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to Article 29 of the Regulation (EU)
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Parliament and of the Council of 9
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MEMBER OF EOTA



European Technical Assessment ETA-22/0036 of 2022/02/17

I General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: ETA-Danmark A/S

Trade name of the construction product:

CELO ResiTHERM 37

Product family to which the above construction product belongs:

Distance fixing system

Manufacturer:

CELO Befestigungssysteme GmbH
Industriestraße 6
DE-86551 Aichach
Tel + 49 8251 90 485 0
Internet www.celofixings.com

Manufacturing plant:

CELO Befestigungssysteme GmbH
Industriestraße 6
DE-86551 Aichach

This European Technical Assessment contains:

18 pages including 22 annexes which form an integral part of the document

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

EAD 331985-00-0604 – Distance fixing system

This version replaces:

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

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II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of product

Technical description of the product

CELO ResiTHERM 37 is a post-installed anchor system placed into pre-drilled holes in masonry and autoclaved aerated concrete and anchored by bonding.

CELO ResiTHERM 37 distance fixing system consists of a cylindrical load-bearing glass fiber reinforced polyamide element with a mesh and is used together with the injection mortar. The element has an internal thread. The fixing system is placed into a pre-drilled hole perpendicular to the surface (maximum deviation 5°) in masonry or autoclaved aerated concrete, and anchored by bonding the plastic anchoring element to the wall of the drilled hole by means of mortar

The product description is given in Annex A.

2 Specification of the intended use in accordance with the applicable European Assessment Document (hereinafter EAD)

The intended use is fixings through an ETICS into the loadbearing wall of heavy-duty fixtures such as awnings, French balconies, canopies, satellite dishes, etc.

The system is used for distance installations in the following insulated base materials:

- Perforated or hollow bricks (use category c)
- Un-cracked autoclaved aerated concrete (use category d)

The system is also used for installations in the following non-insulated base materials:

- Perforated or hollow bricks (use category c)
- Un-cracked autoclaved aerated concrete (use category d)

Reference to base material group in EAD 330284-00-0604

Anchorage subject to: Static or quasi-static loads
Temperature range:

- -40°C to +40°C (max. short term temperature +40°C and max. long-term temperature +24°C)

The minimum and the maximum installation temperature are specified by the manufacturer within the above range

Use categories in respect of use:
Category d/d: Use in dry masonry
Category w/w: Use in wet masonry

This ETA applies only where masonry members in which the distance fixing systems are embedded are subject to static or quasi-static actions in tension, shear or combined tension and shear or bending. The distance fixing system are intended to be used in areas with no and very low seismicity as defined in EN 1998-1, Clause 3.2.1.

In case of a product use in ETICS, it must be ensured that no ETICS influence the installation

The performances given in Section 3 are only valid if the anchor is used in compliance with the specifications and conditions given in Annex B1 to B3

The provisions made in this European Technical Assessment are based on an assumed intended working life of the anchor of 50 years.

The indications given on the working life cannot be interpreted as a guarantee given by the producer or Assessment Body, 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 Characteristics of product

Safety in case of fire (BWR 2):

No Performance assessed

Safety in use (BWR4):

Resistance to failure under tension loading
Resistance to failure under shear loading and minimum edge distance and spacing
Resistance to pull-out under tension loading
Displacements under short term and long-term loading

The above essential characteristics are detailed in Annex C.

Durability

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

3.2 Methods of assessment

The assessment of fitness of the anchor for the intended use in relation to the requirements for mechanical resistance and stability and safety in use in the sense of the Basic Requirements 4 has been made in accordance with the EAD 331985-00-0604 – Distance fixing system.

4 Assessment and verification of constancy of performance (AVCP)


4.1 AVCP system

According to the decision 97/463/EC of the European Commission, the system(s) of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) is 2+.

