Einfach. Sicher.

DECLARATION OF PERFORMANCE

DoP: 0122
for Frame fixing URD (Plastic anchors for use in concrete and masonry) – **EN**

1. Unique identification code of the product-type: **DoP: 0122**

2. Intended use/es: **For use in systems, such as façade systems, for fixing or supporting elements which contribute to the stability of the systems, see appendix, especially Annexes B 1 to B 4**

3. Manufacturer: **Upat Vertriebs GmbH, Bebelstraße 11, 79108 Freiburg im Breisgau, Germany**

4. Authorised representative: **--**

5. System/s of AVCP: **2+**

6. European Assessment Document: **ETAG 020, 2012-03**

   European Technical Assessment: **ETA-17/0811; 2017-12-14**

   Technical Assessment Body: **DIBt**

   Notified body/ies: **1343 – MPA Darmstadt**

7. Declared performance/s:

Mechanical resistance and stability (BWR 1), Safety and accessibility (BWR 4)

- **Characteristic resistance for tension and shear loads: See appendix, especially Annexes C 1, C 3 to C 14**
- **Characteristic resistance for bending moments: See appendix, especially Annex C 1**
- **Displacements under shear and tension loads: See appendix, especially Annex C 2**
- **Anchor distances and dimensions of members: See appendix, especially Annexes B 2 to B 3**

Safety in case of fire (BWR 2)

- **Reaction to fire: Anchorages satisfy requirements for Class A 1**
- **Resistance to fire: See appendix, especially Annex C 2**

8. Appropriate Technical Documentation and/or Specific Technical Documentation: ---

The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of the manufacturer by:

Andreas Bucher, Dipl.-Ing.

Wolfgang Hengesbach, Dipl.-Ing., Dipl.-Wirtsch.-Ing.

i.V. A. Bucher

i.V. W. Hengesbach

Tumlingen, 2017-12-20

- This DoP has been prepared in different languages. In case there is a dispute on the interpretation the english version shall always prevail.
- The Appendix includes voluntary and complementary information in English language exceeding the (language-neutrally specified) legal requirements.

Specific Part

1 Technical description of the product

The frame fixing in the range URD 8 and URD 10 is a plastic anchor consisting of a plastic sleeve made of polyamide and an accompanying specific screw of galvanised steel, of galvanised steel with an additional Duplex-coating 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	Anchorages satisfy requirements for Class A 1
Resistance to fire	See Annex C 2

3.3 Safety and accessibility (BWR 4)

Essential characteristic	Performance
Characteristic resistance for tension and shear loads	See Annexes C 1, C 3 – C 14
Characteristic resistance for bending moments	See Annex C 1
Displacements under shear and tension loads	See Annex C 2
Anchor distances and dimensions of members	See Annex B 2, B 3

3.4 General aspects

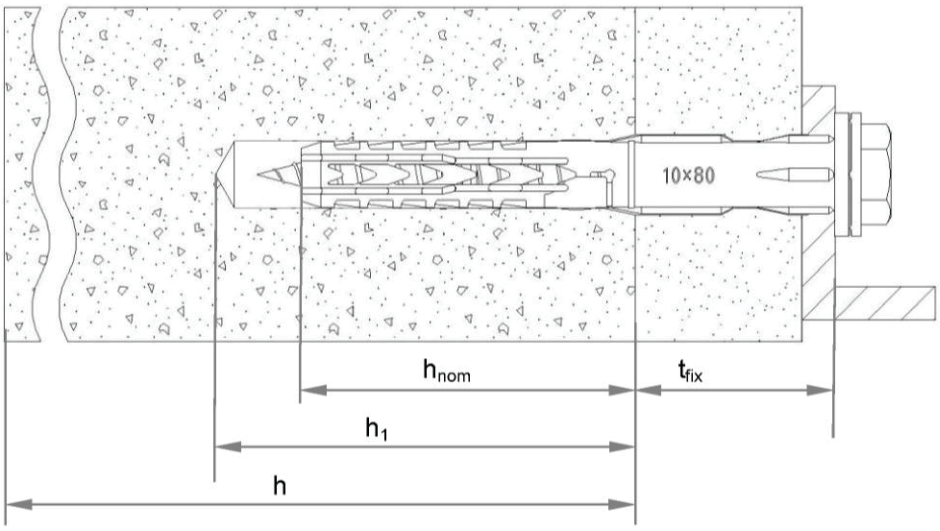
The verification of durability is part of testing the essential characteristics. Durability is only ensured if the specifications of intended use according to Annex B are taken into account.

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+

URD



Legend

h_{nom} = overall plastic anchor embedment depth in the base material

h_1 = depth of drill hole to deepest point

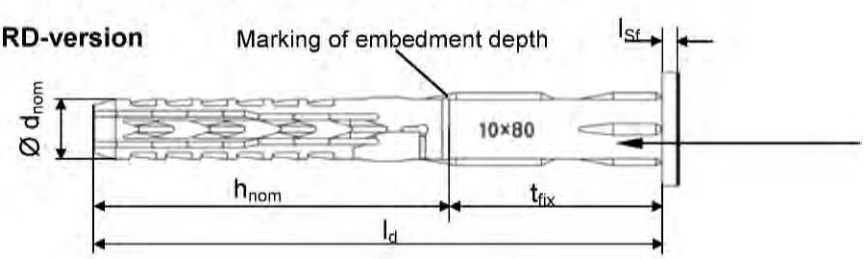
h = thickness of member (wall)

