Deutsches Institut für Bautechnik

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Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments

Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment)

European Technical Assessment

ETA-22/0828 of 8 December 2022

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	CN CARBON
Product family to which the construction product belongs	Nailed-in plastic anchor for fixing of external thermal insulation composite systems with rendering in concrete and masonry
Manufacturer	DAW Italia GmbH & Co KG Largo R. Murjahn 1 20080 VERMEZZO (MI) ITALIEN
Manufacturing plant	DAW
This European Technical Assessment contains	22 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	EAD 330196-01-0604, Edition 10/2017

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Specific Part

1 Technical description of the product

The nailed-in anchor CN CARBON 8 110-230 and CNplus CARBON 8 110-230 consists of an anchor sleeve with an enlarged shaft made of polypropylene (virgin material), an insulation plate made of glass fibre reinforced polyamide (virgin material) and a special compound nail consisting of two parts, one made of glass fibre reinforced polyamide for the shaft element and the other part made of galvanised steel.

The nailed-in anchor CN CARBON 8 250-390 and CN CARBON 8 R 250-310 consists of an anchor sleeve made of polypropylene (virgin material), a shaft part, whose the serrated expanding part is slotted, such as an insulation plate made of glass fibre reinforced polyamide (virgin material).

The nailed-in anchor CN CARBON 8 250-390 and CN CARBON 8 R 250-310 made of galvanised steel and is used together with a plastic cylinder made of glass fiber reinforced polyamide.

The fischer nailed-in anchor CNplus CARBON 8 250-390 consists of an anchor sleeve made of polypropylene (virgin material), a shaft part made of polyamide (virgin material), whose the serrated expanding part is slotted, an insulation plate made of glass fibre reinforced polyamide (virgin material) and a special compound nail consisting of two parts, one made of glass fibre reinforced polyamide for the shaft element and the other part made of galvanised steel.

All anchors may in addition be combined with the anchor plates DT 90, DT 110 and DT 140.

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 verification and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the anchor of at least 25 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 Safety and accessibility in use (BWR 4)

Essential characteristic	Performance
Characteristic load bearing capacity - Characteristic resistance under tension load - Minimum edge distance and spacing	 See Annex C 1 - C 2 See Annex B 2
Displacements	See Annex C 5
Plate stiffness	See Annex C 4

3.2 Energy economy and heat retention (BWR 6)

Essential characteristic	Performance
Point thermal transmittance	See Annex C 3 - C 4

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

In accordance with EAD No. 330196-01-0604, 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 EAD

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

The following standards and documents are referred to in this European Technical Assessment:

-	EOTA Technical Report TR 025, Edition May 2016	Point Thermal Transmittance of Plastic Anchors for ETICS
-	EOTA Technical Report TR 026, Edition May 2016	Plate Stiffness of Plastic Anchors for ETICS
-	EOTA Technical Report TR 051, Edition April 2018	Job site tests of plastic anchors and screws
-	EN 206:2013	Concrete - Specification, performance, production and conformity
-	EN 771-1:2011+A1:2015	Specification for masonry units - Part 1: Clay masonry units
-	EN 771-2:2011+A1:2015	Specification for masonry units - Part 2: Calcium silicate masonry units
-	EN 771-3:2011+A1:2015	Specification for masonry units - Part 3: Aggregate concrete masonry units (Dense and lightweight aggregates)
-	EN 771-4:2011+A1:2015	Specification for masonry units - Part 4: Autoclaved aerated concrete masonry units
-	EN 1520:2011	Prefabricated reinforced components of lightweight aggregate concrete with open structure
-	EN ISO 4042:2018-11	Fasteners - Electroplated coating systems