5 Technical details necessary for the implementation of the AVCP system, as foreseen in the applicable EAD

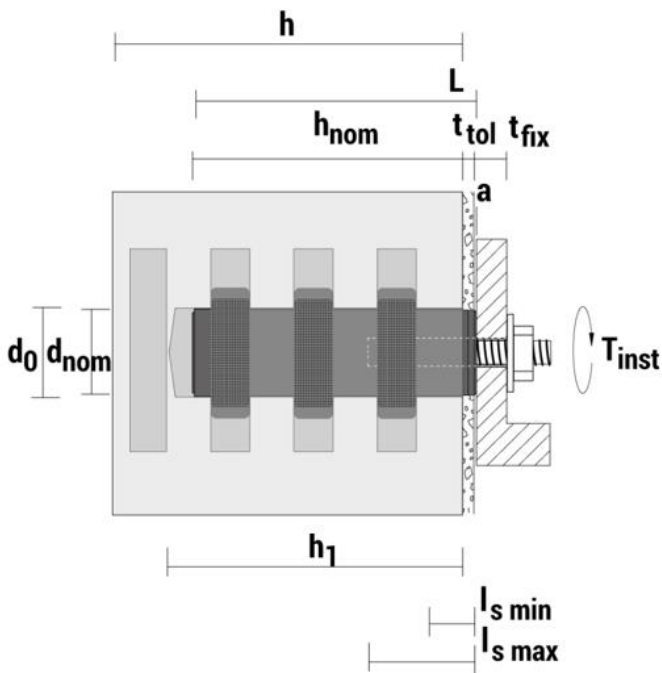
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ETA-Danmark prior to CE marking.