t_{fix} = thickness of fixture and / or non-load bearing layer

frame fixing URD	**Annex A 1**
Product description Installed anchor	

Anchor sleeves – flat collar version of URD

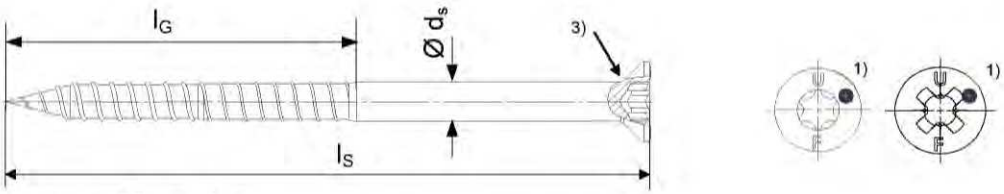
URD-version



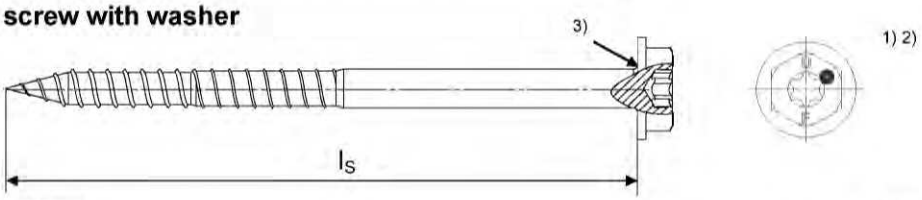
Marking:
Brand
Anchor type
Size
e.g. URD 10x80

Countersunk sleeve version also available

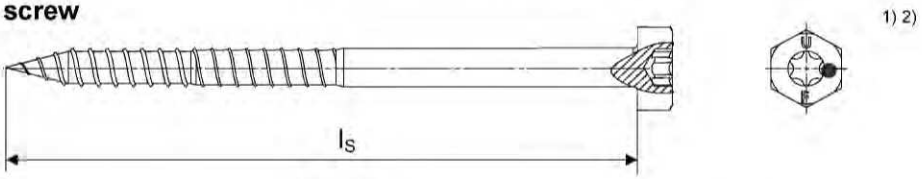
Countersunk screws



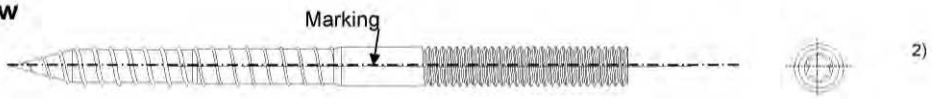
Hexagonal screw with washer



Hexagonal screw



Stud screw



1) Additional marking for the special screw, stainless steel version: „A4".
2) Internal driving feature for Torx bit is optional for hexagonal head and for stud screw
3) Optional additional version with underhead ribs

frame fixing URD	
Product description Anchor types / special screws	**Annex A 2**

Table A3.1: Dimensions [mm]

Anchor type	Anchor sleeve							Special screw		
	h_{nom} [mm]	Ø d_{nom} [mm]	t_{fix} [mm]	min. l_d [mm]	max. l_d [mm]	l_{Sf} [1)] [mm]	Ø d_{Sf} [mm]	Ø d_s [mm]	l_G [mm]	l_s [mm]
URD 8	**50**	**8**	**≥ 1**	**51**	**360**	**1,8**	**> 15,0**	**6,0**	**≥ 55**	**≥ l_d + 6**
URD 10	**50**	**10**	**≥ 1**	**51**	**360**	**2,2**	**> 18,5**	**7,0**	**≥ 57**	**≥ l_d + 7**

1) Only valid for flat collar version

Table A3.2: Materials

Name	Material
Anchor sleeve	Polyamide, PA6, colours: grey, off-white
Special screw	- Steel gvz A2G or A2F acc. to EN ISO 4042:1999 **or** - Steel gvz A2G or A2F acc. to EN ISO 4042:1999 + Duplex-coating type Delta-Seal in three layers (total layer thickness ≥ 6 µm) **or** - Stainless steel acc. to EN 10 088-3:2014, e.g. 1.4401, 1.4571, 1.4578, 1.4362

Specifications of intended use

Anchorages subject to:
- Static and quasi-static loads.
- Multiple fixing of non-structural applications.

Base materials:
- Reinforced or unreinforced normal weight concrete with strength classes ≥ C12/15 (use category “a”), according to EN 206-1:2000, Annex C1, C 2.
- Solid brick masonry (use category “b”), according to Annex C 3 – C 5.
  Note: The characteristic resistance is also valid for larger brick sizes and higher compressive strength of the masonry unit.
- Hollow brick masonry (use category “c”), according to Annex C 6 – C 13.
- Autoclaved aerated concrete (use category “d”), according to Annex C 14.
- Mortar strength class of the masonry ≥ M2,5 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:
URD 8 and 10
- c: - 40 °C to 50 °C (max. short term temperature + 50 °C and max long term temperature + 30 °C)
- b: - 40 °C to 80 °C (max. short term temperature + 80 °C and max long term temperature + 50 °C)

Use conditions (Environmental conditions):
- Structures subject to dry internal conditions (zinc coated steel, stainless steel).
- The specific screw made of galvanised steel or galvanised steel with an additional Duplex-coating 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 to be designed in accordance with the ETAG 020, Annex C under the responsibility of an engineer experienced in anchorages and masonry work.
- 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 drilling method according to Annex C1, C 3 – C 14 for use categories “b”, “c” and “d”.
- 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 URD 8 and URD 10: - 5 °C to + 40 °C
- Exposure to UV due to solar radiation of the not protected anchor ≤ 6 weeks.

frame fixing URD	**Annex B 1**
Intended use Specifications	

Table B2.1: Installation parameters

Anchor type				URD 8	URD 10
Drill hole diameter	d_0	=	[mm]	8	10
Cutting diameter of drill bit	d_{cut}	≤	[mm]	8,45	10,45
Overall plastic anchor embedment depth in the base material [1]	h_{nom}	≥	[mm]	50	50
Depth of drill hole to deepest point [1]	h_1	≥	[mm]	60	60
Diameter of clearance hole in the fixture	d_f	≤	[mm]	8,5	10,5/12,5[2]

1) For hollow and perforated masonry: If the embedment depth is higher than h_{nom} given in the Table B2.1, job site tests have to be carried out according to ETAG 020, Annex B.

2) See Table C2.1.

