

Approval body for construction products  
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and  
Laender Governments



## European Technical Assessment

**ETA-11/0309**  
**of 13 April 2018**

English translation prepared by DIBt - Original version in German language

### General Part

Technical Assessment Body issuing the  
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

Würth Plastic Anchor W-UR SymCon

Product family  
to which the construction product belongs

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

Manufacturer

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

Manufacturing plant

Herstellwerk 2

This European Technical Assessment  
contains

50 pages including 3 annexes which form an integral part  
of this assessment

This European Technical Assessment is  
issued in accordance with Regulation (EU)  
No 305/2011, on the basis of

ETAG 020, edition March 2012,  
used as EAD according to Article 66 Paragraph 3 of  
Regulation (EU) No 305/2011.

**European Technical Assessment**

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## Specific Part

### 1 Technical description of the 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 product description is given in Annex A.

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

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

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the anchors of at least 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.

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

#### 3.1 Mechanical resistance and stability (BWR 1)

The essential characteristics regarding mechanical resistance and stability are included under the Basic Works Requirement Safety in use.

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

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	See Annex C 3

#### 3.3 Safety and accessibility (BWR 4)

Essential characteristic	Performance
Characteristic resistance for tension and shear loads	See Annexes C 1, C 2, C 8 – C 33
Characteristic resistance for bending moments	See Annex C 1, C 2
Displacements under shear and tension loads	See Annex C 3
Anchor distances and dimensions of members	See Annex B 3, B 4

#### 3.4 General aspects

The verification of durability is part of testing the essential characteristics. Durability is only ensured if the specifications of intended use according to Annex B are taken into account.

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

In accordance with guideline for European technical approval ETAG 020, March 2012 used as European Assessment Document (EAD) according to Article 66 Paragraph 3 of Regulation (EU) No 305/2011 the applicable European legal act is: 97/463/EC.

The system to be applied is: 2+

**5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document**

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Deutsches Institut für Bautechnik.

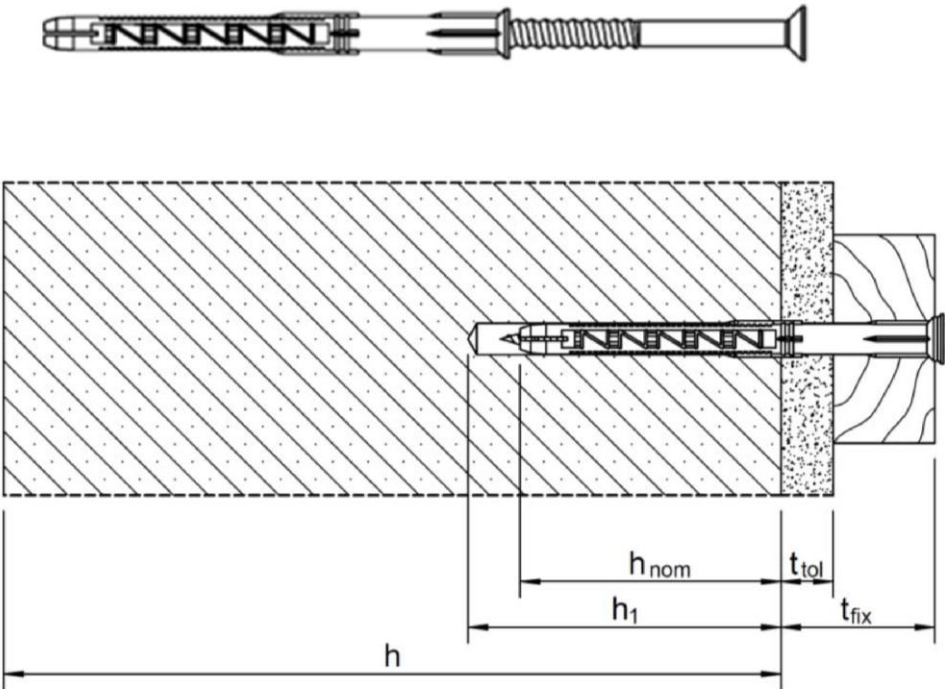
Issued in Berlin on 13 April 2018 by Deutsches Institut für Bautechnik

BD Dipl.-Ing. Andreas Kummerow  
Head of Department

*beglaubigt:*  
Ziegler



Plastic Anchor W-UR 6 SymCon



Legend:

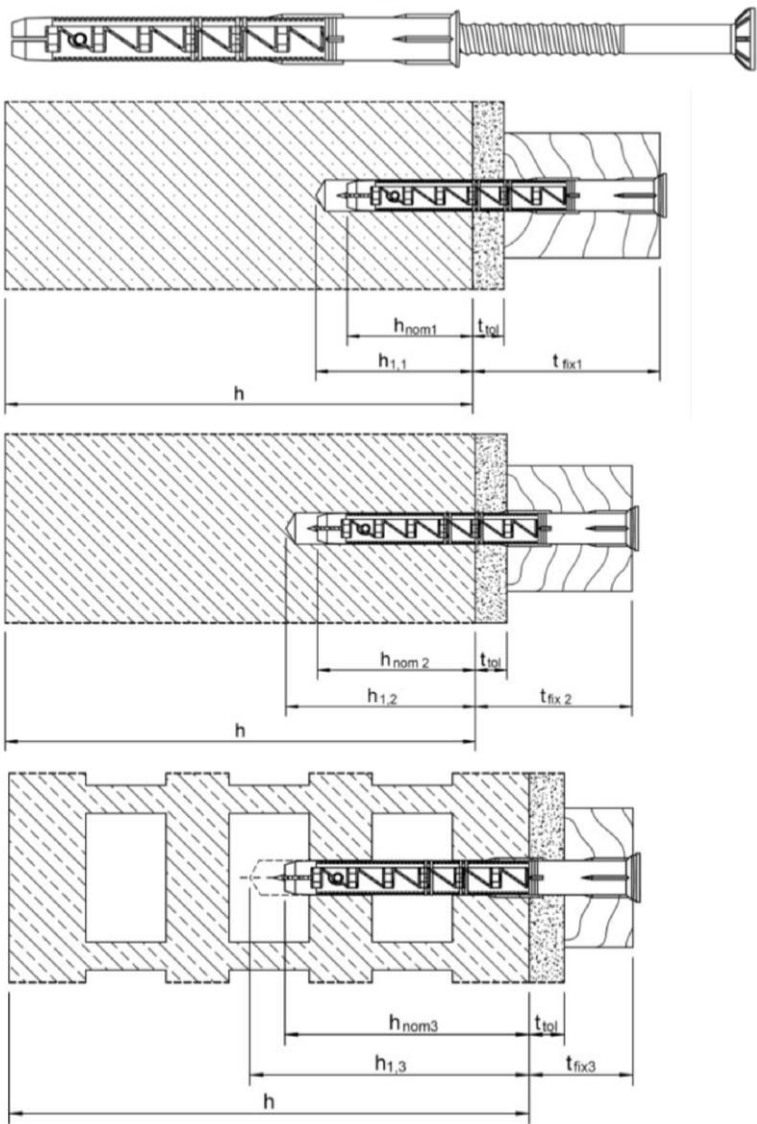
- $h_{nom}$ : Overall plastic anchor embedment depth in the base material
- $h_1$ : Depth of drill hole to deepest point
- $h$ : Thickness of member
- $t_{fix}$ : Thickness of fixture
- $t_{tol}$ : Thickness of non-load-bearing layer

Würth Plastic Anchor W-UR SymCon

Product description  
Product and installed condition W-UR 6 SymCon

Annex A 1

Plastic Anchor W-UR 10 SymCon



Legend:

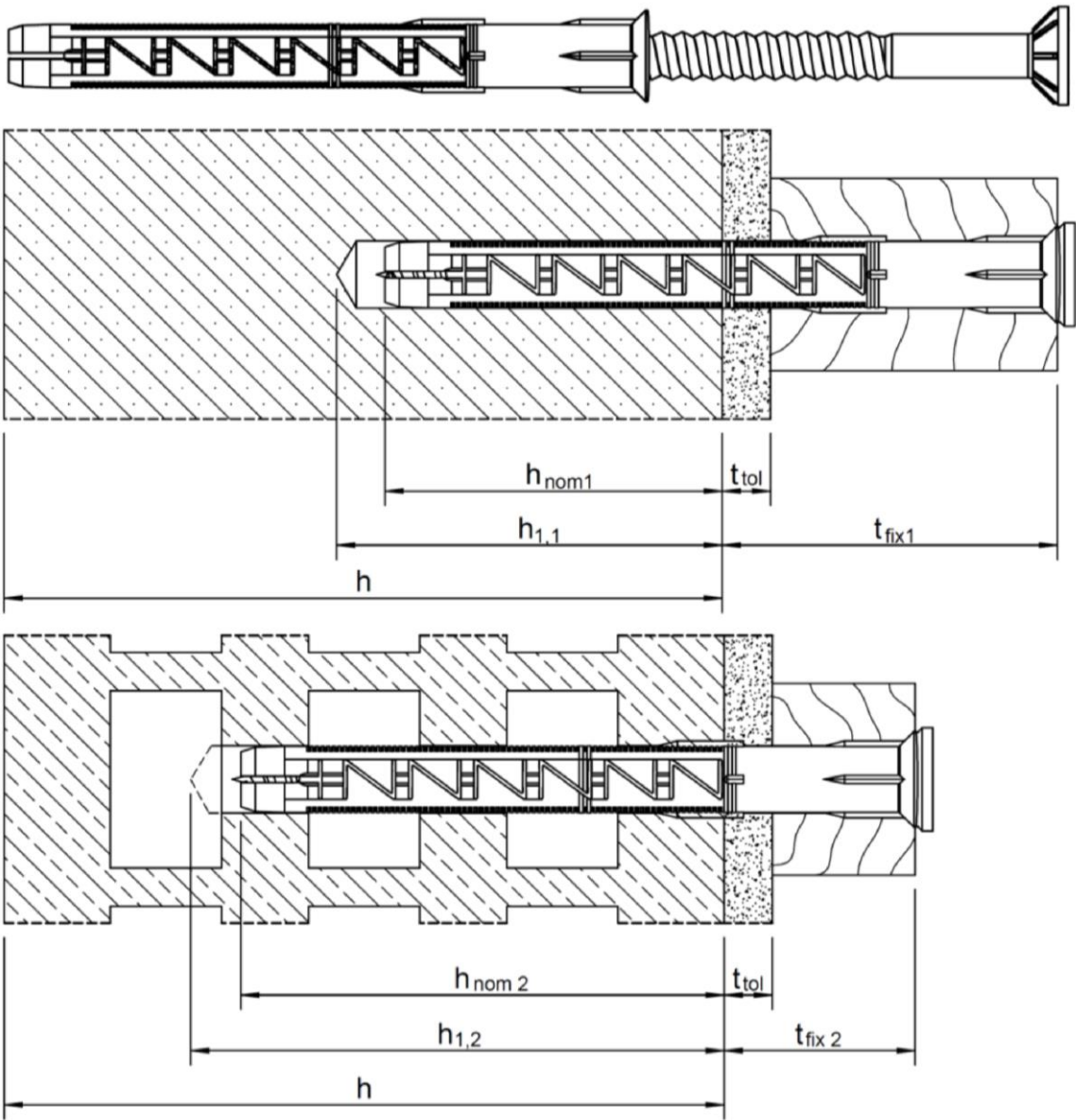
- $h_{nom1}$ : Overall plastic anchor embedment depth 1 in the base material
- $h_{nom2}$ : Overall plastic anchor embedment depth 2 in the base material
- $h_{nom3}$ : Overall plastic anchor embedment depth 3 in the base material
- $h_{1,1}$ : Depth of drill hole to deepest point (1)
- $h_{1,2}$ : Depth of drill hole to deepest point (2)
- $h_{1,3}$ : Depth of drill hole to deepest point (3)
- $h$ : Thickness of member
- $t_{fix1}$ : Thickness of fixture (1)
- $t_{fix2}$ : Thickness of fixture (2)
- $t_{fix3}$ : Thickness of fixture (3)
- $t_{toi}$ : Thickness of non-load-bearing layer