Issued in Copenhagen on 2022-02-17 by

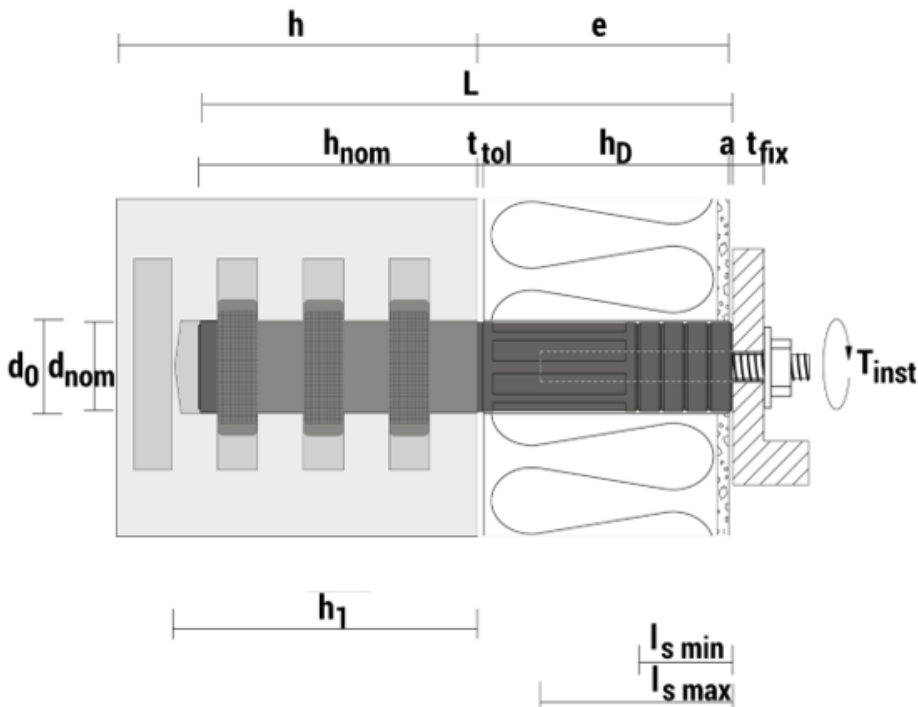


Thomas Bruun
Managing Director, ETA-Danmark

Installed conditions in hollow bricks



Single fixing without insulation



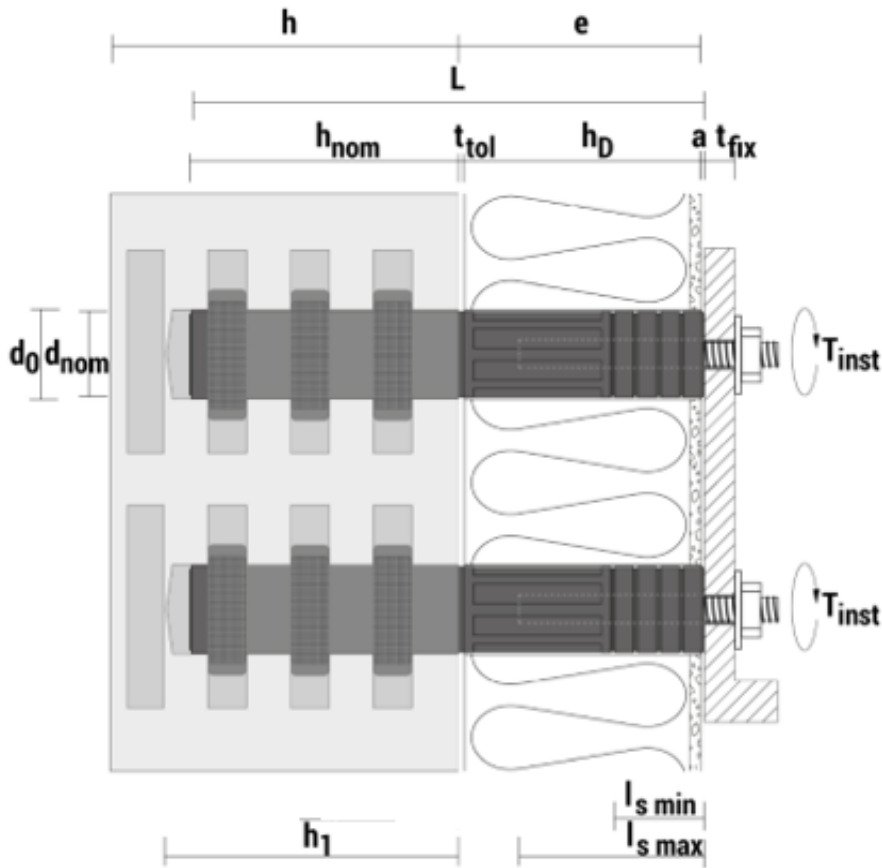
single fixing with insulation

CELO ResiTHERM® 37

Product description
Installed conditions

Annex A1

Double fixing with insulation



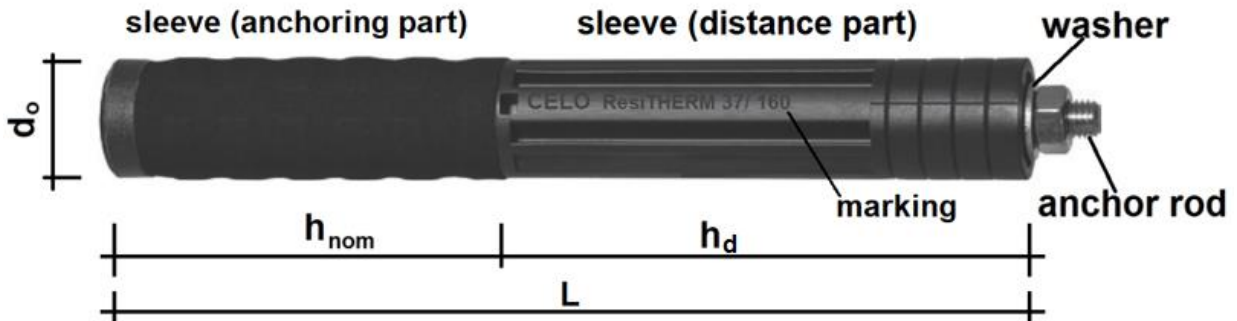
- | | | | |
|-----------|--|--------------|------------------------------|
| h_{nom} | = overall plastic anchor embedment | d_0 | = drill hole diameter |
| a | = 1-2 mm protrusion to the plaster surface | $l_{s\ min}$ | = min. screw insertion depth |
| h_1 | = depth of drilled hole to deepest point | $l_{s\ max}$ | = max. screw insertion depth |
| h_{min} | = Minimum thickness of member | t_{fix} | = thickness of fixture |
| h_D | = thickness of insulation (ETICS) | s_{min} | = min. spacing |
| L | = anchor length | T_{inst} | = setting torque moment |
| t_{tol} | = thickness plaster or unevenness | e | = $h_D + t_{tol}$ |

CELO ResiTHERM® 37

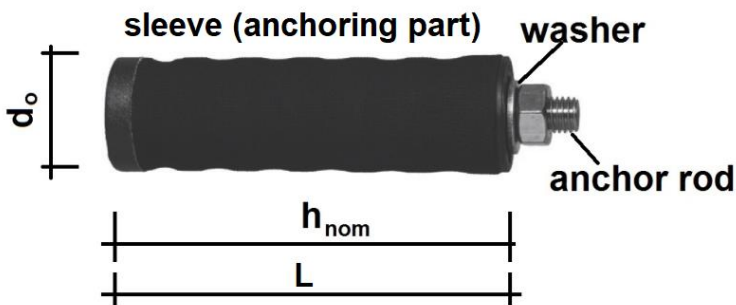
Product description
Installed conditions

