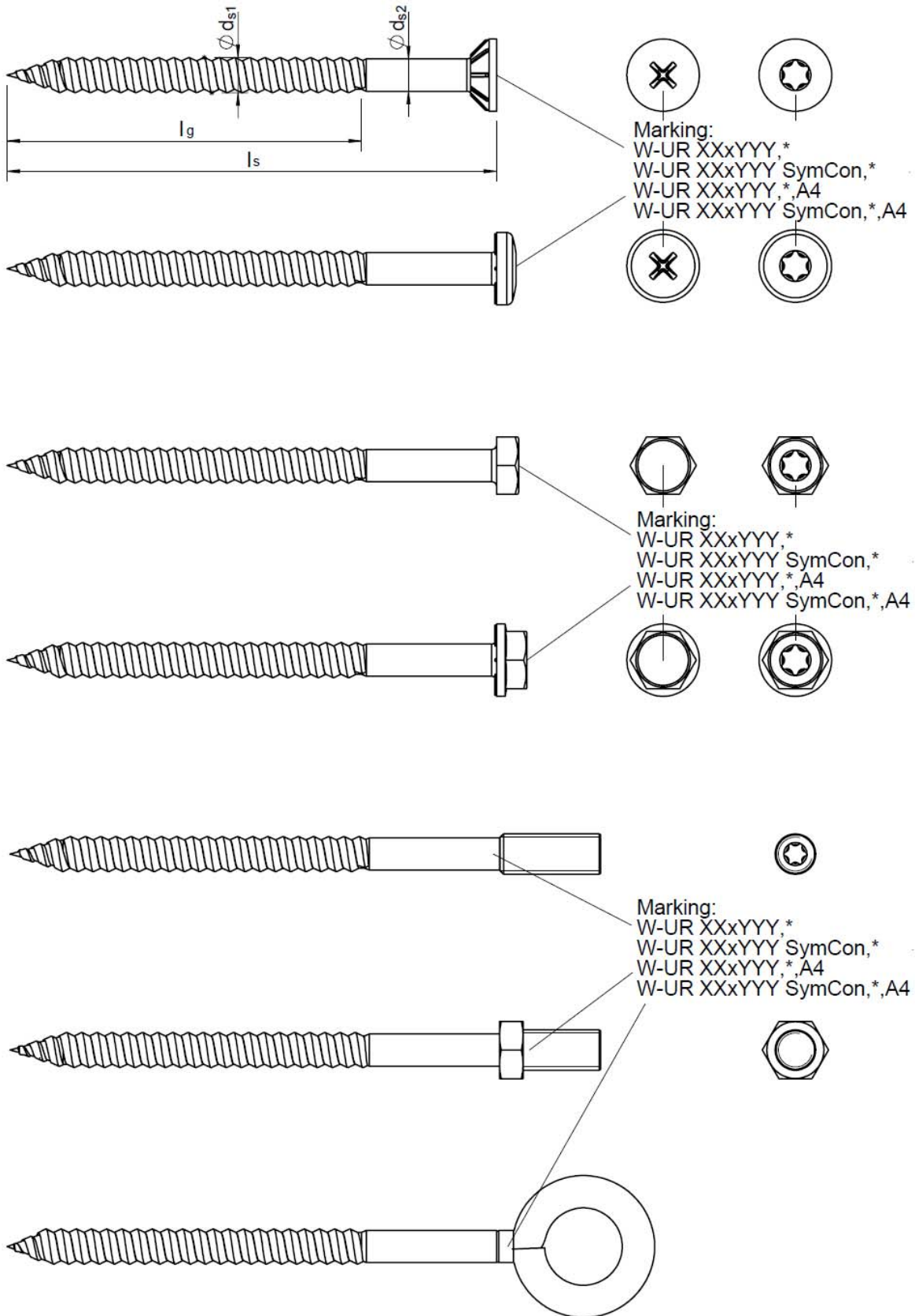
Würth Plastic Anchor W-UR SymCon

Product
Head versions

Annex 3
of European
Technical Approval

ETA-11/0309

Special screw



Würth Plastic Anchor W-UR SymCon

Product
Head versions

Annex 4
of European
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Table 1: Anchor dimensions

Anchor type		W-UR 6 SymCon 6 x l _d	W-UR 14 SymCon	
			14 x 80	14 x l _d
Overall plastic anchor embedment depth ^{1),2)}	h _{nom} ≥ [mm]	50	70	70 (h _{nom1}) or 100 (h _{nom2})
Plastic sleeve				
Plastic sleeve diameter	∅ d _{nom} = [mm]	6	14	
Length of plastic sleeve	l _d [mm]	≥ 50	= 80	≥ 110
Flat collar diameter	∅ d _k = [mm]	12.5	24	
Thickness of flat collar	l _k ≥ [mm]	1.2	3	
Thickness of fixture	t _{fix} ≥ [mm]	0	0	
Special screw				
Screw diameter	d _{s1} = [mm]	5	10.5	
Screw diameter	d _{s2} = [mm]	4.55	9.6	9.6 (head-form loop: 9.6 or 12.0)
Length of screw	l _s = [mm]	l _d + 5 mm	l _d + 5 mm	
Length of thread	l _g = [mm]	55	75	105