Würth Plastic Anchor W-UR SymCon

Product description  
Product and installed condition W-UR 10 SymCon

Annex A 2

Plastic Anchor W-UR 14 SymCon



Legend:

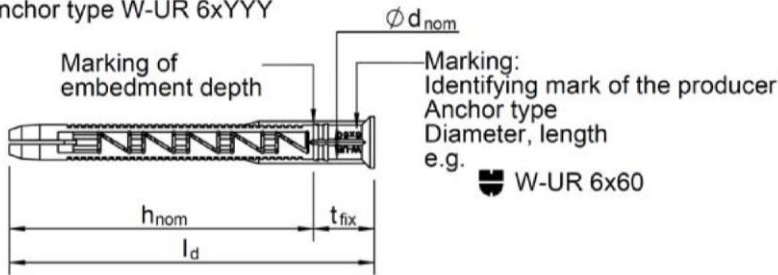
- $h_{nom1}$ : Overall plastic anchor embedment depth 1 in the base material
- $h_{nom2}$ : Overall plastic anchor embedment depth 2 in the base material
- $h_{1,1}$ : Depth of drill hole to deepest point (1)
- $h_{1,2}$ : Depth of drill hole to deepest point (2)
- $h$ : Thickness of member
- $t_{fix1}$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

Würth Plastic Anchor W-UR SymCon
Product description Product and installed condition W-UR 14 SymCon