Annex A2

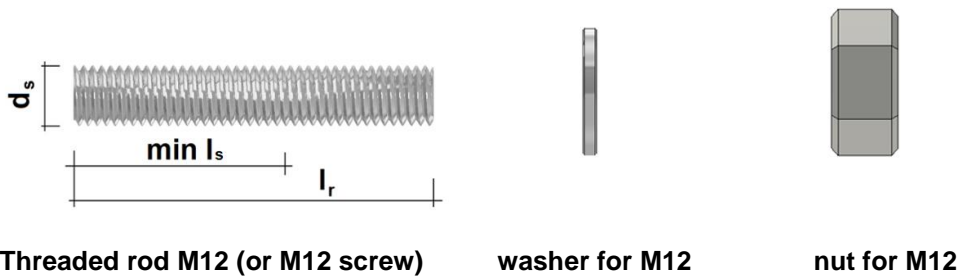
Anchor ResiTHERM®37/120 - 200



Anchor ResiTHERM®37 S



Anchor rod for ResiTHERM®37 and washer and nut



Marking:	Brand	Type	thickness of insulation (h_d)
Example:	CELO (or apolo)	ResiTHERM®37	/ 160

CELO ResiTHERM® 37

Product description
Types and marking

Annex A3

Table A3.1: Dimensions [mm]

ResiTHERM®37 anchor sleeve							
	L	Ø d_{nom}	h_{D min}	h_{D max}	h_{nom}	l_{s min}	l_{s max}
ResiTHERM®37S	125	37	0	0	125	35	80
ResiTHERM®37/120	245	37	80	120	125	35	80
ResiTHERM®37/160	285	37	120	160	125	35	80
ResiTHERM®37/200	325	37	160	200	125	35	80

Metal part (anchor rod)			
	l_r	Ø d_s	l_{s min}
for ResiTHERM®37	≥70	12	≥35

Table A3.2: Material

Designation	Material
ResiTHERM®37 anchor sleeve All lengths	Polyamid PA 6 with glasfibre
Anchor rod M12 A4 or metric screw M12 A4	Stainless steel A4 according to EN 10088-3:2014, material 1.4401 or 1.4571 property class 70
Anchor rod M12 or metric screw M12	Steel or hot dipped, galvanized fyk ≥ 400 N/mm ² and fuk ≥ 500 N/mm ² property class 5.8 screw
Hexagon nut M12 A4	Stainless steel A4 according to EN 10088-3:2014, material 1.4401 or 1.4571 Property class 70, DIN 934 (EN ISO 4032)
Hexagon nut M12	Steel or hot dipped, galvanized material 1.4401 or 1.4571 Property class ≥ 6, DIN 934 (EN ISO 4032)
Washer A4	Stainless steel A4, DIN 125
Washer	Steel or hot dipped, galvanized, DIN 125
Injection mortar	Vinylester VYSF

CELO ResiTHERM® 37

Product description
 Dimensions and materials

Annex A4

Specification of intended use

Anchorage subject to:

- Static and quasi-static actions in tension, shear or combined tension and shear load or bending. The anchor shall not be used for the transmission of dead loads of the thermal insulation composite system.

Base material:

- Hollow brick masonry (base material group c) according to Annex C2
- Mortar strength class of the masonry \geq M2,5 according to EN 998-2:2010
- Autoclaved aerated concrete uncracked (base material group d)

Temperature Range for use:

- a: -40°C to +40°C (max. short term temperature +40°C and max. long-term temperature +24°C) of the base material

Design:

- The anchorages are to be designed under the responsibility of an engineer experienced in anchorages and masonry work with the applicable safety factors.
- 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.

Installation:

- Hole drilling by the drill methods according to Annex C2 for base material group c.
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Temperature of the plug at installation from 0°C to + 40°C.
- Exposure to UV due to solar radiation of the anchor not protected \leq 6 weeks.