Table 2: Materials

Designation	Material
Plastic sleeve	Polyamide, colour brown
Special screw	Carbon steel, strength class 6.8 (f _{uk} ≥ 600 N/mm ² ; f _{yk} ≥ 480 N/mm ²), according to DIN EN ISO 4042, galvanised Stainless steel, strength class ≥ A4-70 (f _{uk} ≥ 700 N/mm ² ; f _{yk} ≥ 450 N/mm ²), 1.4401, 1.4571 or 1.4578
Special screw – head-form loop d _{s2} = 9.6 mm	Carbon steel, strength class 6.8 (f _{uk} ≥ 600 N/mm ² ; f _{yk} ≥ 480 N/mm ²), according to DIN EN ISO 4042, galvanised
Special screw – head-form loop d _{s2} = 12 mm	Carbon steel, strength class 4.8 (f _{uk} ≥ 400 N/mm ² ; f _{yk} ≥ 320 N/mm ²), according to DIN EN ISO 4042, galvanised

Table 3: Installation parameters

Anchor type		W-UR 6 SymCon 6 x l _d	W-UR 14 SymCon	
			14 x 80	14 x l _d
Drill hole diameter	d ₀ = [mm]	6	14	
Overall plastic anchor embedment depth ^{1),2)}	h _{nom} ≥ [mm]	50	70	70 (h _{nom1}) or 100 (h _{nom2})
Cutting diameter of drill bit	d _{cut} ≤ [mm]	6.4	14.45	
Depth of drill hole to deepest point ¹⁾	h ₁ ≥ [mm]	60	80	80 (h _{1,1}) or 110 (h _{1,2})
Diameter of clearance hole in the fixture	d _f ≤ [mm]	6.5	14.5	

¹⁾ See Annex 1 and 2

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 17 and 22).

For anchorages in hollow and perforated masonry with anchor type W-UR 14 SymCon 14 x 80 (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;
Materials;
Installation parameters

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Table 4: Characteristic bending resistance of the special screw in concrete (W-UR 6 SymCon and W-UR 14 SymCon) and masonry (only W-UR 14 SymCon)

		[mm]	Galvanised steel				Stainless steel	
			W-UR 6 SymCon	W-UR 14 SymCon	W-UR 14 SymCon head-form loop		W-UR 6 SymCon A4	W-UR 14 SymCon A4
Screw diameter	d_{s1} / d_{s2}	[mm]	5 / 4.55	10.5 / 9.6	10.5 / 9.6	10.5 / 12	5 / 4.55	10.5 / 9.6
Characteristic bending resistance	$M_{Rk,s}$	[Nm]	4.19	41.9	41.9	27.93	4.89	48.88
Partial safety factor	γ_{Ms} ¹⁾	[mm]	1.25	1.25	1.25	1.25	1.56	1.56

¹⁾ In absence of other national regulations

Table 5.1: Base material: Concrete (W-UR 6 SymCon and W-UR 14 SymCon) and solid masonry (only 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 \geq C12/15					Annex 8
Solid masonry (use category "b")					
Solid brick Mz acc. to DIN 105 EN 771-1 e.g. Wienerberger GmbH	\geq NF	\geq 240x115x71	10 20	\geq 1.8	Annex 10 771-1-020
	\geq 3DF	\geq 240x175x113	28 36		Annex 11 771-1-041
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		\geq 248x175x498	10 20 28	\geq 2.0	Annex 20 771-2-010
Concrete solid block - Vn and Vbn acc. to DIN 18153-100 EN 771-3 Bisotherm GmbH	\geq NF	\geq 240x115x71	10 20 28	\geq 2.0	Annex 23 771-3-004
Lightweight concrete solid block – V and Vbl; e.g. Bisophon acc. to DIN V 18152-100 EN 771-3 Bisotherm GmbH	\geq 3DF	\geq 240x175x113	10 20	\geq 2.0	Annex 24 771-3-017
Lightweight concrete solid brick e.g. Bisobims V and Vbl acc. to DIN V 18152-100 EN 771-3 Bisotherm GmbH	\geq NF	\geq 240x115x71	2 4	\geq 1.0	Annex 25 771-3-007