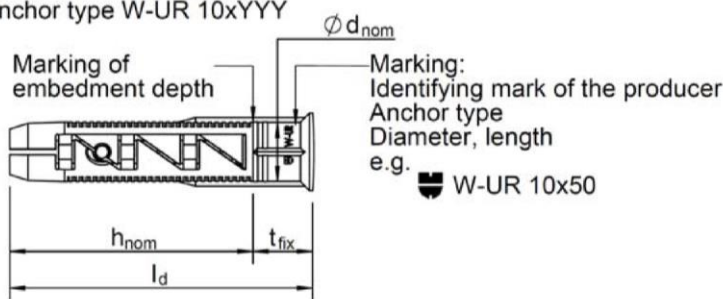
Annex A 3

Plastic Anchor

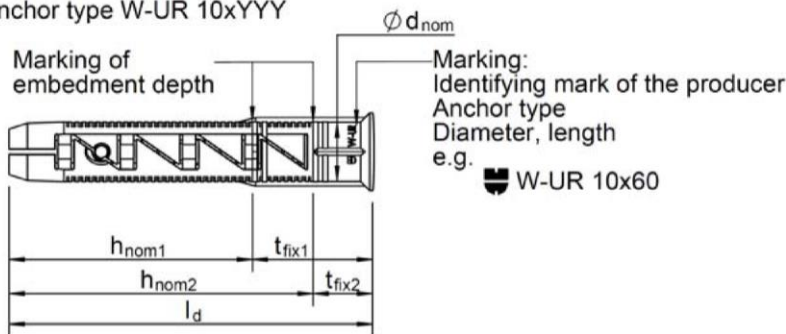
Anchor type W-UR 6xYYY



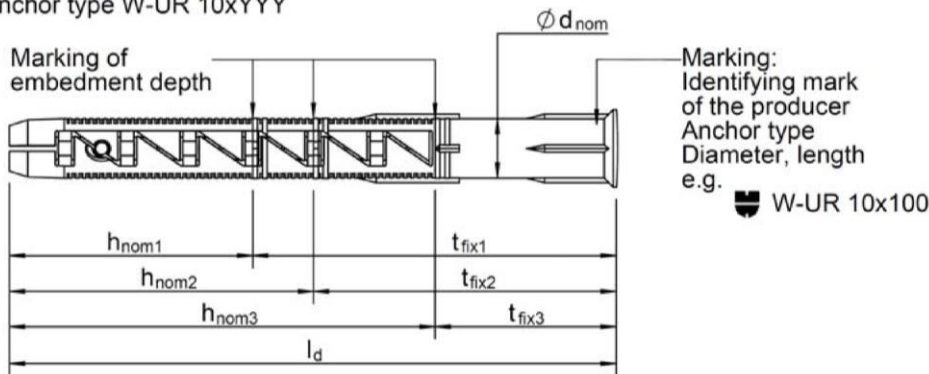
Anchor type W-UR 10xYYY



Anchor type W-UR 10xYYY



Anchor type W-UR 10xYYY



Würth Plastic Anchor W-UR SymCon

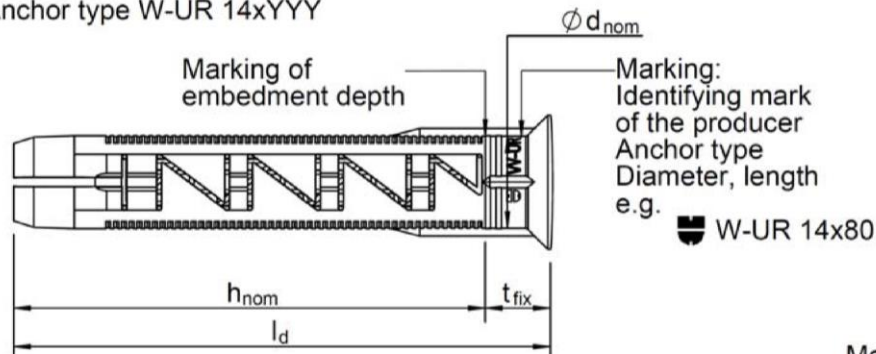
Product description

Anchor types W-UR 6 SymCon and W-UR 10 SymCon – marking and dimensions

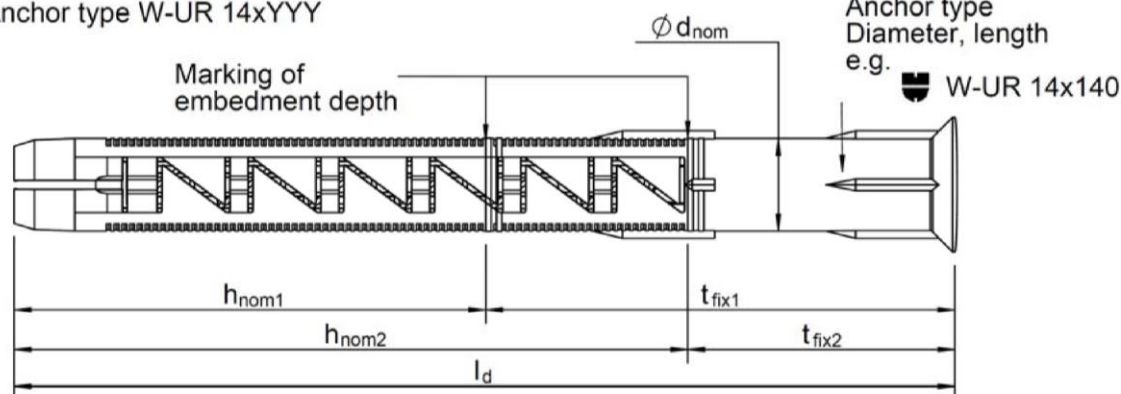
Annex A 4



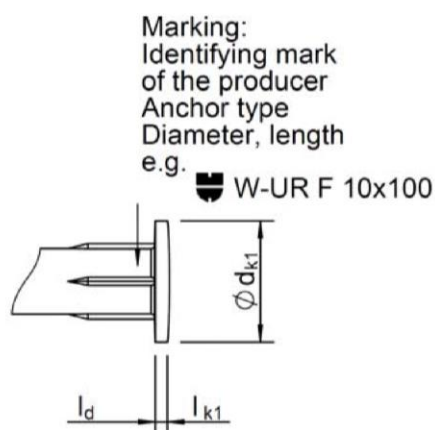
Anchor type W-UR 14xYYY



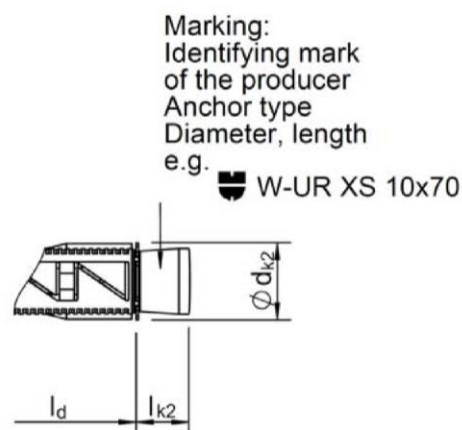
Anchor type W-UR 14xYYY



Anchor type W-UR F 6, 10 und 14



Anchor type W-UR XS 6, 10 und 14



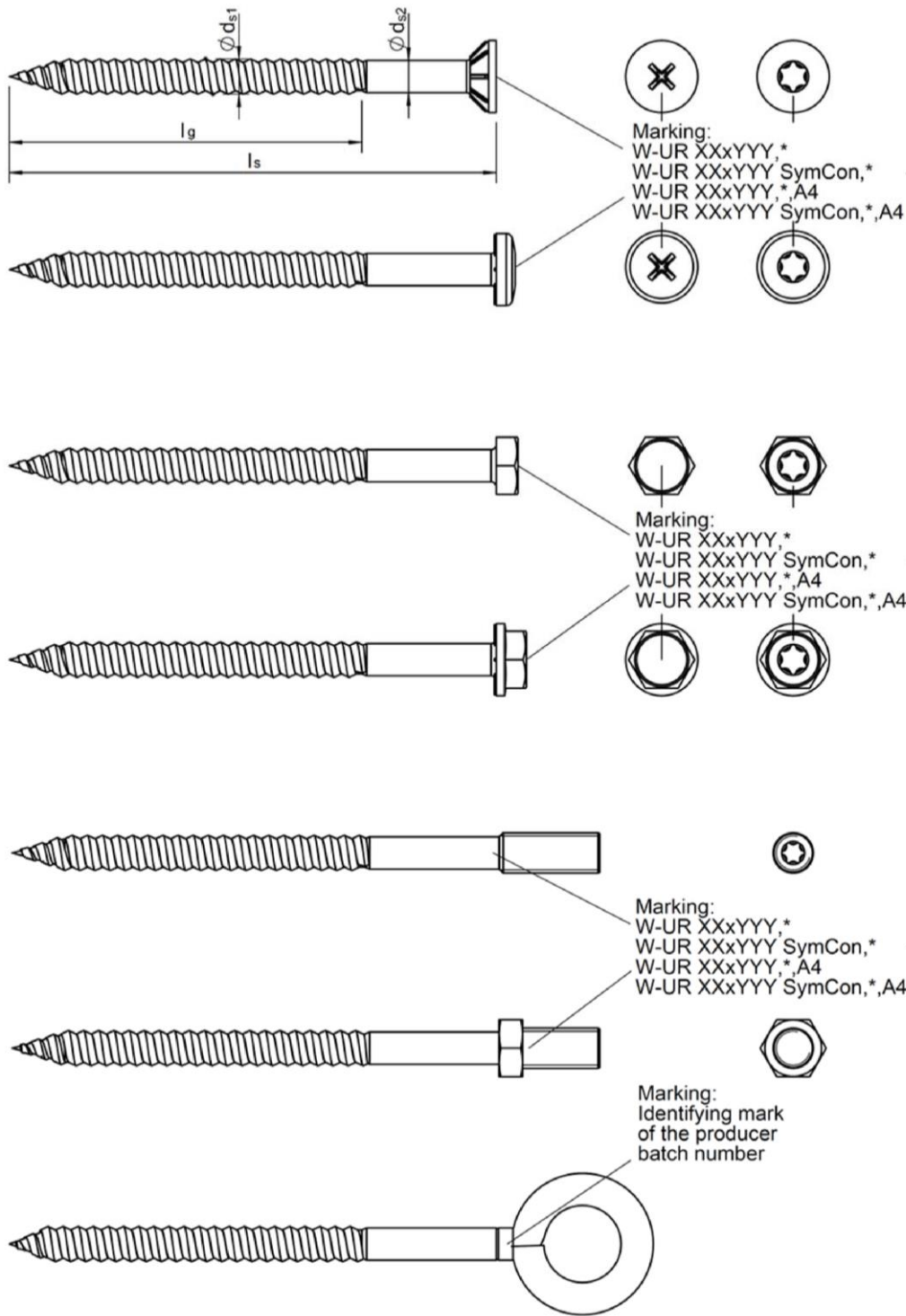
## Würth Plastic Anchor W-UR SymCon

### Product description

Anchor type W-UR 14 SymCon, head versions of the sleeve  
Marking and dimensions

## Annex A 5

Special screw



Würth Plastic Anchor W-UR SymCon

Annex A 6

Product description  
Specific screw – head versions marking

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

Anchor type		W-UR 6 SymCon 6 x l <sub>d</sub>	W-UR 10 SymCon 10 x l <sub>d</sub>		
Overall plastic anchor embedment depth <sup>1),2)</sup>	h <sub>nom</sub> ≥ [mm]	50	40	40 (h <sub>nom1</sub> ) or 50 (h <sub>nom2</sub> )	40 (h <sub>nom1</sub> ) 50 (h <sub>nom2</sub> ) or 70 (h <sub>nom3</sub> )
Plastic sleeve					
Plastic sleeve diameter	∅ d <sub>nom</sub> = [mm]	6	10		
Length of plastic sleeve	l <sub>d</sub> [mm]	≥ 50	≥ 40	≥ 50	≥ 70
Flat collar diameter	∅ d <sub>k1</sub> = [mm]	12.5	18		
	∅ d <sub>k2</sub> = [mm]	-	11.5		
Thickness of flat collar	l <sub>k1</sub> ≥ [mm]	1.2	2		
	l <sub>k2</sub> ≥ [mm]	-	7.8		
Thickness of fixture	t <sub>fix</sub> ≥ [mm]	0	0		
Special screw					
Screw diameter	d <sub>s1</sub> = [mm]	5	7.2		
Screw diameter	d <sub>s2</sub> = [mm]	4.55	7		
Length of screw	l <sub>s</sub> = [mm]	l <sub>d</sub> + 5 mm	l <sub>d</sub> + 5 mm		
Length of thread	l <sub>g</sub> = [mm]	55	45	75	75

<sup>1)</sup> See Annex A 1, A 2

<sup>2)</sup> For hollow and perforated masonry the influence of h<sub>nom</sub> > 70 mm (W-UR 10 SymCon) has to be detected by job site tests according ETAG 020 Annex B

**Table A 1.2: Anchor dimensions W-UR 14 SymCon**

Anchor type		W-UR 14 SymCon	
		14 x 80	14 x l <sub>d</sub>
Overall plastic anchor embedment depth <sup>1),2)</sup>	h <sub>nom</sub> ≥ [mm]	70	70 (h <sub>nom1</sub> ) or 100 (h <sub>nom2</sub> )
Plastic sleeve			
Plastic sleeve diameter	∅ d <sub>nom</sub> = [mm]	14	
Length of plastic sleeve	l <sub>d</sub> [mm]	= 80	≥ 110
Flat collar diameter	∅ d <sub>k1</sub> = [mm]	24	
Thickness of flat collar	l <sub>k1</sub> ≥ [mm]	3	
Thickness of fixture	t <sub>fix</sub> ≥ [mm]	0	
Special screw			
Screw diameter	d <sub>s1</sub> = [mm]	10.5	
Screw diameter	d <sub>s2</sub> = [mm]	9.6	9.6 (head-form loop: 9.6 or 12.0)
Length of screw	l <sub>s</sub> = [mm]	l <sub>d</sub> + 5 mm	
Length of thread	l <sub>g</sub> = [mm]	75	105

<sup>1)</sup> See Annex A 3

<sup>2)</sup> For hollow and perforated masonry the influence of h<sub>nom</sub> > 100 mm (W-UR 14 SymCon) has to be detected by job site tests according ETAG 020 Annex B

**Würth Plastic Anchor W-UR SymCon**

**Product description**  
Dimensions

**Annex A 7**

**Table A 2.1 Materials**

Designation	Material
Plastic sleeve	Polyamide, colour brown
Special screw	Carbon steel, according to EN ISO 4042:1999, 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 EN ISO 4042:1999, galvanised
Special screw – head-form loop $d_{s2} = 12 \text{ mm}$	Carbon steel, according to EN ISO 4042:1999, galvanised

**Würth Plastic Anchor W-UR SymCon**

**Product description**  
Materials

**Annex A 8**



### Specifications of intended use

#### Anchorage subject to:

- Static and quasi-static loads:
- Multiple fixing of non-structural applications

#### Base materials:

- Reinforced or unreinforced normal weight concrete with strength classes  $\geq C12/15$  (use category a), according to EN 206-1:2000 (Annex C 1, C 2). Precast or prestressed hollow core elements (Annex C 31), weather resistant skins (Annex C 32, C 33).
- Solid brick masonry (use category b) according to Annex C 8, C 9, C 20, C 21, C 25 – C 28.  
Note: The characteristic resistance is also valid for larger brick sizes and larger compressive strength of the masonry unit.
- Hollow brick masonry (use category c) according to Annex C 10 – C 19, C 22 – C 24, C 29
- Autoclaved aerated concrete (use category d), according to Annex C 30.
- Mortar strength class of the masonry  $\geq M2,5$  at minimum according to EN 998-2:2010.
- For other base materials of the use categories a, b, c and d the characteristic resistance of the anchor may be determined by job site tests according to ETAG 020, Annex B Edition March 2012.

#### Temperature Range:

- Temperature Range b):  $-40\text{ °C}$  to  $+80\text{ °C}$  (max. long term temperature  $+50\text{ °C}$  and max. short term temperature  $+80\text{ °C}$ )
- Temperature Range c):  $-40\text{ °C}$  to  $+50\text{ °C}$  (max long term temperature  $+30\text{ °C}$  and max. short term temperature  $+50\text{ °C}$ )

#### Use conditions (Environmental conditions):

- Structures subject to dry internal conditions (zinc coated steel, stainless steel).
- The specific screw made of galvanized steel 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).
- Structures subject to external atmospheric exposure (including industrial and marine environment) and to permanently damp internal condition, if no particular aggressive conditions exist (stainless steel).
- Note: 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).

#### Design:

- The anchorages are designed in accordance with the ETAG 020, Annex C Edition March 2012 under the responsibility of an engineer experienced in anchorages and masonry work.
- No reduction factor  $\alpha_j$  and no limitation of the design resistance  $N_{Rd}$  for the anchor type W-UR 14 SymCon 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.
- 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 position of the anchor is indicated on the design drawings.
- Fasteners are only to be used for multiple use for non-structural application, according to ETAG 020 Edition March 2012.

#### Installation:

- Hole drilling by the drill modes according to Annex C 8 - C 33.
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site
- Installation temperature from  $\geq -40\text{ °C}$
- Exposure to UV due to solar radiation of the anchor not protected  $\leq 6$  weeks

### Würth Plastic Anchor W-UR SymCon

#### Intended use Specifications

### Annex B 1

**Table B 2.1: Installation parameters W-UR 6 SymCon, W-UR 10 SymCon**

Anchor type		W-UR 6 SymCon 6 x l <sub>d</sub>	W-UR 10 SymCon 10 x l <sub>d</sub>		
Drill hole diameter	d <sub>0</sub> = [mm]	6	10		
Overall plastic anchor embedment depth <sup>1),2)</sup>	h <sub>nom</sub> ≥ [mm]	50	40	40 (h <sub>nom1</sub> ) or 50 (h <sub>nom2</sub> )	40 (h <sub>nom1</sub> ) 50 (h <sub>nom2</sub> ) or 70 (h <sub>nom3</sub> )
Cutting diameter of drill bit	d <sub>cut</sub> ≤ [mm]	6.4	10.45		
Depth of drill hole to deepest point <sup>1)</sup>	h <sub>1</sub> ≥ [mm]	60	50	50 (h <sub>1,1</sub> ) or 60 (h <sub>1,2</sub> )	50 (h <sub>1,1</sub> ) 60 (h <sub>1,2</sub> ) or 80 (h <sub>1,3</sub> )
Diameter of clearance hole in the fixture	d <sub>f</sub> ≤ [mm]	6.5	10.5		

<sup>1)</sup> See Annex A 1, A 2

<sup>2)</sup> For hollow and perforated masonry the influence of h<sub>nom</sub> > 70 mm (W-UR 10 SymCon) has to be detected by job site tests according ETAG 020 Annex B

**Table B 2.2: Installation parameters W-UR 14 SymCon**

Anchor type		W-UR 14 SymCon	
		14 x 80	14 x l <sub>d</sub>
Drill hole diameter	d <sub>0</sub> = [mm]	14	
Overall plastic anchor embedment depth <sup>1),2)</sup>	h <sub>nom</sub> ≥ [mm]	70	70 (h <sub>nom1</sub> ) or 100 (h <sub>nom2</sub> )
Cutting diameter of drill bit	d <sub>cut</sub> ≤ [mm]	14.45	
Depth of drill hole to deepest point <sup>1)</sup>	h <sub>1</sub> ≥ [mm]	80	80 (h <sub>1,1</sub> ) or 110 (h <sub>1,2</sub> )
Diameter of clearance hole in the fixture	d <sub>f</sub> ≤ [mm]	14.5	

<sup>1)</sup> See Annex A 3

<sup>2)</sup> For hollow and perforated masonry the influence of h<sub>nom</sub> > 100 mm (W-UR 14 SymCon) has to be detected by job site tests according ETAG 020 Annex B.

For anchorages in hollow and perforated masonry with anchor type W-UR 14 SymCon 14 x l<sub>d</sub> (with h<sub>nom1</sub> = 70 mm and h<sub>nom2</sub> = 100 mm) variable set in the range h<sub>nom1</sub> = 70 mm ≤ h<sub>nom</sub> < 100 mm = h<sub>nom2</sub> the characteristic values F<sub>Rk</sub> for h<sub>nom1</sub> = 70 mm may be taken without performing additional job site tests (compare Annex C 17, C 18, C 24).