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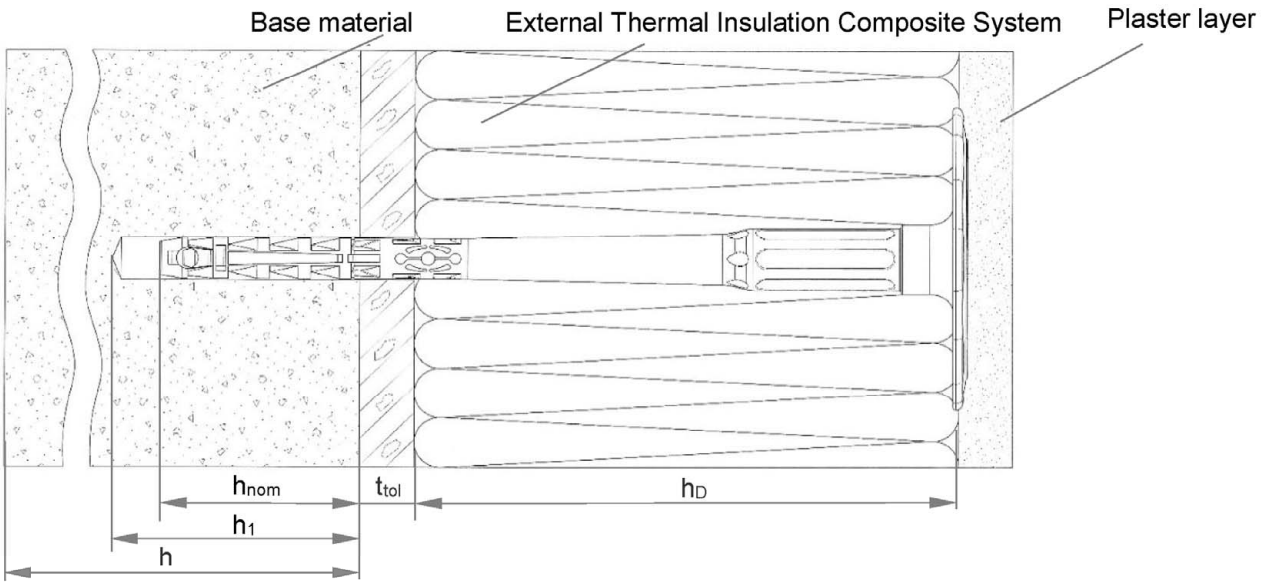
Dipl.-Ing. Beatrix Wittstock
Head of Section