CELO ResiTHERM® 37	Annex B1
Product description Specification of intended use	

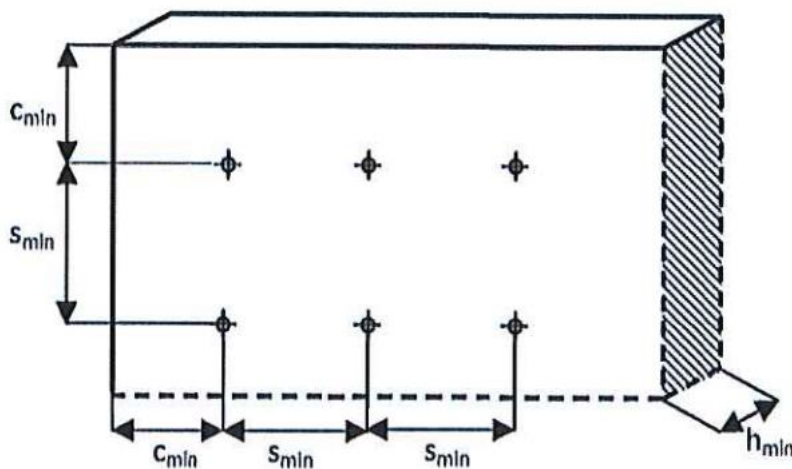
Table B2.1: Installation parameters

Anchor type			ResiTHERM®37
Overall embedment depth of the anchoring part of the sleeve in the base material	$h_{nom} \geq$	[mm]	125*
Drill hole diameter	d_0	[mm]	39-40
Depth of drill hole to the deepest point ¹⁾	$h_1 \geq$	[mm]	135
Diameter of clearance hole in the fixture	$d_f \geq$	[mm]	13
Screw in depth of the threaded rod M12	l_s	[mm]	35 - 80
Maximum installation moment	$T_{inst} \leq$	[Nm]	20

* h_{nom} can be reduced by 10 mm if necessary.

Table B2.2: Minimum thickness of member, edge distance and anchor spacing

ResiTHERM®37	Minimum thickness of member	Minimum edge distance	Minimum spacing
	h_{min} [mm]	c_{min} [mm]	s_{min} [mm]
Base material			
concrete C20/25 to C50/60	200	125	77
Hollow clay brick HLz 6-0,65 - 10DF	300	125	77
Hollow clay brick HLz 12-1.0 - 12DF	240	125	77



CELO ResiTHERM® 37

Product description
Installation parameters, edge distance, anchor spacing

Annex B2

Table B3: Geometry of bricks

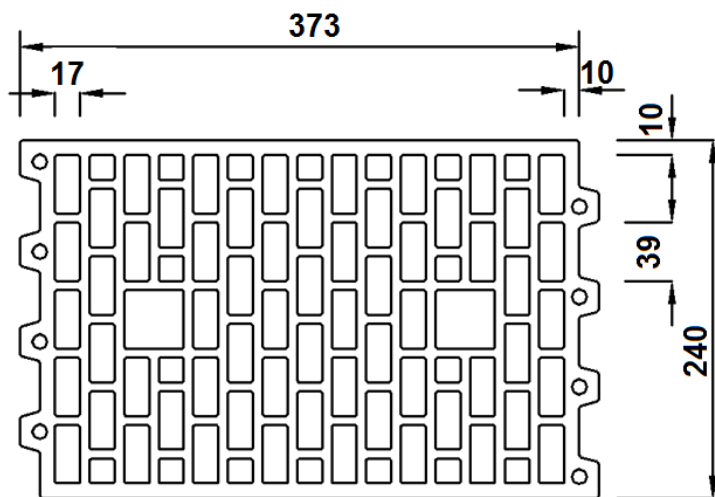


Fig. 1 HLz 12 – 1.0 12DF (hollow brick)

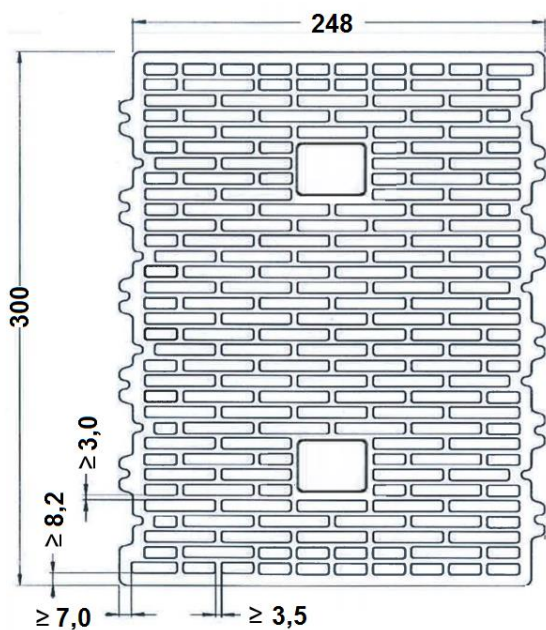


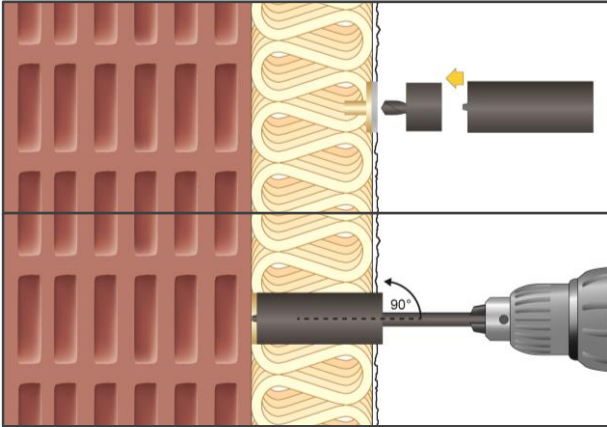
Fig. 2 HLz 6 – 0,65 (T10) 10 DF (hollow brick)