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

**Würth Plastic Anchor W-UR SymCon**

**Intended use**  
Installation parameters

**Annex B 2**

**Table B 3.1: Minimum thickness of member, edge distance and anchor spacing in concrete**

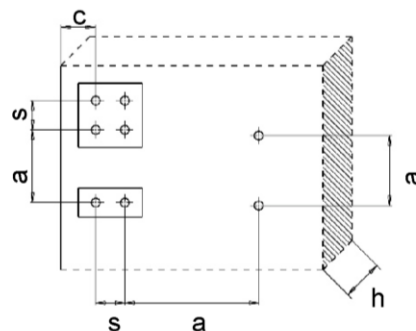
**W-UR 6 SymCon:** Fixing points with a spacing  $a \leq 55$  mm are considered as a group with a max. characteristic resistance  $N_{Rk,p}$  acc. to Table C 2.1. For  $a > 55$  mm, the anchors are considered as single anchors, each with a characteristic resistance  $N_{Rk,p}$  acc. to Table C 2.1.

**W-UR 10 SymCon:** Fixing points with a spacing  $a \leq 125$  mm are considered as a group with a max. characteristic resistance  $N_{Rk,p}$  acc. to Table C 2.1. For  $a > 125$  mm, the anchors are considered as single anchors, each with a characteristic resistance  $N_{Rk,p}$  acc. to Table C 2.1.

**W-UR 14 SymCon:** Fixing points with a spacing  $a \leq 125$  mm are considered as a group with a max. characteristic resistance  $N_{Rk,p}$  acc. to Table C 4.1. For  $a > 125$  mm, the anchors are considered as single anchors, each with a characteristic resistance  $N_{Rk,p}$  acc. to Table C 4.1.

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

Concrete:  
(Table B 2.1)



**Würth Plastic Anchor W-UR SymCon**

**Intended use**

Minimum member thickness, edge distances and spacings for use concrete

**Annex B 3**

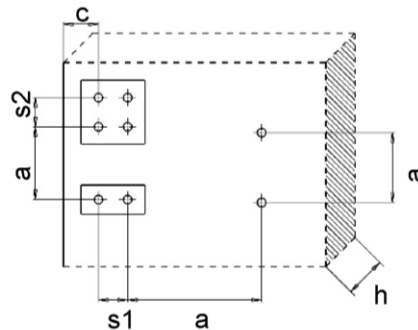
**Table B 4.1: Minimum thickness of member, edge distance and anchor spacing in masonry and autoclaved aerated concrete**

			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]	50	70	70	100
Minimum thickness of member	$h_{min}$	[mm]	115 <sup>1)</sup>		100	100 <sup>1)</sup>
Single anchor						
Minimum allowable spacing	$a_{min}$	[mm]	250		250	250
Minimum allowable edge distance	$c_{min}$	[mm]	100 <sup>1)</sup>		60	100 (240) <sup>2)</sup>
Anchor group						
Spacing perpendicular to free edge	$s_{1,min}$	[mm]	100		100	200 (400) <sup>2)</sup>
Spacing parallel to free edge	$s_{2,min}$	[mm]	100		100	400 (960) <sup>2)</sup>
Minimum allowable edge distance	$c_{min}$	[mm]	100 <sup>1)</sup>		60	100 (240) <sup>2)</sup>
Distance between anchor groups	$a$	[mm]	250		250	400 (960) <sup>2)</sup>

<sup>1)</sup> depends on the brick size (see the following Annex C 8 - Annex C 33)

<sup>2)</sup> depends on brick (see the following Annex C 8 - Annex C 33) – the values in brackets govern for masonry units with a height < 100 mm

Masonry  
(Table B 3.1)



**Würth Plastic Anchor W-UR SymCon**

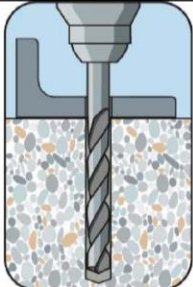
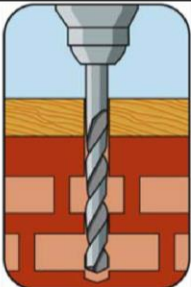
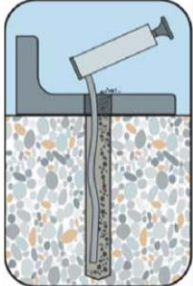
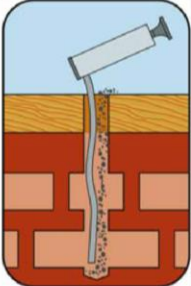
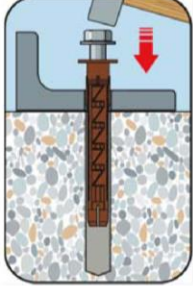
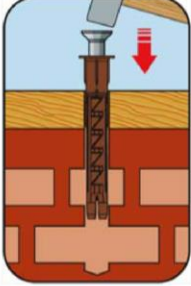
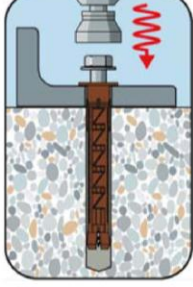
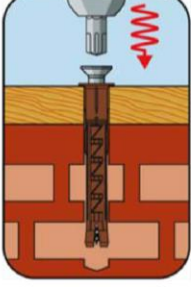
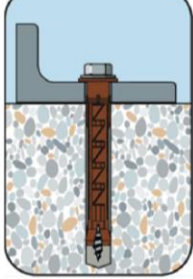
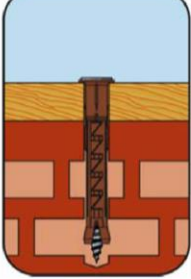
**Intended use**

Minimum member thickness, edge distances and spacings for use in masonry and AAC

**Annex B 4**



## Installation Instructions

		Drill the bore hole
		Clean the drilled bore hole
		Gently hammer the fastener into the hole
		Gently hammer the fastener into the hole Insert the special screw into the sleeve
		Tighten the screw 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.

Würth Plastic Anchor W-UR SymCon

Intended use  
Installation instructions

Annex B 5

**Table C 1.1: Characteristic resistance of the screw (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								
Overall plastic anchor embedment depth	$h_{nom}$	[mm]	50	40	50	70	50	40	50	70
Screw diameter	$d_{s1}/d_{s2}$	[mm]	5 / 4.55	7.2 / 6.6			5 / 4.55	7.2 / 6.6		
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		
Characteristic bending moment	$M_{Rk,s}$	[kN]	4.19	17.67			4.89	20.62		
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1.25	1.25			1.56	1.56		

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

**Table C 2.1: Characteristic resistance for pullout failure 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	50	70	50	40	50	70
Concrete $\geq$ C16/20										
Characteristic resistance	$30^{\circ}\text{C}^{(2)} / 50^{\circ}\text{C}^{(3)}$	$N_{Rk,p}$ [kN]	2.0	4.5	5.0	8.5	2.0	4.5	5.0	8.5
	$50^{\circ}\text{C}^{(2)} / 80^{\circ}\text{C}^{(3)}$	$N_{Rk,p}$ [kN]	-	4.0	4.5	7.5	-	4.0	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	4.0	6.0	2.0	3.5	4.0	6.0
	$50^{\circ}\text{C}^{(2)} / 80^{\circ}\text{C}^{(3)}$	$N_{Rk,p}$ [kN]	-	3.0	3.5	5.0	-	3.0	3.5	5.0
Partial safety factor		$\gamma_{Mc}^{(1)}$ [-]	1.8	1.8			1.8	1.8		

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

<sup>2)</sup> Maximum long term temperature

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

## Würth Plastic Anchor W-UR SymCon

### Performances

Characteristic resistance of the screw, Characteristic resistance for pullout failure for use in concrete (W-UR 6 SymCon, W-UR 10 SymCon)

## Annex C 1

**Table C 3.1: Characteristic resistance for the screw 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				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	10.5 / 9.6	
Characteristic tension resistance	$N_{Rk,s}$	[kN]	33.25		33.25	22.17	33.25	22.17	38.79	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1.5		1.5		1.5		1.87	
Characteristic shear resistance	$V_{Rk,s}$	[kN]	16.63		16.63	11.08	16.63	11.08	19.4	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1.25		1.25		1.25		1.56	
Characteristic bending moment of special screw										
Characteristic bending moment	$M_{Rk,s}$	[kN]	41,9		41,9		27,93		48,88	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,25		1,25		1,25		1,56	

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

**Table C 4.1: Characteristic resistance for pullout failure for use in concrete W-UR 14 SymCon**

Anchor type			Galvanised steel W-UR SymCon				Stainless steel W-UR SymCon	
Pull-out failure (plastic sleeve)			14		Head-form Loop 14		14	
Overall plastic anchor embedment depth	$h_{nom}$	[mm]	70	100	70	100	70	100
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	
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	

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

<sup>2)</sup> Maximum long term temperature

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

**Würth Plastic Anchor W-UR SymCon**

**Performances**

Characteristic resistance of the screw, Characteristic resistance for pullout failure for use in concrete (W-UR 14 SymCon)

**Annex C 2**

**Table C 5.1: Displacements<sup>1)</sup> under tension and shear loading in concrete and masonry**

Anchor type	$h_{nom}$ [mm]	Tension load			Shear load		
		$F^{2)}$ [kN]	$\delta_{N0}$ [mm]	$\delta_{N\infty}$ [mm]	$F^{2)}$ [kN]	$\delta_{V0}$ [mm]	$\delta_{V\infty}$ [mm]
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

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

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

**Table C 6.1: Displacements<sup>1)</sup> under tension and shear loading in autoclaved aerated concrete (AAC)**

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

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

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

**Table C 7.1: Characteristic values under fire exposure in concrete C20/25 to C50/60 in any load direction, no permanent centric tension load and without lever arm, fastening of facade systems**

Anchor type	Fire resistance class	$F^{1)}$
W-UR 10 SymCon	R 90	0.8 kN
W-UR 14 SymCon	R 90	0.8 kN

<sup>1)</sup>  $F = F_{Rk} / (\gamma_M \times \gamma_F)$

**Würth Plastic Anchor W-UR SymCon**

**Performances**

Displacements under tension and shear loading in concrete  
Characteristic resistance under fire exposure in concrete

**Annex C 3**



**Table C 8.1: Base material: Concrete, solid masonry**

Base material	Format	Measurement [mm]	Minimum compressive strength [N/mm <sup>2</sup> ]	Bulk density class [kg/dm <sup>3</sup> ]	Annex
<b>Concrete (use category "a")</b>					
<b>Concrete ≥ C12/15</b>					<b>Annex C 1 - C 2</b>
<b>Solid masonry (use category "b")</b>					
<b>Solid brick Mz</b> acc. to DIN 105-100:2012-01, EN 771-1:2011 e.g. Wienerberger GmbH	≥ NF	≥ 240x115x71	10 20	≥ 1,8	<b>Annex C 8</b> 771-1-020
	≥ 3DF	240x175x113	28 36		<b>Annex C 9</b> 771-1-041
<b>Sand-lime solid brick KS</b> acc. to DIN V 106:2005-10, EN 771-2:2011	≥ NF	≥ 240x115x71	10 20	≥ 2,0	<b>Annex C 20</b> 771-2-011
<b>Sand-lime solid brick Silka XL Basic,</b> <b>Sand-lime solid brick Silka XL Plus,</b> acc. to DIN V 106:2005-10, EN 771-2:2011, Z-17.1-997 e.g. Xella International GmbH		≥ 248x175x498	10 20 28	≥ 2,0	<b>Annex C 21</b> 771-2-010
<b>Concrete solid block - Vn and Vbn</b> acc. to DIN 18153-100:2005-10, EN 771-3:2011 Bisotherm GmbH	≥ NF	≥ 240x115x71	10 20 28	≥ 2,0	<b>Annex C 25</b> 771-3-004
<b>Lightweight concrete solid block – V and Vbl; e.g. Bisophon</b> acc. to DIN V 18152-100:2005-10 EN 771-3:2011 Bisotherm GmbH	≥ 3DF	≥ 240x175x113	10 20	≥ 2,0	<b>Annex C 26</b> 771-3-017
<b>Lightweight concrete solid brick</b> <b>e.g. Bisobims V and Vbl</b> acc. to DIN V 18152-100:2005-10 EN 771-3:2011 Bisotherm GmbH	≥ NF	≥ 240x115x71	2 4	≥ 1,0	<b>Annex C 27</b> 771-3-007
<b>Lightweight concrete solid brick</b> <b>e.g. Bisobims V and Vbl</b> acc. to DIN V 18152-100:2005-10 EN 771-3:2011 Bisotherm GmbH	≥ 3DF	≥ 240x175x113	2 4	≥ 1,0	<b>Annex C 28</b> 771-3-016