Table B2.2: Assignment of h_{nom}, l_d and t_{fix} for use in thin concrete slabs (e.g. weather resistant shells of external wall panels)

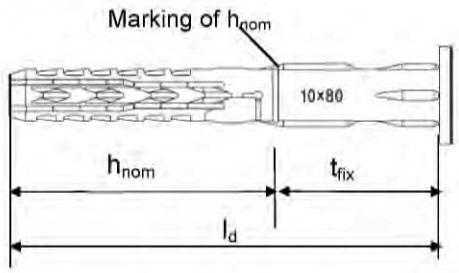
Anchor type	URD 10		
Use category "a"	h_{nom} ≥ 50 mm		
	l_d	$t_{fix,\ min}$	$t_{fix,\ max}$
	52	1	2
	60	1	10
	80	21	30
	100	41	50
	120	61	70
	140	81	90
	160	101	110
	180	121	130
	200	141	150
	230	171	180
	260	201	210
	[mm]		

Table B2.3: Minimum thickness of member, edge distance and spacing in concrete

Anchor Type	h_{nom} ≥ [mm]	Concrete Strength class	Min. thickness of member h_{min} [mm]	Characteristic edge distance $c_{cr,N}$ [mm]	Characteristic spacing $s_{cr,N}$ [mm]	Min. spacing and edge distances [1] [mm]
URD 8	50	≥ C16/20	100	60	70	s_{min} = 70 for c ≥ 60 c_{min} = 60 for s ≥ 70
		C12/15		85	100	s_{min} = 100 for c ≥ 85 c_{min} = 85 for s ≥ 100
URD 10	50	≥ C16/20	100[2]	100	90	s_{min} = 50 for c ≥ 150 c_{min} = 60 for s ≥ 70
		C12/15		140	100	s_{min} = 70 for c ≥ 210 c_{min} = 85 for s ≥ 100

1) Intermediate values by linear interpolation.

2) Also valid for thin concrete slabs h ≥ 40 mm, h_{nom} = 50 mm to 59 mm

Fixing points with a spacing a ≤ $s_{cr,N}$ are considered as a group with a max. characteristic resistance $N_{Rk,p}$ acc. to Table C1.3. For a spacing a > $s_{cr,N}$ the anchors are considered as single anchors, each with a characteristic resistance $N_{Rk,p}$ acc. to Table C1.3.

frame fixing URD

Annex B 2

Intended use
Installation parameters, parameters for use in thin e.g. weather resistant concrete skins
Member thickness, distance and spacing in concrete

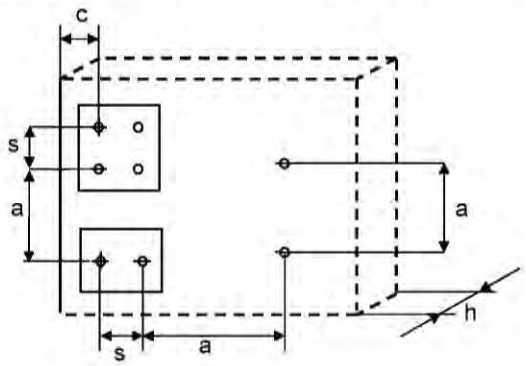
Table B3.1: Minimum thickness of member, edge distance and spacing in masonry

Anchor type			**URD 8**	**URD 10**
Minimum thickness of member	h_{min}	[mm]	100	100
Single anchor				
Minimum spacing	a_{min}	[mm]	250	250
Minimum edge distance	c_{min}	[mm]	100	100
Anchor group				
Minimum spacing perpendicular to free edge	$s_{1,min}$	[mm]	100	100
Minimum spacing parallel to free edge	$s_{2,min}$	[mm]	100	100
Minimum edge distance	c_{min}	[mm]	100	100
Distance between anchor groups and / or single anchors	a	[mm]	250	

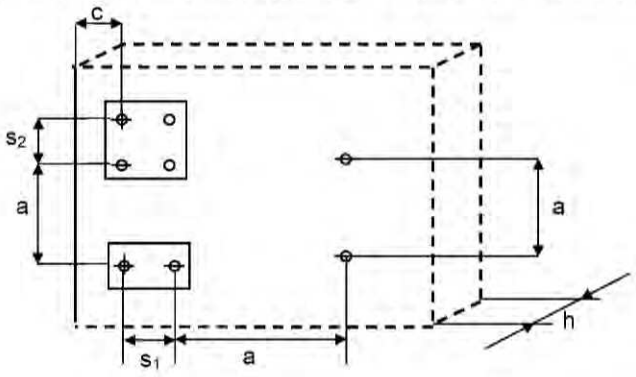
Table B3.2: Minimum thickness of member, edge distance, spacing in autoclaved aerated concrete (AAC)

Anchor type			**URD 10**
Compressive strength	f_b	[N/mm²]	≥ 2
Nominal embedment depth	$h_{nom} \geq$	[mm]	50
Minimum thickness of member	h_{min}	[mm]	100
Single anchor			
Minimum spacing	a_{min}	[mm]	250
Minimum edge distance	c_{min}	[mm]	100
Anchor group			
Minimum spacing perpendicular to free edge	$s_{1,min}$	[mm]	200
Minimum spacing parallel to free edge	$s_{2,min}$	[mm]	400
Minimum edge distance	c_{min}	[mm]	100
Distance between anchor groups and / or single anchors	a	[mm]	400

Scheme of distance and spacing in concrete



Scheme of distance and spacing in masonry and in AAC

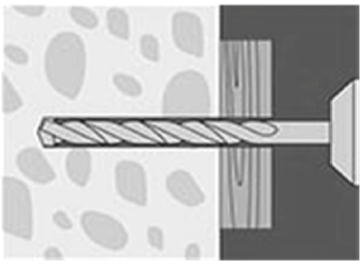


frame fixing URD

Intended use
Member thickness, distance and spacing in masonry and autoclaved aerated concrete (AAC), schemes of distance and spacing in concrete and in masonry / AAC