CELO ResiTHERM® 37

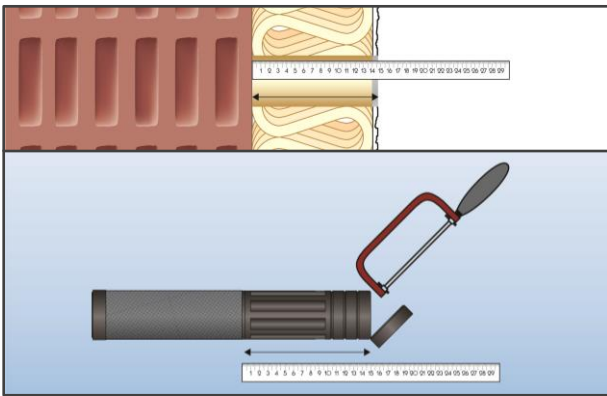
Intended use
Geometry of bricks

Annex B3

Installation instruction in brick (1-4)
ResiTHERM®37/120 - 200

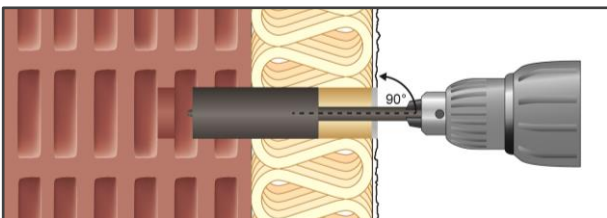


1. Put drilling aid on core bit: drill with cordless screwdriver (without impact) through the insulation material up to the hollow brick wall (\varnothing driller 39 to 40 mm). Remove drilling aid after the first 10 mm.

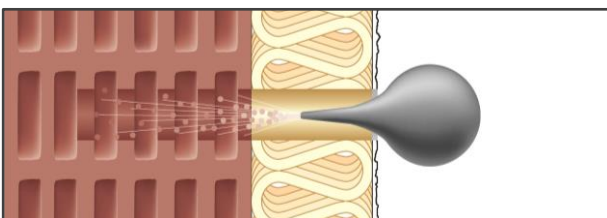


2. Measure the thickness of the insulation including plaster, select the right length of ResiTHERM® 37 and cut ResiTHERM® 37 if needed (max. 40 mm) using a metal saw or similar. Each marking ring equals 10 mm.

Please note: ResiTHERM® 37 can be installed up to 10 mm less deep \rightarrow min. $h_{nom} = 115$ mm



3. Drill min. 130 mm into the hollow brick (without impact) by using a cordless screw driver or similar.



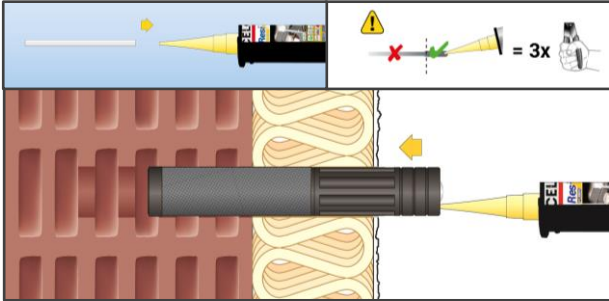
4. Clean the drill hole.

CELO ResiTHERM® 37

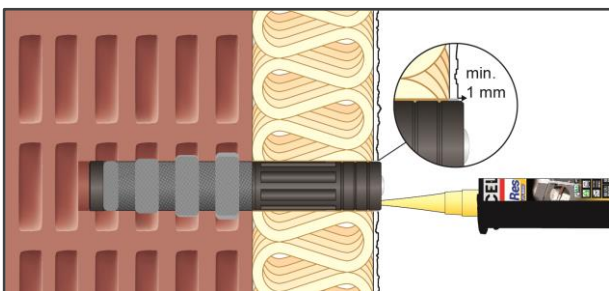
Intended use
 Installation instruction in brick

Annex B4

Installation instruction in brick (5-9)
ResiTHERM®37/120 - 200

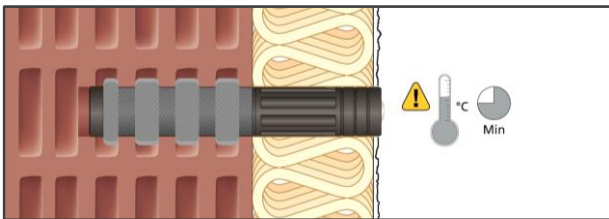


5. Attach the mixing nozzle to the ResiFIX VYSF cartridge and discard a minimum of three full strokes. Then press ResiTHERM®37 onto the mixing nozzle and push it carefully into the drill hole.