**Würth Plastic Anchor W-UR SymCon**

**Performances**

Solid masonry (use category "b"), format, measurement, minimum compressive strength, bulk density class, Annex

**Annex C 4**

**Table C 9.1: Base material: Hollow or perforated masonry**

Base material	Format	Measurement [mm]	Minimum compressive strength [N/mm <sup>2</sup> ]	Bulk density class [kg/dm <sup>3</sup> ]	Annex
<b>Hollow or perforated masonry (use category "c")</b>					
<b>Hollow brick HLz</b> acc. to DIN 105-100:2012-01 EN 771-1:2011 e.g. Wienerberger GmbH e.g. Schlagmann Baustoffwerke GmbH & Co. KG	≥ 2DF	≥ 240x115x113	10 20	≥ 1,2	<b>Annex C 10</b>  771-1-021
<b>Hollow brick HLz</b> acc. to DIN 105-100:2012-01 EN 771-1:2011 e.g. Wienerberger GmbH e.g. Schlagmann Baustoffwerke GmbH & Co. KG	≥ 12DF	≥ 373x240x238	6 8 10	≥ 1,2	<b>Annex C 11</b>  771-1-036
<b>Hollow brick HLz T14-24,0</b> EN 771-1:2011 Z-17.1-651 Wienerberger GmbH	≥ 10DF	≥ 308x240x249	6	≥ 0,7	<b>Annex C 12</b>  771-1-048
<b>Hollow brick POROTON-T8-P</b> acc. to T8: EN 771-1:2011; Z-17.1-982 Wienerberger GmbH Schlagmann Baustoffwerke GmbH & Co. KG	≥ 10DF	≥ 248x300x249	4 6 8	≥ 0,6	<b>Annex C 13</b>  771-1-022
<b>Hollow brick POROTON-T9-P</b> acc. to T9: EN 771-1:2011; Z-17.1-674 Wienerberger GmbH Schlagmann Baustoffwerke GmbH & Co. KG	≥ 10DF	≥ 248x300x249	6 8	≥ 0,6	<b>Annex C 14</b>  771-1-045
<b>Hollow brick POROTON S10</b> acc. to EN 771-1:2011 Z-17.1-1017 Wienerberger GmbH Schlagmann Baustoffwerke GmbH & Co. KG	≥ 10DF	≥ 248x300x249	8	≥ 0,75	<b>Annex C 15</b>  771-1-032
<b>Hollow brick POROTON-S11-P 30,0</b> acc. to EN 771-1:2011 Z-17.1-812 Wienerberger GmbH Schlagmann Baustoffwerke GmbH & Co. KG	≥ 10DF	≥ 248x300x249	8	≥ 0,9	<b>Annex C 16</b>  771-1-046
<b>Hollow brick ThermoPlan MZ10</b> EN 771-1:2011 Z-17.1-1015 Mein Ziegelhaus GmbH & Co. KG	≥ 10DF	≥ 248x300x249	8	≥ 0,75	<b>Annex C 17</b>  771-1-034

**Würth Plastic Anchor W-UR SymCon**

**Performances**

Hollow or perforated masonry (use category "c"), format, measurement, minimum compressive strength, bulk density class, Annex

**Annex C 5**

Base material	Format	Measurement [mm]	Minimum compressive strength [N/mm <sup>2</sup> ]	Bulk density class [kg/dm <sup>3</sup> ]	Annex
Hollow or perforated masonry (use category "c")					
Hollow brick ThermoPlan TS <sup>2</sup> EN 771-1:2011 Z-17.1-993 Mein Ziegelhaus GmbH & Co. KG	≥ 9DF	≥ 373x175x249	6 8 10 12 20	≥ 0,9	Annex C 18     771-1-024
Hollow brick THERMOPOR TV 9-Plan EN 771-1:2011 Z-17.1-1006 Thermopor Ziegel-Kontor Ulm GmbH	≥ 10DF	≥ 247x300x249	4 6 8	≥ 0,75	Annex C 19     771-1-029
Sand-lime perforated brick KS L acc. to DIN V 106:2005-10 EN 771-2:2011	≥ 2DF	≥ 240x115x113	6 8 10 12	≥ 1,4	Annex C 22     771-2-004
Sand-lime perforated brick KS L acc. to DIN V 106:2005-10 EN 771-2:2011 e.g. Xella International GmbH	≥ 8DF	≥ 248x240x238	6 8 10 12	≥ 1,4	Annex C 23     771-2-013
Sand-lime perforated brick KS L acc. to DIN V 106:2005-10 EN 771-2:2011 e.g. Xella International GmbH	≥ 9DF	≥ 373x175x238	6 8 10 12 20	1,4	Annex C 24     771-2-008
Hollow brick lightweight concrete 3K Hbl DIN V 18151-100:2005-10 EN 771-3:2011 e.g. Heinzmann Baustoffe GmbH, Liapor GmbH & Co. KG	≥ 16DF	≥ 498x240x238	2 4 6	≥ 0,7	Annex C 29     771-3-005
Würth Plastic Anchor W-UR SymCon					Annex C 6
Performances Hollow or perforated masonry (use category "c"), format, measurement, minimum compressive strength, bulk density class, Annex					

**Table C 10.1: Base material: Autoclaved aerated concrete (AAC)**

Base material	Format	Measurement [mm]	Minimum compressive strength [N/mm <sup>2</sup> ]	Bulk density class [kg/dm <sup>3</sup> ]	Annex
Autoclaved aerated concrete AAC e.g. EN 771-4:2011		≥ 498x100x249	2 - 7	≥ 0,3	<b>Annex C 30</b>

**Table C 11.1: Base material: Precast prestressed hollow core slabs**

Base material	Format	Measurement [mm]	Minimum compressive strength [N/mm <sup>2</sup> ]	Bulk density class [kg/dm <sup>3</sup> ]	Annex
Precast prestressed hollow core slabs e.g. DIN EN 1168:2011-12	-	-	≥ C30/37	-	<b>Annex C 31</b>

**Table C 12.1: Base material: Thin concrete plates, Weather Resistant Skins of External Wall Panels**

Base material	Format	Measurement [mm]	Minimum compressive strength [N/mm <sup>2</sup> ]	Bulk density class [kg/dm <sup>3</sup> ]	Annex
Thin concrete plates, Weather Resistant Skins of External Wall Panels	-	-	≥ C16/20	-	<b>Annex C 32 - Annex C 33</b>

**Würth Plastic Anchor W-UR SymCon**

**Performances**

Autoclaved aerated concrete, precast prestressed hollow core slabs, thin concrete plate,  
format, measurement, minimum compressive strength, bulk density class, Annex

**Annex C 7**

**Base material solid masonry: Solid brick Mz, NF**

**Table C 13.1.1: Brick data**

Description of brick	771-1-020	Mz
Type of brick		Solid brick Mz
Bulk density	$\rho \geq$ [kg/dm <sup>3</sup> ]	1.8
Standard, approval		DIN 105-100:2012-01; EN 771-1:2011
Format (measurement)	[mm]	$\geq$ NF ( $\geq 240 \times 115 \times 71$ )
Minimum thickness of member	$h_{\min} =$ [mm]	115

**Table C 13.1.2: 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]	60	80
Drill method	[-]	Hammer drilling	
Overall plastic anchor embedment depth	$h_{\text{nom}} =$ [mm]	50	70
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	10.5	14.5
Minimum allowable edge distance	$c_{\min} \geq$ [mm]	250	100

**Table C 13.1.3: 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	$h_{\text{nom}} =$ [mm]	50	70
<b>Solid brick Mz, <math>f_b \geq 10 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$ [kN]	1.5	0.9
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	1.5	0.75
<b>Solid brick Mz, <math>f_b \geq 20 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$ [kN]	1.5	1.2
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	1.5	1.2
<b>Solid brick Mz, <math>f_b \geq 28 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$ [kN]	2.5	2.0
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	2.5	2.0
<b>Solid brick Mz, <math>f_b \geq 36 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$ [kN]	3.0	2.5
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	3.0	2.5
Partial safety factor	$\gamma_{Mm}^{2)}$ [-]	2.5	2.5

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

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C.

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

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

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

**Würth Plastic Anchor W-UR SymCon**

**Performances**

Solid masonry: Solid brick Mz, NF

Brick data, installation parameters, characteristic resistance

**Annex C 8**

**Base material solid masonry: Solid brick Mz, 3DF**

**Table C 13.2.1: Brick data**

Description of brick		771-1-041	Mz
Type of brick			Solid brick Mz
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	1.8
Standard, approval			DIN 105-100:2012-01; EN 771-1:2011
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 C 13.2.2: 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	$d_{cut} \leq$	[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	$h_{nom} \geq$	[mm]	70	100
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	10.5	14.5
Minimum allowable edge distance	$c_{min} \geq$	[mm]	100	100

**Table C 13.2.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> 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, $f_b \geq 10 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	2.5	4.0
	Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	2.5	3.5
Solid brick Mz, $f_b \geq 20 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	4.0	5.5
	Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	4.0	5.5
Solid brick Mz, $f_b \geq 28 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	5.5	5.5
	Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	5.5	5.5
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	2.5	2.5

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

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{min}$  according to Table B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C.

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

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

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

**Würth Plastic Anchor W-UR SymCon**

**Performances**

Solid masonry: Solid brick Mz, 3DF

Brick data, installation parameters, characteristic resistance

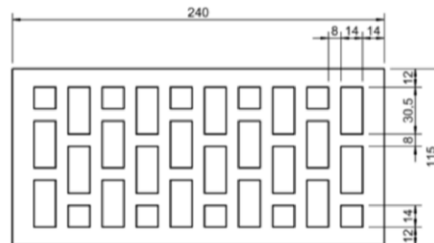
**Annex C 9**



**Base material hollow masonry: Hollow brick HLz, 2DF**

**Table C 13.3.1: Brick data**

Description of brick		771-1-021	HLz
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	1.2
Standard, approval			DIN 105-100:2012-01; EN 771-1:2011
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 C 13.3.2: 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]	100

**Table C 13.3.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> 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 B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C.
- 2) In absence of other national regulations
- 3) Maximum long term temperature
- 4) Maximum short term temperature

**Würth Plastic Anchor W-UR SymCon**

**Performances**

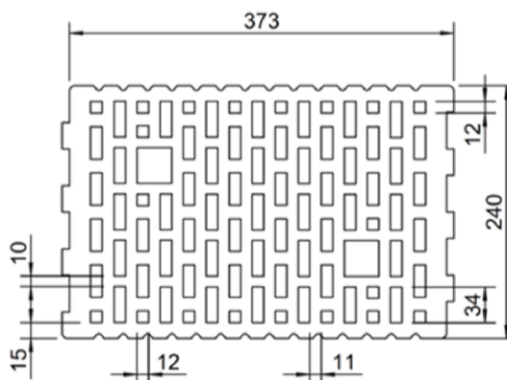
Hollow masonry: Hollow brick HLz, 2DF  
Brick data, installation parameters, characteristic resistance

**Annex C 10**

**Base material hollow masonry: Hollow brick HLz, 12DF**

**Table C 13.4.1: Brick data**

Description of brick		771-1-036	HLz
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	1.2
Standard, approval			DIN 105-100:2012-01; EN 771-1:2011
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 C 13.4.2: Installation parameters**

Anchor size		W-UR 10 SymCon	W-UR 14 SymCon
Drill hole diameter	$d_0$	[mm]	10
Cutting diameter of drill bit	$d_{cut} \leq$	[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]	100

**Table C 13.4.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 10 SymCon	W-UR 14 SymCon
Overall plastic anchor embedment depth	$h_{nom} =$	[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
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

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

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{min}$  according to Table B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C.