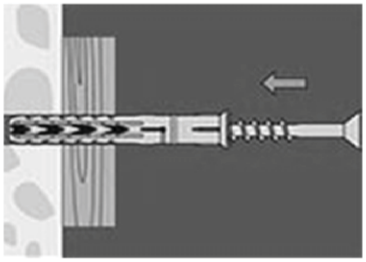
Annex B 3

Installation instructions (the following pictures show fixing through timber)

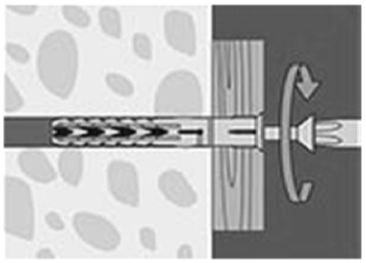


1. Drill the bore hole acc. to Table B2.1 using the drill method described in the corresponding Annex C.

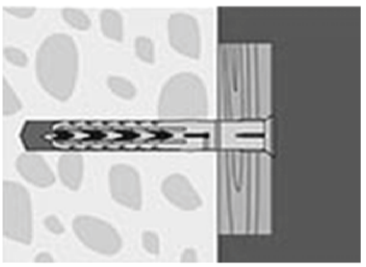
2. Use category „a“ concrete, „b“ solid masonry, „d” autoclaved aerated concrete: Remove dust from borehole.



3. Insert anchor (screw and plug) by using a hammer until the collar of the plastic sleeve is flush with the surface of the fixture.



4. The screw is screwed-in until the head of the screw touches the sleeve. The anchor is correctly mounted, when the head of the screw fits tight on the surface and cannot be screwed-in any further.



5. Correctly installed anchor in e.g. concrete.

frame fixing URD	**Annex B 4**
Intended use Installation instructions	

Table C1.1: Characteristic bending resistance of the screw

Anchor type	URD 8		URD 10	
Material	galvanised steel	stainless steel	galvanised steel	stainless steel
Characteristic bending resistance $M_{Rk,s}$ [Nm]	**12,4**	**12,0**	**20,6**	**20,6**
Partial safety factor γ_{Ms} [1)]	**1,25**	**1,29**	**1,29**	**1,29**

1) In absence of other national regulations.

Table C1.2: Characteristic resistance of the screw

Failure of expansion element (special screw)			URD 8		URD 10	
			galvanised steel	stainless steel	galvanised steel	stainless steel
Characteristic tension resistance	$N_{Rk,s}$	[kN]	**14,8**	**14,3**	**21,7**	**21,7**
Partial safety factor	γ_{Ms} [1)]		**1,50**	**1,45**	**1,55**	**1,55**
Characteristic shear resistance	$V_{Rk,s}$	[kN]	**7,4**	**7,1**	**10,8**	**10,8**
Partial safety factor	γ_{Ms} [1)]		**1,25**	**1,29**	**1,29**	**1,29**

1) In absence of other national regulations.

Table C1.3: Characteristic resistance for use in concrete (use cat. "a")
Drill method in concrete: Hammerdrilling

Pull-out failure (plastic sleeve)				URD 8	URD 10
Embedment depth h_{nom} [mm]				50	50
Concrete ≥ C12/15					
Characteristic resistance 30/50 °C	$N_{Rk,p}$	[kN]		**3,0**	**5,0**
Characteristic resistance 50/80 °C	$N_{Rk,p}$	[kN]		**2,5** **3,0** [2)]	**4,5**
Concrete ≥ C12/15 (e.g. weather resistant shells of external wall panels)					
Characteristic resistance 30/50 °C	N_{Rk}	[kN]	**h ≥ 40 mm**	-	**3,5**
Characteristic resistance 50/80 °C	N_{Rk}	[kN]	**h ≥ 40 mm**	-	**3,0**
Partial safety factor	γ_{Mc} [1)]			**1,8**	

1) In absence of other national regulations.
2) Value corresponds to concrete class ≥ C16/20.

frame fixing URD	**Annex C 1**
Performances Characteristic resistance and characteristic bending resistance of the screw Characteristic resistance for use in concrete	

Table C2.1: Displacements[1] under tension and shear loading in concrete and masonry

			Tension load [2]		Shear load [2]	
Anchor type	h_{nom} [mm]	F [kN]	δ_{NO} [mm]	$\delta_{N\infty}$ [mm]	δ_{VO} [mm]	$\delta_{V\infty}$ [mm]
URD 8	**50**	1,2	0,65	1,30	1,02	1,53
URD 10	**50**	2,0	1,29	2,58	1,15/3,05[3]	1,74/4,58[3]

1) Valid for all ranges of temperatures.
2) Intermediate values by linear interpolation.
3) Valid for diameter in the clearance hole ≤ 12,5 mm (see Table B2.1).

Table C2.2: Displacements[1] under tension und shear loading in autoclaved aerated concrete

				Tension load [2]		Shear load [2]	
Anchor type	f_b [N/mm²]	h_{nom} [mm]	F [kN]	δ_{NO} [mm]	$\delta_{N\infty}$ [mm]	δ_{VO} [mm]	$\delta_{V\infty}$ [mm]
URD 10	**≥ 2**	**50**	0,32	0,03	0,06	0,21	0,31

1) Valid for all ranges of temperatures.
2) Intermediate values by linear interpolation.