Würth Plastic Anchor W-UR SymCon

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

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Table 5.2: Base material: Hollow or perforated masonry (only 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 105-1 EN 771-1 e.g. Wienerberger GmbH e.g. Schlagmann Baustoffwerke GmbH & Co. KG	≥ 12DF	≥ 373x240x238	6 8 10	≥ 1.2	Annex 12 771-1-036
Hollow brick HLz T14-24,0 EN 771-1 Z-17.1-651 Wienerberger GmbH	≥ 10DF	≥ 308x240x249	6	≥ 0.7	Annex 13 771-1-048
Hollow brick POROTON-T8-P Hollow brick POROTON-T9-P acc. to T8: EN 771-1; Z-17.1-982 T9: EN 771-1; Z-17.1-674 Wienerberger GmbH Schlagmann Baustoffwerke GmbH & Co. KG	≥ 10DF	≥ 248x300x249	6 8	≥ 0.6	Annex 14 771-1-045
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 15 771-1-032
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 16 771-1-046
Hollow brick ThermoPlan MZ10 EN 771-1 Z-17.1-1015 Mein Ziegelhaus GmbH & Co. KG	≥ 10DF	≥ 248x300x249	8	≥ 0.75	Annex 17 771-1-034
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 18 771-1-024
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 19 771-1-029
Sand-lime perforated brick KS L acc. to DIN 106-1 EN 771-2 e.g. Xella International GmbH	≥ 8DF	≥ 248x240x238	6 8 10 12	≥ 1.4	Annex 21 771-2-013
Sand-lime perforated brick KS L acc. to DIN 106-1 EN 771-2 e.g. Xella International GmbH	≥ 9DF	≥ 373x175x238	6 8 10 12 20	≥ 1.4	Annex 22 771-2-008
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 26 771-3-005

Würth Plastic Anchor W-UR SymCon

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

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Table 6: Characteristic resistance for use in concrete

Anchor type			Galvanised steel						Stainless steel				
			W-UR SymCon						W-UR SymCon				
Failure of expansion element (special screw)			6	14		Head-form Loop 14		6	14				
Overall plastic anchor embedment depth	h_{nom}	[mm]	50	70	100	70		100		50	70	100	
Screw diameter	d_{s1}/d_{s2}	[mm]	5 / 4.55	10.5 / 9.6		10.5 / 9.6	10.5 / 12.0	10.5 / 9.6	10.5 / 12.0	5 / 4.55	10.5 / 9.6		
Characteristic tension resistance	$N_{Rk,s}$	[kN]	7.17	33.25		33.25	22.17	33.25	22.17	8.36	38.79		
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1.5	1.5		1.5		1.5		1.87	1.87		
Characteristic shear resistance	$V_{Rk,s}$	[kN]	3.58	16.63		16.63	11.08	16.63	11.08	4.18	19.4		
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1.25	1.25		1.25		1.25		1.56	1.56		
Pull-out failure (plastic sleeve)													
Concrete \geq C16/20													
Characteristic resistance	$30^{\circ}C^{2)} / 50^{\circ}C^{3)}$	$N_{Rk,p}$	[kN]	2.0	8.5	8.5	8.5		8.5		2.0	8.5	8.5
	$50^{\circ}C^{2)} / 80^{\circ}C^{3)}$	$N_{Rk,p}$	[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	1.8		
Concrete C12/15													
Characteristic resistance	$30^{\circ}C^{2)} / 50^{\circ}C^{3)}$	$N_{Rk,p}$	[kN]	2.0	6.0	6.0	6.0		6.0		2.0	6.0	6.0
	$50^{\circ}C^{2)} / 80^{\circ}C^{3)}$	$N_{Rk,p}$	[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	1.8		
Concrete cone failure and concrete edge failure for single anchor and anchor group													
Tension load⁴⁾													
$N_{Rk,c} = 7.2 \cdot \sqrt{f_{ck,cube}} \cdot h_{ef}^{1.5} \cdot \frac{C}{C_{cr,N}} = N_{Rk,p} \cdot \frac{C}{C_{cr,N}}$			with: $h_{ef}^{1.5} = \frac{N_{Rk,p}}{7.2 \cdot \sqrt{f_{ck,cube}}}$ $\frac{C}{C_{cr,N}} \leq 1$										
Shear load⁴⁾													
$V_{Rk,c} = 0.45 \cdot \sqrt{d_{nom}} \cdot (h_{nom} / d_{nom})^{0.2} \cdot \sqrt{f_{ck,cube}} \cdot c_1^{1.5} \cdot \left(\frac{c_2}{1.5c_1}\right)^{0.5} \cdot \left(\frac{h}{1.5c_1}\right)^{0.5}$			with: $\left(\frac{c_2}{1.5 \cdot c_1}\right)^{0.5} \leq 1$ $\left(\frac{h}{1.5 \cdot c_1}\right)^{0.5} \leq 1$										
c_1	edge distance closest to the edge in loading direction												
c_2	edge distance perpendicular to direction 1												
$f_{ck,cube}$	nominal characteristic concrete compression strength (based on cubes), values for C50/60 at maximum												
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	1.8										

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

Würth Plastic Anchor W-UR SymCon

Characteristic resistance for use in concrete

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Table 7: Displacements¹⁾ under tension and shear loading in concrete and masonry

Anchor type	Tension load				Shear load		
	h_{nom} [mm]	$F_{Rk}^{2)}$ [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 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 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. 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.