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

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

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

**Würth Plastic Anchor W-UR SymCon**

**Performances**

Hollow masonry: Hollow brick HLz, 12DF

Brick data, installation parameters, characteristic resistance

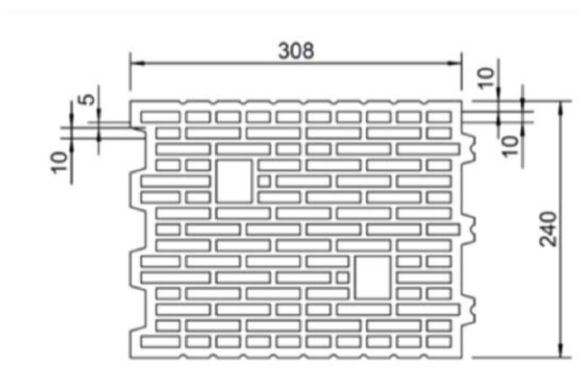
**Annex C 11**



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

**Table C 13.5.1: Brick data**

Description of brick		771-1-048	HLz T14-24,0
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.7
Standard, approval			EN 771-1:2011, 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 C 13.5.2: 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	$h_1 \geq$	110
Drill method		Rotary drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	100
Diameter of clearance hole in the fixture	$d_f \leq$	14.5
Minimum allowable edge distance	$c_{\min} \geq$	100

**Table C 13.5.3: Characteristic resistance  $F_{Rk}^{1)}$  in [kN] for single anchor**

Anchor size		W-UR 14 SymCon
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	100
Hollow brick HLz T14-24,0, $f_b \geq 6 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	0.6
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	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 B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C.
- 2) In absence of other national regulations
- 3) Maximum long term temperature
- 4) Maximum short term temperature

**Würth Plastic Anchor W-UR SymCon**

**Performances**

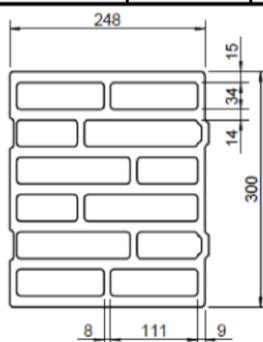
Hollow masonry: Hollow brick HLz, T14-24,0  
Brick data, installation parameters, characteristic resistance

**Annex C 12**

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

**Table C 13.6.1: 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 <sup>3</sup> ]	0.6
Standard, approval			T8: EN 771-1:2011; 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 C 13.6.2: Installation parameters**

Anchor size		W-UR 10 SymCon	W-UR 14 SymCon
Drill hole diameter	$d_0 =$	[mm]	10
Cutting diameter of drill bit	$d_{cut} \leq$	[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]	100

**Table C 13.6.3: 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	$h_{nom} =$	[mm]	70
POROTON-T8-30,0-P, $f_b \geq 4 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	0.6
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.6
POROTON-T8-30,0-P, $f_b \geq 6 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	0.9
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.9
POROTON-T8-30,0-P, $f_b \geq 8 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	0.9
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.9
Partial safety factor	$\gamma_{Mm}^{2)}$		2.5

- 1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{min}$  according to Table B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C.
- 2) In absence of other national regulations
- 3) Maximum long term temperature
- 4) Maximum short term temperature

**Würth Plastic Anchor W-UR SymCon**

**Performances**

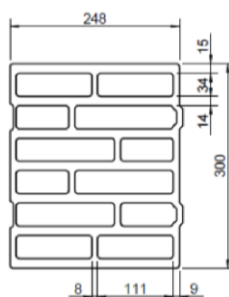
Hollow masonry: Hollow brick, POROTON-T8-30,0-P  
Brick data, installation parameters, characteristic resistance

**Annex C 13**

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

**Table C 13.7.1: 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 <sup>3</sup> ]	0.6
Standard, approval			T9: EN 771-1:2011; 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 C 13.7.2: 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 C 13.7.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size			W-UR 14 SymCon
Overall plastic anchor embedment depth	$h_{\text{nom}} =$	[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
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[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
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	2.0
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	2.5

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

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C.

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

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

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

**Würth Plastic Anchor W-UR SymCon**

**Performances**

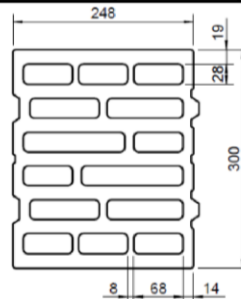
Hollow masonry: Hollow brick, POROTON-T9-30,0-P  
Brick data, installation parameters, characteristic resistance

**Annex C 14**

**Base material hollow masonry: Hollow brick POROTON S10**

**Table C 13.8.1: Brick data**

Description of brick		771-1-032	POROTON S10
Type of brick			Hollow brick POROTON S10
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.75
Standard, approval			S10: EN 771-1:2011; 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 C 13.8.2: 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 C 13.8.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size			W-UR 14 SymCon
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	100
POROTON S10-30, $f_b \geq 8 \text{ N/mm}^2$	$30^\circ\text{C}^{(3)} / 50^\circ\text{C}^{(4)}$	[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 B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C.
- 2) In absence of other national regulations
- 3) Maximum long term temperature
- 4) Maximum short term temperature

**Würth Plastic Anchor W-UR SymCon**

**Performances**

Hollow masonry: Hollow brick, POROTON-S10  
Brick data, installation parameters, characteristic resistance

**Annex C 15**

# Base material hollow masonry: Hollow brick POROTON S11

Table C 13.9.1: 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 <sup>3</sup> ]	0,9
Standard, approval			EN 771-1:2011; 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

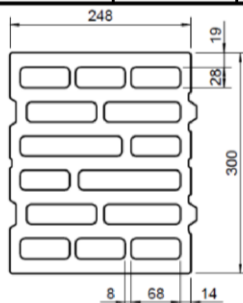


Table C 13.9.2: Installation parameters

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 C 13.9.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor

Anchor size			W-UR 14 SymCon
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	100
<b>POROTON S11-30-P, <math>f_b \geq 8 \text{ N/mm}^2</math></b>	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[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 B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C.
- 2) In absence of other national regulations
- 3) Maximum long term temperature
- 4) Maximum short term temperature

## Würth Plastic Anchor W-UR SymCon

### Performances

Hollow masonry: Hollow brick, POROTON-S11  
Brick data, installation parameters, characteristic resistance

## Annex C 16



# Base material hollow masonry: Hollow brick ThermoPlan MZ10

Table C 13.10.1: Brick data

Brick data	771-1-034	ThermoPlan MZ10
Type of brick		Hollow brick
Bulk density	$\rho \geq$ [kg/dm <sup>3</sup> ]	0.75
Standard, approval		EN 771-1:2011, 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

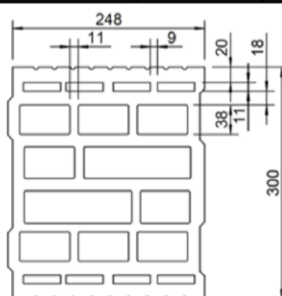


Table C 13.10.2: Installation parameters

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]	$\geq 70$ 100
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	14.5
Minimum allowable edge distance	$c_{min} \geq$ [mm]	100

Table C 13.10.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor

Anchor size		W-UR 14 SymCon
Overall plastic anchor embedment depth	$h_{nom}$ [mm]	$\geq 70$ <sup>5)</sup> = 100
Hollow brick ThermoPlan MZ10, $f_b \geq 8$ N/mm <sup>2</sup>	30°C <sup>3)</sup> / 50°C <sup>4)</sup> [kN]	2.0 2.5
Characteristic resistance $F_{Rk}$	50°C <sup>3)</sup> / 80°C <sup>4)</sup> [kN]	2.0 2.5
Partial safety factor	$\gamma_{Mm}$ <sup>2)</sup> [-]	2.5

- 1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{min}$  according to Table B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C.
- 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 B 2, Table B 2.2). 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

### Performances

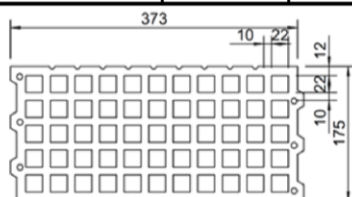
Hollow masonry: Hollow brick, ThermoPlan MZ10  
Brick data, installation parameters, characteristic resistance

Annex C 17

**Base material hollow masonry: Hollow brick ThermoPlan TS<sup>2</sup>**

**Table C 13.11.1: Brick data**

Brick data		771-1-024	ThermoPlan TS <sup>2</sup>
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.9
Standard, approval			EN 771-1:2011, 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 C 13.11.2: 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 C 13.11.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 14 SymCon	
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	$70 \text{ mm} \leq h_{nom} \leq 100 \text{ mm}$ <sup>5)</sup>
Hollow brick ThermoPlan TS <sup>2</sup> , $f_b \geq 6 \text{ N/mm}^2$ 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 <sup>2</sup> , $f_b \geq 8 \text{ N/mm}^2$ 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 <sup>2</sup> , $f_b \geq 10 \text{ N/mm}^2$ 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 <sup>2</sup> , $f_b \geq 12 \text{ N/mm}^2$ 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 <sup>2</sup> , $f_b \geq 20 \text{ N/mm}^2$ 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	$\gamma_{Mm}$ <sup>2)</sup>	[-]	2.5

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

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{min}$  according to Table B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C.

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

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

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

<sup>5)</sup> 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 B 2, Table B 2.2). 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**

**Performances**

Hollow masonry: Hollow brick, ThermoPlan TS<sup>2</sup>

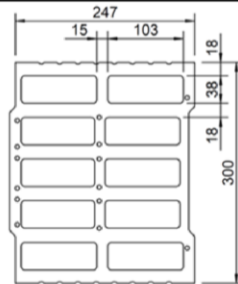
Brick data, installation parameters, characteristic resistance

**Annex C 18**

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

**Table C 13.12.1: Brick data**

Brick data		771-1-029	THERMOPOR TV 9-Plan
Type of brick			Hollow brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	0.75
Standard, approval			EN 771-1:2011, 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 C 13.12.2: 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 C 13.12.3: 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
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

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

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C.