Table C2.3: 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 façade systems

Anchor type	Fire resistance class	F[1]
URD 10	**R 90**	≤ 0,8 kN

1) $F_{Rk} / (\gamma_m \times \gamma_F)$

Table C3.1: Characteristic resistance F_{Rk} in [kN] in solid masonry (use category "b")

Base material [*Supplier Title*] Geometry, DF or nom. size (L x W x H) [mm] and drilling method	Min. compressive strength f_b [N/mm²] / bulk density ρ [kg/dm³]	Characteristic resistance F_{Rk} [kN] 50/80°C	
		URD 8	URD 10
		$h_{nom} \geq 50$ mm	
Clay brick Mz, acc. to EN 771-1:2011 *e.g. Schlagmann* **3 DF** (240x175x113) by hammer drilling	20/1,8	**3,0**	**2,0** **4,0**[4)] **4,5**[6)]
	10/1,8	**2,0**	**1,5** **3,0**[4)]
Clay brick Mz, acc. to EN 771-1:2011 *e.g. Schlagmann* *e.g. Ebersdobler* **NF** (240x115x71) by hammer drilling	36/1,8	**2,5**	**5,0**
	20/1,8	**2,5**	**3,0** **3,5**[2)]
	12/1,8	**2,0**	**2,0**
	10/1,8	**2,0**	**2,0**
Clay brick Mz, acc. to EN 771-1:2011 *e.g. Wienerberger, DK* **DF** (240x115x52) by hammer drilling	28/1,8	**3,0**	**3,0**
	20/1,8	**2,0**	**2,0**
	16/1,8	**1,5**	**1,5**
	12/1,8	**1,5**	**1,2**
	10/1,8	**1,5**	**1,2**
Partial safety factor	γ_{Mm}[1)]	**2,5**	

1) In absence of other national regulations.
2) Only valid for temperature range 30/50° C.
4) Only valid for edge distance c ≥ 200 mm; intermediate values by linear interpolation.
6) Only valid for edge distance c ≥ 200 mm for temperature range 30/50° C; intermediate values by linear interpolation.

Table C4.1: Characteristic resistance F_{Rk} in [kN] in solid masonry (use category "b")

Base material [*Supplier Title*] Geometry, DF or nom. size (L x W x H) [mm] and drilling method	Min. compressive strength f_b [N/mm²] / bulk density ρ [kg/dm³]	Characteristic resistance F_{Rk} [kN] 50/80°C	
		URD 8	URD 10
		$h_{nom} \geq 50$ mm	
Calcium silicate solid brick KS, acc. to EN 771-2:2011 *e.g. KS Wemding* **NF** (240x115x71) by hammer drilling	36/2,0	-	**5,0**
	20/2,0	-	**3,0** **3,5**[2]
	20/1,8	**2,5**	**2,5** **4,0**[4]
	10/2,0	-	**2,0**
	10/1,8	**2,0**	**1,5**
Calcium silicate solid brick KS, acc. to EN 771-2:2011 *e.g. KS Wemding* **12 DF** (495x175x240) by hammer drilling	28/2,0	**3,0**	**5,0**
	20/2,0	**3,0**	**4,5**
	10/2,0	**2,5**	**3,0**
Lightweight solid brick Vbl, acc. to EN 771-3:2011 *e.g. KLB* **2 DF** (240x115x113) by hammer drilling	4/1,4	-	**0,75**
	2/1,4	-	**0,4**
	2/1,2	**0,9**	**0,75** **0,9**[3]
Lightweight solid brick Vbl, acc. to EN 771-3:2011 *e.g. KLB* **8 DF** (490x240x115) by hammer drilling	12/1,8	**2,5**	-
	10/1,8	**2,5**	-
	8/1,8	**2,5**	-
	8/1,6	-	**3,0**
	6/1,8	**2,0**	-
	6/1,6	-	**2,0**
	4/1,8	**1,2**	-
	2/1,2	-	**1,2**
	2/1,0	**1,2**	-
Partial safety factor	γ_{Mm}[1]	**2,5**	

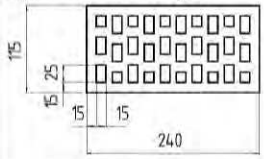
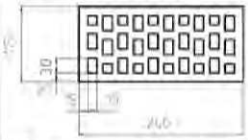
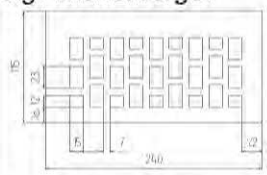
1) In absence of other national regulations.
2) Only valid for temperature range 30/50° C.
3) Only valid for edge distance c ≥ 150 mm; intermediate values by linear interpolation.
4) Only valid for edge distance c ≥ 200 mm; intermediate values by linear interpolation.

Table C5.1: Characteristic resistance F_{Rk} in [kN] in solid masonry (use category "b")

Base material [*Supplier Title*] Geometry, DF or nom. size (L x W x H) [mm] and drilling method	Min. compressive strength f_b [N/mm²] / bulk density ρ [kg/dm³]	Characteristic resistance F_{Rk} [kN] 50/80°C	
		URD 8	URD 10
		$h_{nom} \geq 50$ mm	
Lightweight solid brick Vbl, acc. to EN 771-3:2011 *e.g. KLB* **8 DF** (245x240x240) by hammer drilling	10/1,6	-	**2,5**
	8/1,6	-	**2,5**
	6/1,6	-	**2,5**
	6/1,4	**0,9**	-
	4/1,6	-	**0,9**
	4/1,4	**0,6** **0,75**[2)]	-
	2/1,6	-	**0,5**
Lightweight solid brick Vbl, acc. to EN 771-3:2011, *e.g. Tarmac* (440x100x215) by hammer drilling	6/1,4	-	**2,0** **2,5**[4)]
	4/1,4	-	**1,2** **1,5**[4)]
Solid brick normal concrete Vbn, acc. to EN 771-3:2011 *e.g. Adolf Blatt* (240x245x240) by hammer drilling	20/1,8	**2,5**	**4,5**
	16/1,8	**2,5**	**3,5**
	12/1,8	**2,5**	**3,0**
	10/1,8	**1,5**	**3,0**
	8/1,8	**1,5**	-
	4/1,8	**0,75**	-
Solid brick normal concrete Vbn, acc. to EN 771-3:2011 *e.g.Tarmac GB* (440x100x215) by hammer drilling	16/1,8	-	**4,0** **4,5**[2)]
	10/1,8	-	**2,5** **3,0**[2)]
Partial safety factor	γ_{Mm}[1)]	**2,5**	

1) In absence of other national regulations.
2) Only valid for temperature range 30/50° C.
4) Only valid for edge distance c ≥ 200 mm; intermediate values by linear interpolation.