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. 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.

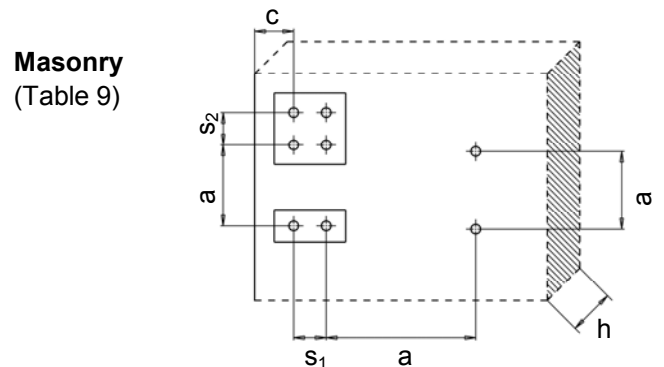
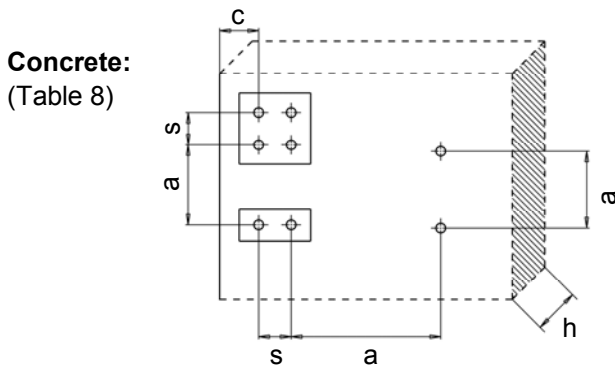
	h_{nom} [mm]	h_{min} [mm]	$c_{cr,N}$ [mm]	c_{min} [mm]	s_{min} [mm]
W-UR 6 SymCon	Concrete \geq C16/20	≥ 50	90	40	40
	Concrete C12/15	≥ 50	90	60	60
W-UR 14 SymCon	Concrete \geq C16/20	≥ 70	110	80	60
	Concrete C12/15	≥ 70	110	110	85
	Concrete \geq C16/20	≥ 100	140	100	80
	Concrete C12/15	≥ 100	140	140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

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

			W-UR 14 SymCon
Minimum thickness of member	h_{min}	[mm]	100 ¹⁾
Single anchor			
Minimum allowable spacing	a_{min}	[mm]	250
Minimum allowable edge distance	c_{min}	[mm]	100 (240) ²⁾
Anchor group			
Spacing perpendicular to free edge	$s_{1,min}$	[mm]	200 (400) ²⁾
Spacing parallel to free edge	$s_{2,min}$	[mm]	400 (960) ²⁾
Minimum allowable edge distance	c_{min}	[mm]	100 (240) ²⁾

1) depends on the brick size (see the following annexes 11 to 26)

2) depends on brick (see the following annexes 11 to 26) – the values in brackets govern for masonry units with a height < 100 mm



Würth Plastic Anchor W-UR SymCon

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

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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 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
Drill method		[-]	Hammer drilling
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	14.5
Minimum allowable edge distance	$c_{min} \geq$	[mm]	240

Table 10.1.3: 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
Solid brick Mz, $f_b \geq 10 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	1.2
Characteristic resistance F_{Rk}	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	1.2
Solid brick Mz, $f_b \geq 20 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	2.0
Characteristic resistance F_{Rk}	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	1.5
Solid brick Mz, $f_b \geq 28 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	2.5
Characteristic resistance F_{Rk}	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	2.5
Solid brick Mz, $f_b \geq 36 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	3.5
Characteristic resistance F_{Rk}	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	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 4.2.5 of the ETA.

²⁾ In absence of other national regulations

³⁾ Maximum long term temperature

⁴⁾ Maximum short term temperature

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

Brick data, installation parameters,
characteristic resistance

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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 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		[-]	Hammer drilling
Overall plastic anchor embedment depth	$h_{nom} \geq$	[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 10.2.3: Characteristic resistance $F_{Rk}^{1)}$ in [kN] for single anchor

Anchor size		W-UR 14 SymCon	
Overall plastic anchor embedment depth	$h_{nom} \geq$	[mm]	100
Solid brick Mz, $f_b \geq 10 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	4.0
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	3.5
Solid brick Mz, $f_b \geq 20 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	5.5
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	5.5
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	2.5

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

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

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

Würth Plastic Anchor W-UR SymCon**Solid masonry: Solid brick Mz, 3DF**

Brick data, installation parameters,
characteristic resistance

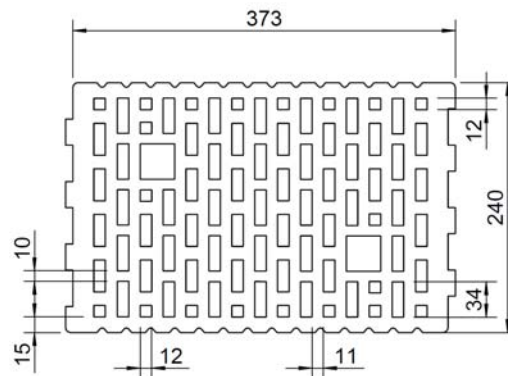
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Base material hollow masonry: Hollow brick HLz, 12DF**Table 10.3.1: Brick data**