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

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

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

**Würth Plastic Anchor W-UR SymCon**

**Performances**

Hollow masonry: Hollow brick, Thermopor TV 9-Plan  
Brick data, installation parameters, characteristic resistance

**Annex C 19**



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

**Table C 13.13.1: Brick data**

Description of brick		771-2-011	KS
Type of brick			Sand-lime solid brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	2.0
Standard, approval			DIN V 106:2005-10; EN 771-2:2011
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 C 13.13.2: 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]	60 80
Drill method		[-]	Hammer drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$	[mm]	50 70
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	10.5
Minimum allowable edge distance	$c_{\min} \geq$	[mm]	250 100

**Table C 13.13.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size		W-UR 10 SymCon	
Overall plastic anchor embedment depth	$h_{\text{nom}}$	[mm]	$\geq 50$ $\geq 70$
Sand-lime solid brick KS, $f_b \geq 10 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	0.6 1.2
	Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN] 0.6 1.2
Sand-lime solid brick KS, $f_b \geq 20 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	1.2 2.0
	Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN] 1.2 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 B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C
- 2) In absence of other national regulations
- 3) Maximum long term temperature
- 4) Maximum short term temperature

**Würth Plastic Anchor W-UR SymCon**

**Performances**

Solid masonry: Sand-lime solid brick KS, NF  
Brick data, installation parameters, characteristic resistance

**Annex C 20**

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

**Table C 13.14.1: 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 <sup>3</sup> ]	2.0
Standard, approval			DIN V 106:2005-10; EN 771-2:2011, 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 C 13.14.2: 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	$c_{\text{min}} \geq$	[mm]	100	100	60

**Table C 13.14.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

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

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

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C.

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

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

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

## Würth Plastic Anchor W-UR SymCon

## Annex C 21

### Performances

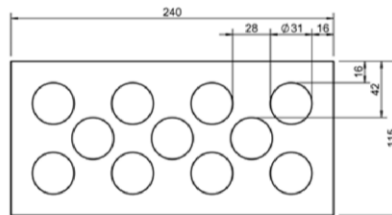
Base material solid masonry, sand-lime solid brick Silka XL Basic, Silka XL Plus

Brick data, installation parameters, characteristic resistance

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

**Table C 13.15.1: Brick data**

Description of brick	771-2-004	KS L
Type of brick		Sand-lime perforated brick
Bulk density $\rho \geq$	[kg/dm <sup>3</sup> ]	1.4
Standard, approval		DIN V 106:2005-10; EN 771-2:2011
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 C 13.15.2: 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]	100

**Table C 13.15.3: 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, $f_b \geq 6 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$ [kN]	1.2
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	0.9
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]	1.2
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]	2.0
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	1.5
Sand-lime perforated brick KS L, $f_b \geq 12 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$ [kN]	2.5
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	2.0
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 B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

**Würth Plastic Anchor W-UR SymCon**

**Performances**

Hollow masonry: Sand-lime perforated brick KS L, 2DF  
Brick data, installation parameters, characteristic resistance

**Annex C 22**

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

Table C 13.16.1: Brick data

Description of brick	771-2-013	KS L
Type of brick		Sand-lime perforated brick
Bulk density $\rho \geq$	[kg/dm <sup>3</sup> ]	1.4
Standard, approval		DIN V 106:2005-10; EN 771-2:2011
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

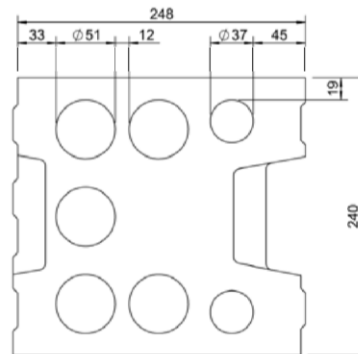


Table C 13.16.2: Installation parameters

Anchor size		W-UR 10 SymCon	W-UR 14 SymCon
Drill hole diameter $d_0 =$	[mm]	10	14
Cutting diameter of drill bit $d_{cut} \leq$	[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 $h_{nom} =$	[mm]	70	100
Diameter of clearance hole in the fixture $d_f \leq$	[mm]	10.5	14.5
Minimum allowable edge distance $c_{min} \geq$	[mm]	100	100

Table C 13.16.3: 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	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]	0.9	1.2
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	0.75	1.2
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]	1.2	1.5
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	0.9	1.5
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]	1.5	2.0
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	1.2	2.0
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]	2.0	2.5
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	1.5	2.5
Partial safety factor $\gamma_{Mm}^{2)}$	[-]	2.5	2.5

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

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{min}$  according to Table B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

## Würth Plastic Anchor W-UR SymCon

### Performances

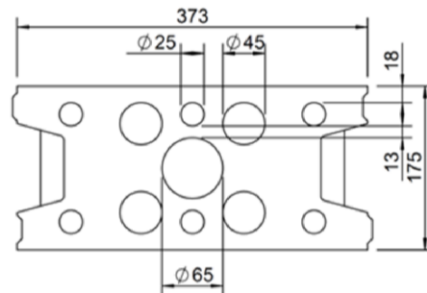
Hollow masonry: Sand-lime perforated brick KS L, 8DF  
Brick data, installation parameters, characteristic resistance

## Annex C 23

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

**Table C 13.17.1: Brick data**

Description of brick		771-2-008	KS L
Type of brick			Sand-lime perforated brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	1.4
Standard, approval			DIN V 106:2005-10; EN 771-2:2011
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 C 13.17.2: 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]	$\geq 70$ 100
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	14.5
Minimum allowable edge distance	$c_{\min} \geq$ [mm]	100

**Table C 13.17.3: Characteristic resistance  $F_{Rk1}$  in [kN] for single anchor**

Anchor size		W-UR 14 SymCon
Overall plastic anchor embedment depth	$h_{\text{nom}}$ [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
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	0.5
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
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	0.6
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
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	0.75
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
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	0.9
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
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [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 B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C.
- 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 B 2, Table B 2.2). 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**

**Performances**

Hollow masonry: Sand-lime perforated brick KS L, 9DF  
Brick data, installation parameters, characteristic resistance

**Annex C 24**



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

**Table C 13.18.1: Brick data**

Description of brick		771-3-004 (a)	Vn and Vbn
Type of brick			Concrete solid block
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	2.0
Standard, approval			DIN V 18153-100:2005-10; EN 771-3:2011
Producer of brick			-
Format (measurement)		[mm]	$\geq$ NF ( $\geq 240 \times 115 \times 71$ )
Minimum thickness of member	$h_{\min} =$	[mm]	115

**Table C 13.18.2: 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]		60
Drill method		[-]		Hammer drilling
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$	[mm]		50
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]		10.5
Minimum allowable edge distance	$c_{\min} \geq$	[mm]		250

**Table C 13.18.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> 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]		50
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
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]		2.0
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]		2.5
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]		2.5
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]		4.0
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]		4.0
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]		2.5

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

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C.

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

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

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

### Würth Plastic Anchor W-UR SymCon

#### Performances

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

### Annex C 25

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

**Table C 13.19.1: Brick data**

Description of brick		771-3-017	V and Vbl
Type of brick			Lightweight concrete solid block
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	2.0
Standard, approval			EN 771-3:2011, DIN V 18152-100:2005-10
Producer of brick			e.g. Bisophon Bisotherm GmbH Eisenbahnstraße 12 D-56218 Mühlheim-Kärlich
Format (measurement)		[mm]	$\geq 3DF (\geq 240 \times 175 \times 113)$
Minimum thickness of member	$h_{min} =$	[mm]	175

**Table C 13.19.2: 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	$d_{cut} \leq$	[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	$h_{nom} \geq$	[mm]	70	100
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	10.5	14.5
Minimum allowable edge distance	$c_{min} \geq$	[mm]	100	100

**Table C 13.19.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> 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
Lightweight concrete solid block V and Vbl, $f_b \geq 10 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	3.0	4.0
	Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	3.0
Lightweight concrete solid block V and Vbl, $f_b \geq 20 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	4.5	5.5
	Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	4.5
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	2.5	2.5

- 1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{min}$  according to Table B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C.
- 2) In absence of other national regulations
- 3) Maximum long term temperature
- 4) Maximum short term temperature

**Würth Plastic Anchor W-UR SymCon**

**Performances**

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

**Annex C 26**

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

**Table C 13.20.1: Brick data**

Description of brick	771-3-007	V and Vbl
Type of brick		Lightweight concrete solid brick
Bulk density	$\rho \geq$ [kg/dm <sup>3</sup> ]	1.0
Standard, approval		EN 771-3:2011, DIN V 18152-100:2005-10
Producer of brick		e.g. BasisBims, Bisotherm GmbH Eisenbahnstraße 12 D-56218 Mülheim-Kärlich
Format (measurement)	[mm]	$\geq$ NF ( $\geq 240 \times 115 \times 71$ )
Minimum thickness of member	$h_{\min} =$ [mm]	115

**Table C 13.20.2: 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]	60	110
Drill method	[-]	Hammer drilling	
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$ [mm]	50	100
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	10.5	14.5
Minimum allowable edge distance	$c_{\min} \geq$ [mm]	250	240

**Table C 13.20.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> 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]	50	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]	0.75	1.2
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	0.75	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]	1.5	2.5
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	1.5	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 B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

## Würth Plastic Anchor W-UR SymCon

### Performances

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

**Annex C 27**

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

**Table C 13.21.1: Brick data**

Description of brick		771-3-016	V and Vbl
Type of brick			Lightweight concrete solid brick
Bulk density	$\rho \geq$	[kg/dm <sup>3</sup> ]	1.0
Standard, approval			EN 771-3:2011, DIN V 18152-100:2005-10
Producer of brick			e.g. BisoBims, 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 C 13.21.2: 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]	100

**Table C 13.21.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size			W-UR 10 SymCon
Overall plastic anchor embedment depth	$h_{\text{nom}} \geq$	[mm]	70
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]	0.5
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.4
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]	0.9
Characteristic resistance $F_{Rk}$	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	0.75
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	2.5

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

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{\min}$  according to Table B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

### Würth Plastic Anchor W-UR SymCon

#### Performances

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

### Annex C 28

## Base material hollow brick lightweight concrete 3K Hbl

Table C 13.22.1: 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 <sup>3</sup> ]	0.7
Standard, approval		DIN V 18151-100:2005-10; EN 771-3:2011
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

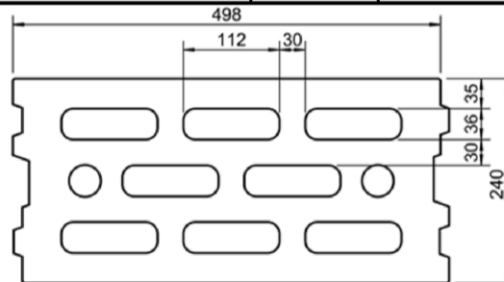


Table C 13.22.2: Installation parameters

Anchor size		W-UR 10 SymCon	W-UR 14 SymCon
Drill hole diameter	$d_0 =$ [mm]	10	14
Cutting diameter of drill bit	$d_{cut} \leq$ [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	$h_{nom} =$ [mm]	70	100
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	10.5	14.5
Minimum allowable edge distance	$c_{min} \geq$ [mm]	100	100

Table C 13.22.3: 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	$30^\circ C^{3)} / 50^\circ C^{4)}$ [kN]	0.6	0.6
3K Hbl, $f_b \geq 2 \text{ N/mm}^2$			
Characteristic resistance $F_{Rk}$	$50^\circ C^{3)} / 80^\circ C^{4)}$ [kN]	0.6	0.5
Hollow brick lightweight concrete	$30^\circ C^{3)} / 50^\circ C^{4)}$ [kN]	1.2	1.2
3K Hbl, $f_b \geq 4 \text{ N/mm}^2$			
Characteristic resistance $F_{Rk}$	$50^\circ C^{3)} / 80^\circ C^{4)}$ [kN]	1.2	0.9
Hollow brick lightweight concrete	$30^\circ C^{3)} / 50^\circ C^{4)}$ [kN]	1.2	1.5
3K Hbl, $f_b \geq 6 \text{ N/mm}^2$			
Characteristic resistance $F_{Rk}$	$50^\circ C^{3)} / 80^\circ C^{4)}$ [kN]	1.2	1.5
Partial safety factor	$\gamma_{Mm}^{2)}$ [-]	2.5	2.5

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

The characteristic resistance is valid for single plastic anchor or for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing  $s_{min}$  according to Table B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C.