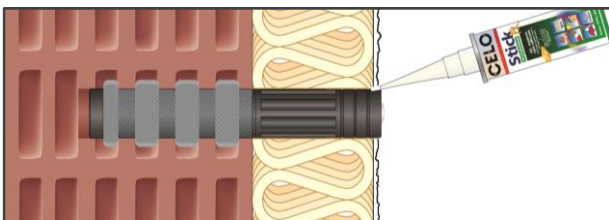


6. Fill ResiTHERM®37 with injection system ResiFIX VYSF. The end of the filling process can be clearly felt. Necessary amount of ResiFIX VYSF resin is 140 ml.

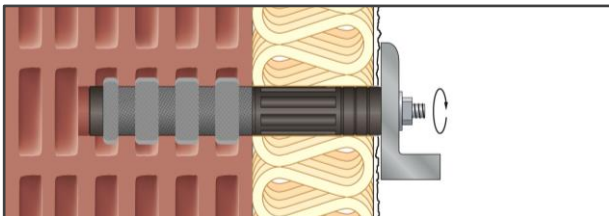
Important: Observe approx. 1 mm protrusion to the plaster surface.



7. Respect the curing time as indicated on the ResiFIX VYSF label.



8. Fill the annular gap with sealant, e.g. StickFX XP, MS Polymer.



9. Remove the thread protection cap. Install fixture, observe max. $T_{inst.} = 20 \text{ Nm}$.

Please note: The threaded stud or the threaded screw M12 should be screwed into the ResiTHERM®37 to a depth of at least 35 mm.

CELO ResiTHERM® 37

Intended use
 Installation instruction in brick

Annex B5

Table C1.1: Characteristic tension and shear load resistance of the anchor rod

Anchor rod \varnothing 12 mm			stainless steel
Charact. tension load resistance	$N_{Rk,s}$	[kN]	59
Partial safety factor ¹⁾	γ_{Ms}		1,87
Characteristic shear load resistance	$V_{Rk,s}$	[kN]	30
Partial safety factor ¹⁾	γ_{Ms}		1,56

Table C1.2 : Characteristic tension load resistance N_{Rk} [kN] in hollow masonry (base material group "c") for single anchor

ResiTHERM®37	Bulk density class ρ	Minimum compressive Strength f_b	Minimum DF or minimum size (L x W x H)	figure/ geometry	drill method R= rotary	Characteristic resistance $N_{Rk,p}$ [kN] $\vartheta = 24/40$ °C
Base material	[kg/dm ³]	[N/mm ²]	[mm]			
Hollow clay brick HLz 12 EN 771-1:2011+A1:2015	1,0	12	12 DF (373*240*249)	Annex B3 figure 1	R only	6,00
Hollow clay brick HLz 6 EN 771-1:2011+A1:2015	0,65	6	10 DF (240*300*249)	Annex B3 figure 2	R only	3,00
Partial safety factor bricks ¹⁾					γ_{Mm}	2,5

Table C1.3 : Characteristic tension load resistance N_{Rk} [kN] in hollow masonry (base material group "c") for double anchor (min spacing = 77 mm)

ResiTHERM®37	Bulk density class ρ	Minimum compressive Strength f_b	Minimum DF or minimum size (L x W x H)	figure/ geometry	drill method R= rotary	Characteristic Resistance ²⁾ $N_{Rk,p}$ [kN] $\vartheta = 24/40$ °C
Base material	[kg/dm ³]	[N/mm ²]	[mm]			
Hollow clay brick HLz 12 EN 771-1:2011+A1:2015	1,0	12	12 DF (373*240*249)	Annex B3 figure 1	R only	5,50
Hollow clay brick HLz 6 EN 771-1:2011+A1:2015	0,65	6	10 DF (240*300*249)	Annex B3 figure 2	R only	1,50
Partial safety factor bricks ¹⁾					γ_M	2,5