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 10.3.2: 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	$c_{\min} \geq$	[mm]	190

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

Anchor size		W-UR 14 SymCon	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	100
Hollow brick HLz, $f_b \geq 6 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	1.5
Characteristic resistance F_{Rk}	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	1.5
Hollow brick HLz, $f_b \geq 8 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	2.0
Characteristic resistance F_{Rk}	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	2.0
Hollow brick HLz, $f_b \geq 10 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	2.5
Characteristic resistance F_{Rk}	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	2.5
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	2.5

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

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

²⁾ In absence of other national regulations

³⁾ Maximum long term temperature

⁴⁾ Maximum short term temperature

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

Brick data, installation parameters,
characteristic resistance

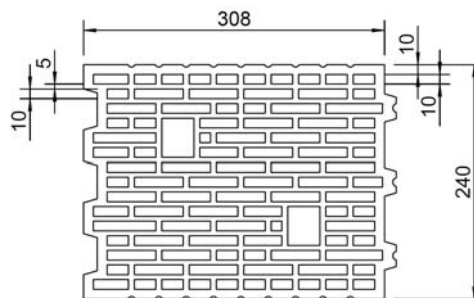
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Base material hollow masonry: Hollow brick HLz, T14-24,0**Table 10.4.1: Brick data**

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 10.4.2: 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	$c_{\min} \geq$	[mm]	100

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

Anchor size		W-UR 14 SymCon	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[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
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.6
Partial safety factor	$\gamma_{Mm}^2)$	[-]	2.5

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

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

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

Würth Plastic Anchor W-UR SymCon**Hollow brick HLz, T14-24,0**

Brick data, installation parameters,
characteristic resistance

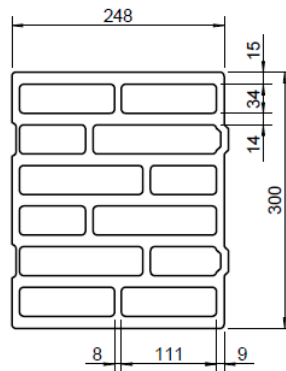
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Base material hollow masonry: Hollow brick POROTON-T8-30,0-P and POROTON-T9-30,0-P**Table 10.5.1: Brick data**

Description of brick		771-1-045	POROTON-T8-30,0-P and POROTON-T9-30,0-P
Type of brick			Hollow brick POROTON-T8-P, -T9-P
Bulk density	$\rho \geq$	[kg/dm ³]	0.6
Standard, approval			T8: EN 771-1; Z-17.1-982 T9: EN 771-1; Z-17.1-674
Producer of brick			Wienerberger GmbH Oldenburger Allee 26, D-30659 Hannover Schlagmann Baustoffwerke GmbH & Co. KG Ziegeleistraße 1, D-84367 Zeilarn
Measurement		[mm]	$\geq 10DF (\geq 248 \times 300 \times 249)$
Minimum thickness of member	$h_{min} =$	[mm]	300

**Table 10.5.2: Installation parameters**

Anchor size		W-UR 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 10.5.3: 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
POROTON-T8-30,0-P and POROTON-T9-30,0-P, $f_b \geq 6 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$	[kN]	1.5
	$50^\circ\text{C}^3 / 80^\circ\text{C}^4$	[kN]	1.5
POROTON-T8-30,0-P and 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
	$50^\circ\text{C}^3 / 80^\circ\text{C}^4$	[kN]	2.0
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 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

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

Brick data, installation parameters,
characteristic resistance

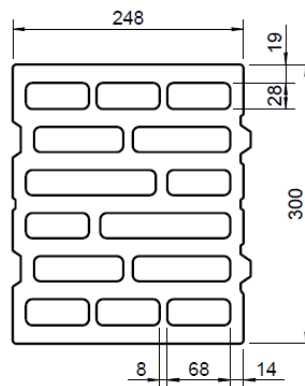
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Base material hollow masonry: Hollow brick POROTON S10**Table 10.6.1: Brick data**

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 10.6.2: 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	$c_{\min} \geq$	[mm]	100

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

Anchor size		W-UR 14 SymCon	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	100
POROTON S10-30, $f_b \geq 8 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	1.5
Characteristic resistance F_{Rk}	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	1.5
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	2.5

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

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

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

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

Brick data, installation parameters,
characteristic resistance

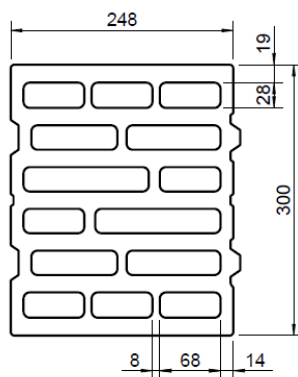
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Base material hollow masonry: Hollow brick POROTON S11**Table 10.7.1: Brick data**