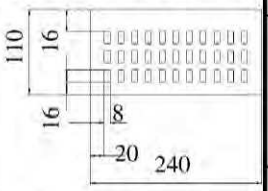
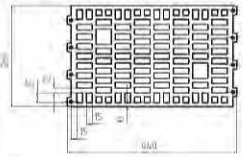
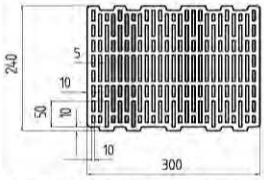
Table C6.1: Characteristic resistance F_{Rk} in [kN] in hollow or perforated masonry (use category "c")

Base material [*Supplier Title*] Geometry, DF or nom. size (L x W x H) [mm] and drilling method	Min. compressive strength f_b [N/mm²] / bulk density ρ [kg/dm³]	Characteristic resistance F_{Rk} [kN] 50/80°C	
		URD 8	URD 10
		h_{nom} 50 mm	
Perforated clay brick HLz Form B, acc. to EN 771-1:2011 *e.g. Wienerberger*  **2 DF** (240x115x113) by rotary drilling	20/1,2	**1,2**	**2,5** **3,0**[5]
	20/1,0	**-**	**2,0**
	10/1,2	**0,6**	**1,5** **2,0**[2]
	10/1,0	**-**	**1,2**
	8/1,2	**0,5**	**-**
Perforated clay brick HLz acc. to EN 771-1:2011 *e.g. Wienerberger*  **2 DF** (240x115x113) by rotary drilling	12/1,0	**0,6**	**0,9**
	10/1,0	**-**	**0,75**
	8/1,0	**0,4**	**0,6**
Perforated clay brick VHLz acc. to EN 771-1:2011, *e.g. Wienerberger*  **2 DF** (240x115x113) by rotary drilling	48/1,6	**-**	**2,5**
	36/1,6	**-**	**2,0**
	28/1,6	**-**	**1,5**
	20/1,6	**-**	**0,9**
	12/1,6	**-**	**0,6**
Partial safety factor	γ_{Mm}[1]	**2,5**	

1) In absence of other national regulations.
2) Only valid for temperature range 30/50° C.
5) Only valid for edge distance c ≥ 150 mm at temperature range 30/50° C; intermediate values by linear interpolation.

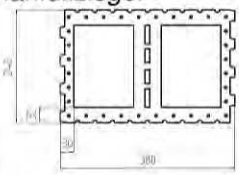
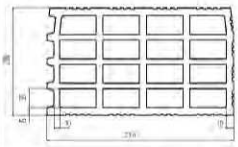
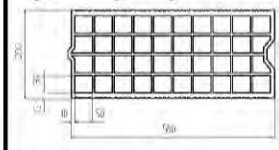
frame fixing URD	**Annex C 6**
Performances Characteristic resistance for use in solid masonry and in hollow or perforated masonry	

Table C7.1: Characteristic resistance F_{Rk} in [kN] in hollow or perforated masonry (use category "c")

Base material [*Supplier Title*] Geometry, DF or nom. size (L x W x H) [mm] and drilling method	Min. compressive strength f_b [N/mm²] / bulk density ρ [kg/dm³]	Characteristic resistance F_{Rk} [kN] 50/80°C	
		URD 8	URD 10
		h_{nom} 50 mm	
Perforated clay brick HLz acc. to EN 771 -1:2011+A1:2014, *e.g. Wienerberger, BS*  **DF**(240x110x52) by hammer drilling	28/1,5	**2,5**	**2,5**
	20/1,5	**1,2** **1,5**[2)]	**2,0**
	10/1,5	**0,6** **0,9**[2)]	**1,2**
Perforated clay brick HLz Form B, acc. to EN 771-1:2011 *e.g. Schlagmann*  **10 DF** (260x240x440) by rotary drilling	8/0,9	**0,9**	-
	6/0,9	**0,6**	-
	4/0,9	**0,4**	-
Perforated clay brick HLz acc. to EN 771-1:2011 *e.g. Schlagmann Poroton T14*  **10 DF** (300x240x240) by rotary drilling	6/0,7	-	**0,3** **0,4**[2)]
Partial safety factor	γ_{Mm}[1)]	**2,5**	

1) In absence of other national regulations.
2) Only valid for temperature range 30/50° C.

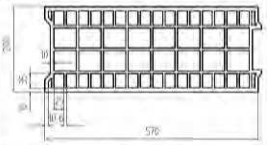
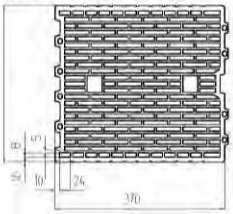
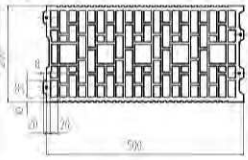
Table C8.1: Characteristic resistance F_{Rk} in [kN] in hollow or perforated masonry (use category "c")

Base material [*Supplier Title*] Geometry, DF or nom. size (L x W x H) [mm] and drilling method	Min. compressive strength f_b [N/mm²] / bulk density ρ [kg/dm³]	Characteristic resistance F_{Rk} [kN] 50/80°C	
		URD 8	URD 10
		h_{nom} 50 mm	
Perforated clay brick HLz Form B, acc. to EN 771-1:2011, *e.g. Schlagmann Planfüllziegel*  **12 DF** (380x240x240) by rotary drilling	6/0,7	**1,2**	**2,0**
	4/0,7	**0,75**	-
	2/0,7	**0,4**	-
Perforated clay brick HLz acc. to EN 771-1:2011, *e.g. Imerys Gelimatic*  (500x200x270) by rotary drilling	6/0,6	-	**0,6** **0,75**[6)]
Perforated clay brick HLz acc. to EN 771-1:2011, *e.g. Imerys Optibric*  (560x200x275) by rotary drilling	10/0,6	-	**1,2**
Partial safety factor	γ_{Mm} [1)]	**2,5**	

1) In absence of other national regulations.