¹⁾ In absence of other national regulations

²⁾ Value is for one anchor pair

CELO ResiTHERM®37

Performances

Characteristic tension load resistance in masonry

Annex C1

Table C2.1: Characteristic shear load resistance in HLz 12 for different insulation thicknesses

ResiTHERM®37	Insulation thickness ²⁾	$h_D = 0$ mm	$h_D = 120$ mm	$h_D = 160$ mm	$h_D = 200$ mm
Single anchor					
Characteristic shear load resistance ³⁾	V_{Rk1} [kN]	3,00	1,20	1,20	0,90
Partial safety factor ¹⁾	γ_M	2,5	2,5	2,5	2,5
Double anchor ($s_{min} = 77$ mm)					
Characteristic shear load resistance	V_{Rk2} [kN]	4,50	1,80	1,50	1,20
Partial safety factor ¹⁾	γ_M	2,5	2,5	2,5	2,5

¹⁾ In absence of other national regulations

²⁾ Intermediate values by linear interpolation

³⁾ shear load at the outer end of the ResiTHERM

Table C2.2: Characteristic shear load resistance in HLz 6 for different insulation thicknesses

ResiTHERM®37	Insulation thickness ²⁾	$h_D = 0$ mm	$h_D = 120$ mm	$h_D = 160$ mm	$h_D = 200$ mm
Single anchor					
Characteristic shear load resistance ³⁾	V_{Rk1} [kN]	1,50	0,90	0,90	0,60
Partial safety factor ¹⁾	γ_M	2,5	2,5	2,5	2,5
Double anchor ($s_{min} = 77$ mm)					
Characteristic shear load resistance	V_{Rk2} [kN]	0,60	0,40	0,40	0,30
Partial safety factor ¹⁾	γ_M	2,5	2,5	2,5	2,5

Table C2.3: Characteristic pressure load resistance $F_{u,s/p,5\%} = \text{max. char. buckling loads}$ under combined shear load V and pressure load, deviation 0 – 15 mm

ResiTHERM®37				
Cantilever size	Permanent displacement in direction of the shear load	Shear load V	Max. pressure load * $F_{u,s/p,5\%}$ = max. buckling loads	δ_m due to pressure load
[mm]	[mm]	[kN]	kN	[mm]
200	0	-	25,7	-
200	5	0,42	17,8	9,50
200	10	0,83	13,1	5,81
200	15	1,25	13,4	6,34

*The brick failure load must be considered.

CELO ResiTHERM® 37

Performances

Characteristic shear load resistance in masonry and max. combined load V and F

Annex C2

Table C3.1: Displacements under tension load

ResiTHERM®37	Tension load	displacement	displacement
	N	δ_{N0}	$\delta_{N\infty}$
Base material	[kN]	[mm]	[mm]
Hollow brick HLz 12			
Single anchor	1,7	0,6	1,3
Double anchor	1,6	0,4	0,9
Hollow brick HLz 6			
Single anchor	0,9	0,6	1,2
Double anchor	0,4	0,2	0,4

Table C3.2: Displacements under shear load for single anchor

ResiTHERM®37		Shear load	displacement	displacement
		V	δ_{V0}	$\delta_{V\infty}$
Base material		[kN]	[mm]	[mm]
HLZ 12	Insulation thickness h_D			
Single anchor	0	0,9	0,2	0,3
	120	0,3	2,0	4,1
	160	0,3	2,1	4,3
	200	0,3	3,4	6,7
HLZ 6	Insulation thickness h_D			
Single anchor	0	0,4	0,0	0,1
	120	0,3	1,3	2,6
	160	0,3	1,7	3,5
	200	0,2	2,0	4,0

CELO ResiTHERM® 37

Performances
Displacements under tension and shear load

Annex C3

Table C4.1: Displacements under shear load for double anchor*

ResiTHERM®37		Shear load	displacement	displacement
		$V^{1)}$	δ_{NO}	$\delta_{N\infty}$
Base material		[kN]	[mm]	[mm]
HLZ 12	Insulation thickness h_D			
Double anchor	0	1,3	0,6	1,2
	120	0,5	1,6	3,2
	160	0,4	0,7	1,4
	200	0,3	1,4	2,9
HLZ 6	Insulation thickness h_D			
Double anchor	0	0,2	0,1	0,2
	120	0,1	0,2	0,3
	160	0,1	0,2	0,3
	200	0,1	0,3	0,5

* with spacing min. 77 mm

CELO ResiTHERM® 37

Performances
Displacements under shear load for double anchor

Annex C4