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 10.7.2: 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	$c_{\min} \geq$	[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	$h_{\text{nom}} =$	[mm]	100
POROTON S11-30-P, $f_b \geq 8 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	2.5
Characteristic resistance F_{Rk}	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	2.5
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	2.5

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

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

²⁾ In absence of other national regulations

³⁾ Maximum long term temperature

⁴⁾ Maximum short term temperature

Würth Plastic Anchor W-UR SymCon**Hollow brick: POROTON S11-30,0-P**

Brick data, installation parameters,
characteristic resistance

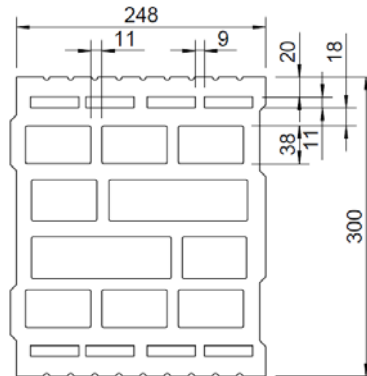
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Base material hollow masonry: Hollow brick ThermoPlan MZ10**Table 10.8.1: Brick data**

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 10.8.2: 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	$h_1 \geq$	[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]	14.5
Minimum allowable edge distance	$c_{\min} \geq$	[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]	≥ 70 ⁵⁾ = 100
Hollow brick ThermoPlan MZ10, $f_b \geq 8 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	2.0 2.5
Characteristic resistance F_{Rk}	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	2.0 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 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

5) The given values F_{Rk} in this column are valid for the embedment depth range $70 \text{ mm} \leq h_{\text{nom}} < 100 \text{ mm}$ (see Annex 5, Table 3). 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

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Base material hollow masonry: Hollow brick ThermoPlan TS²

Table 10.9.1: 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

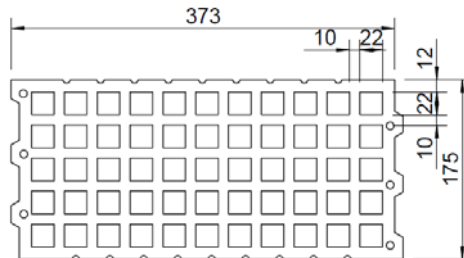


Table 10.9.2: Installation parameters

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

Anchor size		W-UR 14 SymCon		
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	$70 \text{ mm} \leq h_{nom} \leq 100 \text{ mm}$ ⁵⁾	
Hollow brick ThermoPlan TS ² , $f_b \geq 6 \text{ N/mm}^2$	Characteristic resistance F_{Rk}	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	0.4
		$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.4
Hollow brick ThermoPlan TS ² , $f_b \geq 8 \text{ N/mm}^2$	Characteristic resistance F_{Rk}	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	0.6
		$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.6
Hollow brick ThermoPlan TS ² , $f_b \geq 10 \text{ N/mm}^2$	Characteristic resistance F_{Rk}	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	0.75
		$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.75
Hollow brick ThermoPlan TS ² , $f_b \geq 12 \text{ N/mm}^2$	Characteristic resistance F_{Rk}	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	0.9
		$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.9
Hollow brick ThermoPlan TS ² , $f_b \geq 20 \text{ N/mm}^2$	Characteristic resistance F_{Rk}	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	1.5
		$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	1.5
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 4.2.5 of the ETA.
- 2) In absence of other national regulations
- 3) Maximum long term temperature
- 4) Maximum short term temperature
- 5) The influence of $h_{nom} > 100 \text{ mm}$ 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

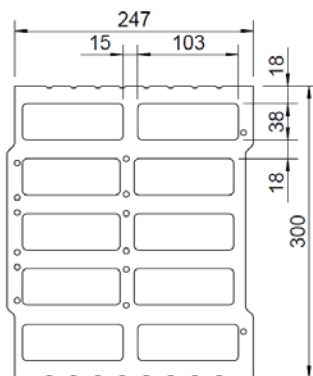
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Base material hollow masonry: Hollow brick THERMOPOR TV 9-Plan**Table 10.10.1: Brick data**

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 10.10.2: 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 10.10.3: Characteristic resistance F_{Rk} ¹⁾ in [kN] for single anchor

Anchor size		W-UR 14 SymCon	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[mm]	100
Hollow brick THERMOPOR TV 9-Plan, $f_b \geq 4 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.9
Characteristic resistance F_{Rk}	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.9
Hollow brick THERMOPOR TV 9-Plan, $f_b \geq 6 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	1.5
Characteristic resistance F_{Rk}	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	1.5
Hollow brick THERMOPOR TV 9-Plan, $f_b \geq 8 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[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 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