6) Only valid for edge distance c ≥ 200 mm at temperature range 30/50° C; intermediate values by linear interpolation.

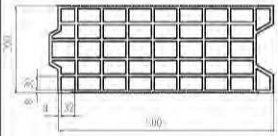
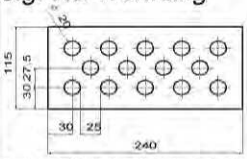
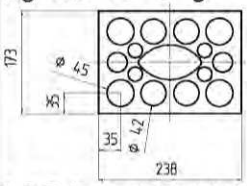
Table C9.1: Characteristic resistance F_{Rk} in [kN] in hollow or perforated masonry (use category "c")

Base material [*Supplier Title*] Geometry, DF or nom. size (L x W x H) [mm] and drilling method	Min. compressive strength f_b [N/mm²] / bulk density ρ [kg/dm³]	Characteristic resistance F_{Rk} [kN] 50/80°C	
		URD 8	URD 10
		h_{nom} 50 mm	
Perforated clay brick HLz acc. to EN 771-1:2011, *e.g. Bouyer Leroux BGV* (570x200x315)  by rotary drilling	6/0,6	-	**0,75** **0,9**[3)] **1,2**[5)]
Perforated clay brick HLz acc. to EN 771-1:2011, *e.g. Wienerberger Porotherm 30 R*  (370x300x250) by rotary drilling	10/0,7	-	**0,5** **0,6**[3)]
Perforated clay brick HLz acc. to EN 771-1:2011, *e.g. Wienerberger Porotherm GF R20*  (560x200x275) by rotary drilling	10/0,7	-	**0,6** **0,75**[3)]
Partial safety factor	γ_{Mm} [1)]	**2,5**	

1) In absence of other national regulations.
3) Only valid for edge distance c ≥ 150 mm; intermediate values by linear interpolation.
5) Only valid for edge distance c ≥ 150 mm for temperature range 30/50° C; intermediate values by linear interpolation.

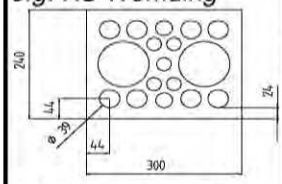
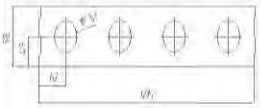
frame fixing URD	**Annex C 9**
Performances Characteristic resistance for use in hollow or perforated masonry	

Table C10.1: Characteristic resistance F_{Rk} in [kN] in hollow or perforated masonry (use category "c")

Base material [*Supplier Title*] Geometry, DF or nom. size (L x W x H) [mm] and drilling method	Min. compressive strength f_b [N/mm²] / bulk density ρ [kg/dm³]	Characteristic resistance F_{Rk} [kN] 50/80°C	
		URD 8	URD 10
		h_{nom} 50 mm	
Perforated clay brick HLz acc. to EN 771-1:2011, *e.g. Terreal Calibric*  (500x200x220) by rotary drilling	8/0,7	-	**0,6** **0,75**[6)]
Hollow calcium silicate brick *KSL* acc. to EN 771-2:2011 *e.g. KS Wemding*  **2 DF** (240x115x113) by hammer drilling	12/1,4	**2,0**	**2,0** **2,5**[2)]
	10/1,4	**1,5**	**2,0**
	8/1,4	**1,2**	**1,5**
	6/1,4	**0,9**	-
Hollow calcium silicate brick KSL acc. to EN 771-2:2011 *e.g. KS Wemding*  **3 DF** (240x175x113) by hammer drilling	20/1,4	**1,2** **1,5**[2)]	-
	16/1,4	**0,9** **1,2**[2)]	-
	12/1,4	**0,75** **0,9**[2)]	-
	10/1,4	**0,6** **0,75**[2)]	-
	8/1,4	**0,5** **0,6**[2)]	-
Partial safety factor	γ_{Mm}[1)]	**2,5**	

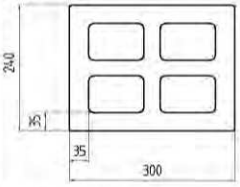
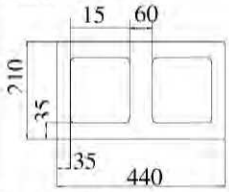
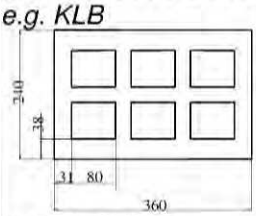
1) In absence of other national regulations.
2) Only valid for temperature range 30/50° C.
6) Only valid for edge distance c ≥ 200 mm for temperature range 30/50° C; intermediate values by linear interpolation.

Table C11.1: Characteristic resistance F_{Rk} in [kN] in hollow or perforated masonry (use category "c")

Base material [*Supplier Title*] Geometry, DF or nom. size (L x W x H) [mm] and drilling method	Min. compressive strength f_b [N/mm²] / bulk density ρ [kg/dm³]	Characteristic resistance F_{Rk} [kN] 50/80°C	
		URD 8	URD 10
		h_{nom} 50 mm	
Hollow calcium silicate brick KSL acc. to EN 771-2:2011 *e.g. KS Wemding*  **5 DF** (300x240x113) by hammer drilling	16/1,4	**2,0**	**3,0** **3,5**[5]
	12/1,4	**1,5**	-
	10/1,4	**1,2**	**1,5**
	8/1,4	**0,9**	-
	6/1,4	**0,75** **0,9**[2]	-
Hollow calcium silicate brick KSL acc. to EN 771-2:2011 *e.g. KS Wemding, P10*  (495x98x245) by hammer drilling	6/1,2	**1,2** **1,5**[2]	**1,5** **2,0**[3] **2,5**[5]
	4/1,2	**0,75** **0,9**[2]	-
	2/1,2	**0,4** **0,5**[2]	-
Partial safety factor	γ_{Mm}[1]	**2,5**	

1) In absence of other national regulations.
2) Only valid for temperature range 30/50° C.
3) Only valid for edge distance c ≥ 150 mm; intermediate values by linear interpolation.
5) Only valid for edge distance c ≥ 150 mm for temperature range 30/50° C; intermediate values by linear interpolation.