2) In absence of other national regulations

3) Maximum long term temperature

4) Maximum short term temperature

## Würth Plastic Anchor W-UR SymCon

### Performances

Hollow brick lightweight concrete 3K Hbl  
Brick data, installation parameters, characteristic resistance

## Annex C 29



## Base material solid masonry: Autoclaved Aerated Concrete (AAC)

**Table C 13.23.1: Brick data**

Description of brick		AAC
Type of brick		Autoclaved Aerated Concrete
Bulk density	$\rho \geq$ [kg/dm <sup>3</sup> ]	0.3
Standard, approval		EN 771-4:2011
Format (measurement)	[mm]	$\geq 499 \times 100 \times 249$
Minimum thickness of member	$h_{\min} =$ [mm]	100

**Table C 13.23.2: 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 C 13.23.3: 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
<b>Autoclaved Aerated Concrete AAC</b> $f_b \geq 2 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$ [kN]	0.6
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	0.5
<b>Autoclaved Aerated Concrete AAC</b> $f_b \geq 3 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$ [kN]	0.9
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	0.7
<b>Autoclaved Aerated Concrete AAC</b> $f_b \geq 4 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$ [kN]	1.2
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	1.0
<b>Autoclaved Aerated Concrete AAC</b> $f_b \geq 5 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$ [kN]	1.5
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	1.2
<b>Autoclaved Aerated Concrete AAC</b> $f_b \geq 6 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$ [kN]	1.7
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [kN]	1.4
<b>Autoclaved Aerated Concrete AAC</b> $f_b \geq 7 \text{ N/mm}^2$	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$ [kN]	1.7
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$ [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 B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C.
- 2) In absence of other national regulations
- 3) Maximum long term temperature
- 4) Maximum short term temperature

## Würth Plastic Anchor W-UR SymCon

### Performances

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

**Annex C 30**

## Base material precast prestressed hollow core elements

Table C 13.24.1: Data

Description	Precast prestressed hollow core elements
Base material	Precast prestressed hollow core elements ≥ C30/37
Standard, approval	DIN EN 1168: 2011-12

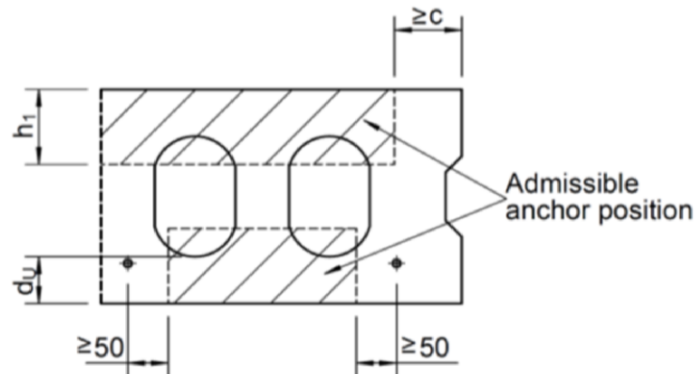


Table C 13.24.2: Installation parameters

Anchor size	W-UR 10 SymCon
Member thickness $d_u \geq$ [mm]	25 30 35 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]	$\geq 50 / \leq 70$
Diameter of clearance hole in the fixture $d_f \leq$ [mm]	10.5

Table C 13.24.3: Characteristic resistance  $F_{Rk}^{1)}$  in [kN] for single anchor

Anchor size	W-UR 10 SymCon
Member thickness $d_u \geq$ [mm]	25 30 35 40
Precast prestressed hollow core elements $\geq C30/37$	
Characteristic resistance $F_{Rk}$ $30^\circ C^{3)} / 50^\circ C^{4)}$ [kN]	1.0 2.0 3.0 4.0
Characteristic resistance $F_{Rk}$ $50^\circ C^{3)} / 80^\circ C^{4)}$ [kN]	1.0 2.0 3.0 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 B 3.1 (concrete). The specific conditions for the design method have to be considered according to ETAG 020 Annex C.
- 2) In absence of other national regulations
- 3) Maximum long term temperature
- 4) Maximum short term temperature

## Würth Plastic Anchor W-UR SymCon

### Performances

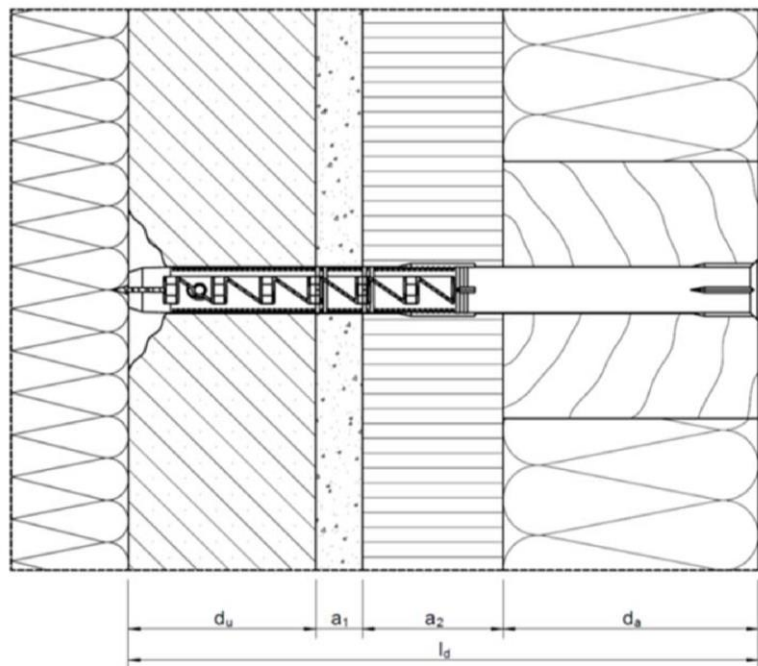
Precast prestressed hollow core elements  
Brick data, installation parameters, characteristic resistance

Annex C 31

**Base material thin concrete elements, weather resistant skins of external wall panels made of concrete**

**Table C 13.25.1: Data**

Description		Thin concrete elements, weather resistant skins of external wall panels made of concrete
Base material		Thin concrete elements, Weather resistant skins of external wall panels made of concrete $\geq$ C16/20



- $d_u$ : Thickness of weather resistant skin of external wall panel or thin concrete elements  
 $a_1$ : 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 C 13.25.2: Installation parameters**

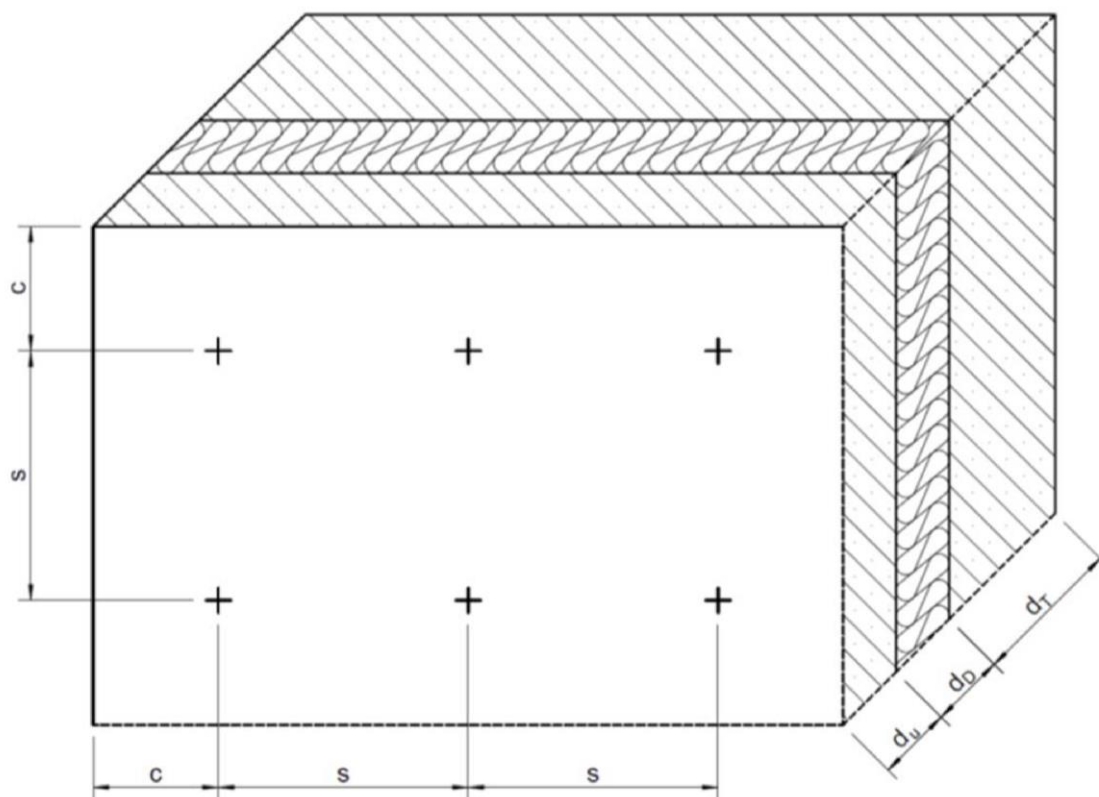
Anchor size			W-UR 10 SymCon
Member thickness	$d_u \geq$	[mm]	40
Drill hole diameter	$d_0$	[mm]	10
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	10.45
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	80
Drill method		[-]	Hammer drilling
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]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

**Würth Plastic Anchor W-UR SymCon**

**Performances**

Thin concrete elements, weather resistant skins of external wall panels made of concrete  
Brick data, installation parameters

**Annex C 32**



- $d_u$ : Thickness of weather resistant skin of external wall panel or thickness of the thin concrete element  
 $d_p$ : Thickness of insulation  
 $d_r$ : Thickness of member  
 $c$ : Edge distance  
 $s$ : Spacing

**Table C 13.25.3: Characteristic resistance  $F_{Rk}$ <sup>1)</sup> in [kN] for single anchor**

Anchor size			W-UR 10 SymCon
Member thickness	$d_u \geq$	[mm]	40
Thin concrete elements, weather resistant skins of external wall panels made of concrete	$30^\circ\text{C}^{3)} / 50^\circ\text{C}^{4)}$	[kN]	1.5
	$50^\circ\text{C}^{3)} / 80^\circ\text{C}^{4)}$	[kN]	1.2
$\geq \text{C16/20}$ , Characteristic resistance $F_{Rk}$			
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 B 4.1. The specific conditions for the design method have to be considered according to ETAG 020 Annex C.
- 2) In absence of other national regulations
- 3) Maximum long term temperature
- 4) Maximum short term temperature

#### Würth Plastic Anchor W-UR SymCon

#### Performances

Thin concrete elements, weather resistant skins of external wall panels made of concrete  
Characteristic resistance

**Annex C 33**