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

Brick data, installation parameters,
characteristic resistance

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Base material solid masonry, sand-lime solid brick Silka XL Basic, Silka XL Plus**Table 10.11.1: 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 10.11.2: 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]	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]	14.5		
Minimum allowable edge distance	$c_{\min} \geq$	[mm]	100	100	60

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	= 100	
Minimum allowable edge distance	$c_{\min} \geq$	[mm]	100	100	60
Sand-lime solid brick Silka XL Basic, Silka XL Plus, $f_b \geq 10 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$	[kN]	3.0	3.0	2.5
	$50^\circ\text{C}^3 / 80^\circ\text{C}^4$	[kN]	3.0	3.0	2.5
Sand-lime solid brick Silka XL Basic, Silka XL Plus, $f_b \geq 20 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$	[kN]	4.5	4.5	3.5
	$50^\circ\text{C}^3 / 80^\circ\text{C}^4$	[kN]	4.5	4.5	3.5
Sand-lime solid brick Silka XL Basic, Silka XL Plus, $f_b \geq 28 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$	[kN]	6.0	6.5	5.0
	$50^\circ\text{C}^3 / 80^\circ\text{C}^4$	[kN]	6.0	6.5	5.0
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 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

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

Brick data, installation parameters,
characteristic resistance

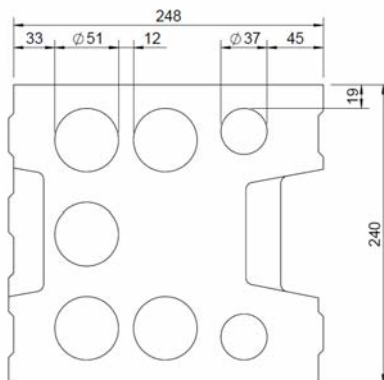
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Base material hollow masonry, sand-lime perforated brick KS L, 8DF**Table 10.12.1: Brick data**

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 10.12.2: 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	$c_{\min} \geq$ [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	$h_{\text{nom}} =$ [mm]	100
Sand-lime perforated brick KS L, $f_b \geq 6 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$ [kN]	1.2
Characteristic resistance F_{Rk}	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$ [kN]	1.2
Sand-lime perforated brick KS L, $f_b \geq 8 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$ [kN]	1.5
Characteristic resistance F_{Rk}	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$ [kN]	1.5
Sand-lime perforated brick KS L, $f_b \geq 10 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$ [kN]	2.0
Characteristic resistance F_{Rk}	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$ [kN]	2.0
Sand-lime perforated brick KS L, $f_b \geq 12 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$ [kN]	2.5
Characteristic resistance F_{Rk}	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$ [kN]	2.5
Partial safety factor	$\gamma_{Mm}^{2)}$ [-]	2.5

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

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

²⁾ In absence of other national regulations

³⁾ Maximum long term temperature

⁴⁾ Maximum short term temperature

Würth Plastic Anchor W-UR SymCon**Sand-lime perforated brick KS L, 8DF**

Brick data, installation parameters,
characteristic resistance

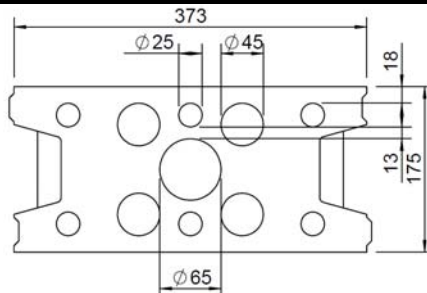
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Base material hollow masonry, sand-lime perforated brick KS L, 9DF**Table 10.13.1: Brick data**

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 10.13.2: 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]	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]	14.5
Minimum allowable edge distance	$c_{\min} \geq$	[mm]	100

Table 10.13.3: 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, $f_b \geq 6 \text{ N/mm}^2$	$30^\circ\text{C}^{3)}$ / $50^\circ\text{C}^{4)}$	[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, $f_b \geq 8 \text{ N/mm}^2$	$30^\circ\text{C}^{3)}$ / $50^\circ\text{C}^{4)}$	[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, $f_b \geq 10 \text{ N/mm}^2$	$30^\circ\text{C}^{3)}$ / $50^\circ\text{C}^{4)}$	[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, $f_b \geq 12 \text{ N/mm}^2$	$30^\circ\text{C}^{3)}$ / $50^\circ\text{C}^{4)}$	[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, $f_b \geq 20 \text{ N/mm}^2$	$30^\circ\text{C}^{3)}$ / $50^\circ\text{C}^{4)}$	[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 4.2.5 of the ETA.