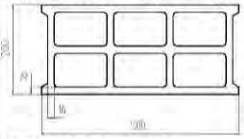
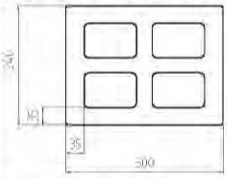
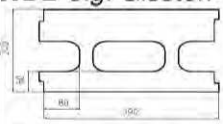
Table C12.1: Characteristic resistance F_{Rk} in [kN] in hollow or perforated masonry (use category "c")

Base material [*Supplier Title*] Geometry, DF or nom. size (L x W x H) [mm] and drilling method	Min. compressive strength f_b [N/mm²] / bulk density ρ [kg/dm³]	Characteristic resistance F_{Rk} [kN] 50/80°C	
		URD 8	URD 10
		h_{nom} 50 mm	
Hollow brick light-weight concrete Hbl acc. to EN 771-3:2011, *e.g. KLB*  (300x240x240) by hammer drilling	2/1,2	-	**1,5**
Hollow brick light-weight concrete Hbl acc. to EN 771-3:2011, *e.g. Roadstone masonry*  (440x210x215) by hammer drilling	10/1,2	**2,5**	-
	8/1,2	**2,0**	**2,5**
	6/1,2	**1,5**	**2,0**
Hollow brick light-weight concrete Hbl acc. to EN 771-3:2011, *e.g. KLB*  (360x240x240) by hammer drilling	6/1,0	**1,5**	-
Partial safety factor	γ_{Mm} [1)]	**2,5**	

1) In absence of other national regulations.

frame fixing URD	**Annex C 12**
Performances Characteristic resistance for use in hollow or perforated masonry	

Table C13.1: Characteristic resistance F_{Rk} in [kN] in hollow or perforated masonry (use category "c")

Base material [*Supplier Title*] Geometry, DF or nom. size (L x W x H) [mm] and drilling method	Min. compressive strength f_b [N/mm²] / bulk density ρ [kg/dm³]	Characteristic resistance F_{Rk} [kN] 50/80°C	
		URD 8	URD 10
		h_{nom} 50 mm	
Hollow brick light-weight concrete Hbl acc. to EN 771-3:2011, *e.g. Sepa Parpaing*  (500x200x200) by rotary drilling	4/0,9	**0,3** **0,4**[2]	**0,9** **1,2**[4] **1,5**[6]
Hollow brick normal concrete Hbn acc. to EN 771-3:2011,  *e.g. Adolf Blatt* (300x240x240) by hammer drilling	6/1,6	-	**2,5**
	4/1,6	-	**1,5**
	2/1,6	-	**0,75**
Heat insulation brick WDB *e.g. Gisoton*  (390x240x240) by hammer drilling	2/0,7	-	**1,5**
Partial safety factor	γ_{Mm}[1]	**2,5**	

1) In absence of other national regulations.
2) Only valid for temperature range 30/50° C.
4) Only valid for edge distance c ≥ 200 mm; intermediate values by linear interpolation.
6) Only valid for edge distance c ≥ 200 mm for temperature range 30/50° C; intermediate values by linear interpolation.

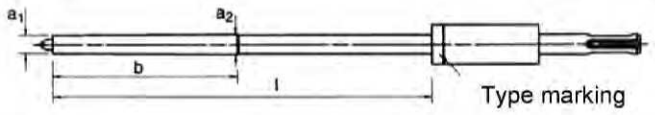
Table C14.1: Characteristic resistance F_{Rk} in [kN] in autoclaved aerated concrete (use category "d")

Base material [*Supplier Title*] Geometry, DF or nom. size (L x W x H) [mm] and drilling method	Min. compressive strength f_b [N/mm²] / bulk density ρ [kg/dm³]	Characteristic resistance F_{Rk} [kN] 50/80°C	
		URD 8	URD 10
		$h_{nom} \geq 50$ mm	
Autoclaved aerated concrete (AAC) acc. to EN 771-4:2011 e.g. (500x120x300) e.g. (500x250x300) by hammer drilling	≥ 6	-	**0,75** **0,9**[5)]
	≥ 4	-	**0,75** **0,9**[2)]
	≥ 3	-	**0,4**[3)] **0,5**[2)3)]
	≥ 2	-	**0,4**[3)] **0,5**[2)3)]
Partial safety factor	γ_{MAAC} [1)]	**2,0**	

1) In absence of other national regulations.
2) Only valid for temperature range 30/50° C.
3) For the fixing in autoclaved aerated concrete with a nominal compressive strength $f_{ck} < 4$ N/mm² the hole is made by using the accompanying AAC hole punch according Table C14.2.
5) Nur für Randabstand c ≥ 120 mm.

Table C14.2: Assignment AAC hole punch type – anchor type (length) only for AAC $f_b < 4$ N/mm² URD 10

Hole punch only for URD 10 h_{nom} = 50 mm, f_b < 4N/mm²					Anchor type
Type	a_1	a_2	b	l	(length)
GBS 10 x 80	9	10	80	85	URD 10 x **52** URD 10 x **60** URD 10 x **80**
GBS 10 x 100			90	105	URD 10 x **100**
GBS 10 x 135				140	URD 10 x **120**
GBS 10 x 160				165	URD 10 x **140** URD 10 x **160**
GBS 10 x 185				190	URD 10 x **180**
GBS 10 x 230				235	URD 10 x **200** URD 10 x **230**



frame fixing URD

Performances
Characteristic resistance for use in autoclaved aerated concrete / Assignment hole punch

Annex C 14