²⁾ In absence of other national regulations

³⁾ Maximum long term temperature

⁴⁾ Maximum short term temperature

⁵⁾ The given values F_{Rk} in this column are valid for the embedment depth range $70 \text{ mm} \leq h_{\text{nom}} < 100 \text{ mm}$ (see Annex 5, Table 3). 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

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Base material solid masonry, Concrete solid block Vn and Vbn, NF**Table 10.14.1: Brick data**

Description of brick		771-3-004 (o)	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 10.14.2: 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
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]	14.5
Minimum allowable edge distance	$c_{min} \geq$	[mm]	240

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	$h_{nom} \geq$	[mm]	70
Concrete solid block Vn and Vbn, $f_b \geq 10 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$	[kN]	2.0
	Characteristic resistance F_{Rk}	$50^\circ\text{C}^3 / 80^\circ\text{C}^4$	[kN]
Concrete solid block Vn and Vbn, $f_b \geq 20 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$	[kN]	3.0
	Characteristic resistance F_{Rk}	$50^\circ\text{C}^3 / 80^\circ\text{C}^4$	[kN]
Concrete solid block Vn and Vbn, $f_b \geq 28 \text{ N/mm}^2$	$30^\circ\text{C}^3 / 50^\circ\text{C}^4$	[kN]	4.5
	Characteristic resistance F_{Rk}	$50^\circ\text{C}^3 / 80^\circ\text{C}^4$	[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 4.2.5 of the ETA.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

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

Brick data, installation parameters,
characteristic resistance

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Base material solid masonry, Lightweight concrete solid block V and Vbl, 3DF**Table 10.15.1: 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 Mühlheim-Kärlich
Format (measurement)		[mm]	\geq 3DF (\geq 240x175x113)
Minimum thickness of member	$h_{\min} =$	[mm]	175

Table 10.15.2: 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	$c_{\min} \geq$	[mm]	100

Table 10.15.3: 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 block V and Vbl, $f_b \geq 10 \text{ N/mm}^2$ Characteristic resistance F_{Rk}	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	4.0
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	4.0
Lightweight concrete solid block V and Vbl, $f_b \geq 20 \text{ N/mm}^2$ Characteristic resistance F_{Rk}	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	5.5
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	5.5
Partial safety factor	$\gamma_{Mm}^2)$	[-]	2.5

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

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

²⁾ In absence of other national regulations

³⁾ Maximum long term temperature

⁴⁾ Maximum short term temperature

Würth Plastic Anchor W-UR SymCon**Lightweight concrete solid block V and Vbl, 3DF**

Brick data, installation parameters,
characteristic resistance

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Base material solid masonry, Lightweight concrete solid brick V and Vbl, NF**Table 10.16.1: 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. BasisBims, Bisotherm GmbH Eisenbahnstraße 12 D-56218 Mühlheim-Kärlich
Format (measurement)		[mm]	\geq NF (\geq 240x115x71)
Minimum thickness of member	$h_{\min} =$	[mm]	115

Table 10.16.2: 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	$c_{\min} \geq$	[mm]	240

Table 10.16.3: 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, $f_b \geq 2 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	1.2
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	1.2
Lightweight concrete solid brick V 4 and Vbl 4, $f_b \geq 4 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	2.5
	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	2.0
Characteristic resistance F_{Rk}			
Partial safety factor	$\gamma_{Mm}^2)$	[-]	2.5

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

Würth Plastic Anchor W-UR SymCon

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

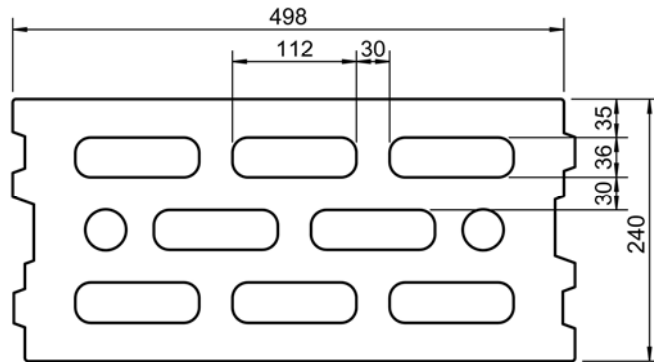
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Base material hollow brick lightweight concrete 3K Hbl**Table 10.17.1: Brick data**

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 10.17.2: 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]	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 10.17.3: Characteristic resistance F_{Rk} ¹⁾ in [kN] for single anchor

Anchor size		W-UR 14 SymCon	
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	100
Hollow brick lightweight concrete 3K Hbl, $f_b \geq 2 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	0.6
Characteristic resistance F_{Rk}	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.5
Hollow brick lightweight concrete 3K Hbl, $f_b \geq 4 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	1.2
Characteristic resistance F_{Rk}	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	0.9
Hollow brick lightweight concrete 3K Hbl, $f_b \geq 6 \text{ N/mm}^2$	$30^\circ\text{C}^3) / 50^\circ\text{C}^4)$	[kN]	1.5
Characteristic resistance F_{Rk}	$50^\circ\text{C}^3) / 80^\circ\text{C}^4)$	[kN]	1.5
Partial safety factor	$\gamma_{Mm}^2)$	[-]	2.5

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

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

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

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

Brick data, installation parameters,
characteristic resistance

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