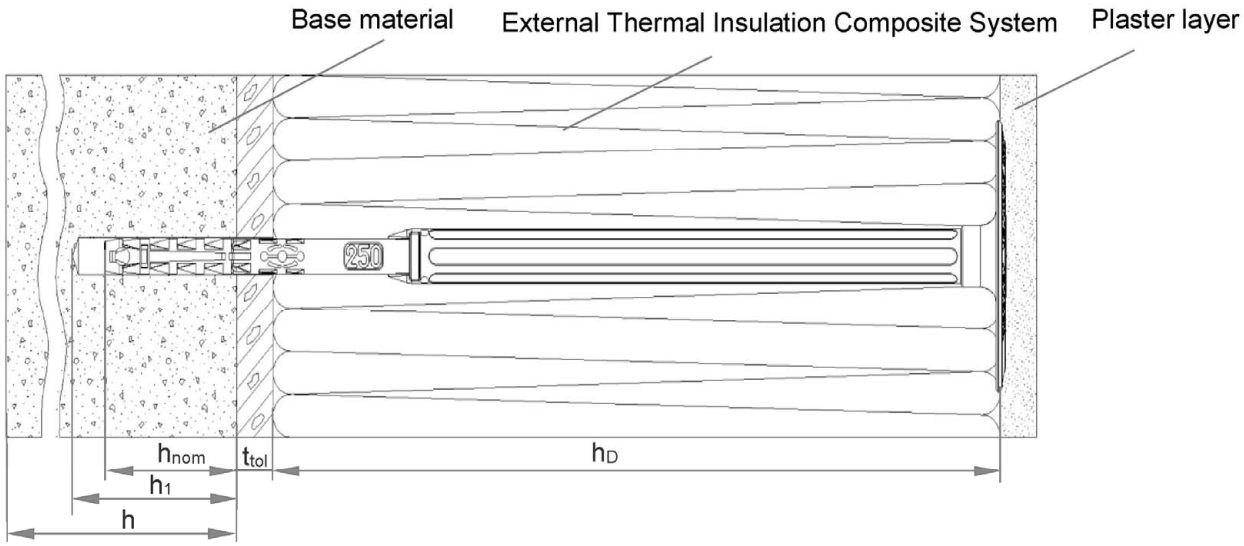
beglaubigt:
Aksünger

Deutsches Institut für Bautechnik DIBt

CN CARBON 8 / 110 – 230 / CNplus CARBON 8 / 110 – 230 – mounting on the surface



CN CARBON 8 / 250 – 390 / CN CARBON 8 R / 250 – 310 / CNplus CARBON 8 / 250 - 390 – mounting on the surface



Legend

h_{nom}= Overall plastic anchor embedment depth in the base material
h_1 = Depth of drilled hole to deepest point
h = Thickness of member (wall)
h_D = Thickness of insulation material
t_{tol} = Thickness of equalising layer and / or non-load bearing coating

Figures not to scale

CN CARBON 8 | CN CARBON 8 R | CNplus CARBON 8	Annex A 1
Product description Installed anchor – mounting on the surface	

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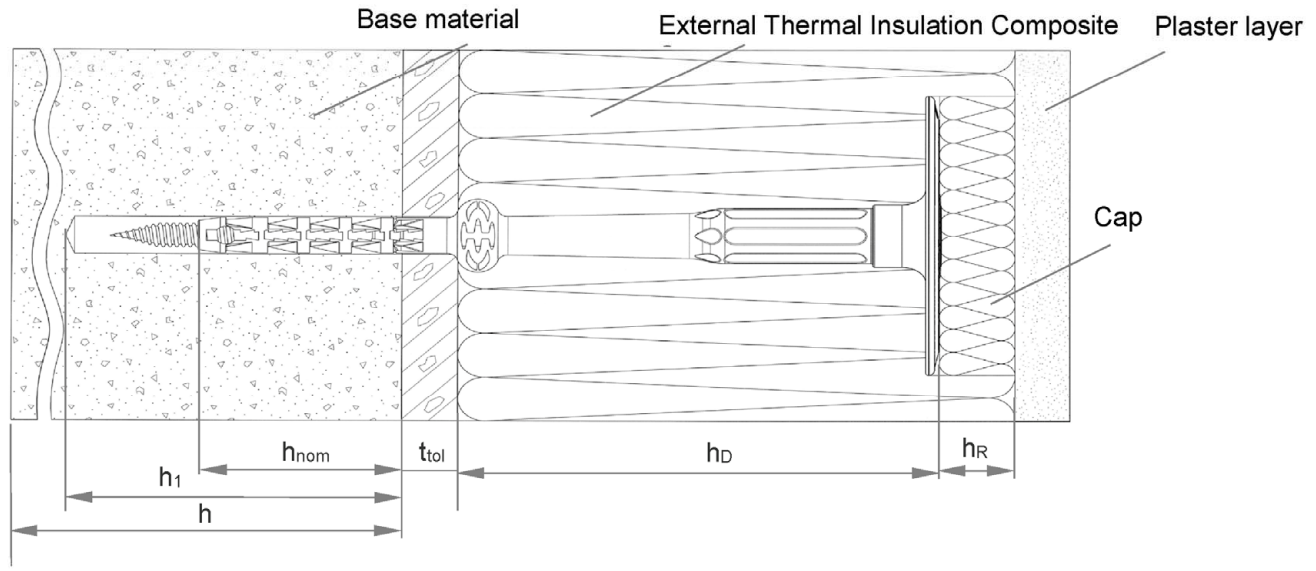
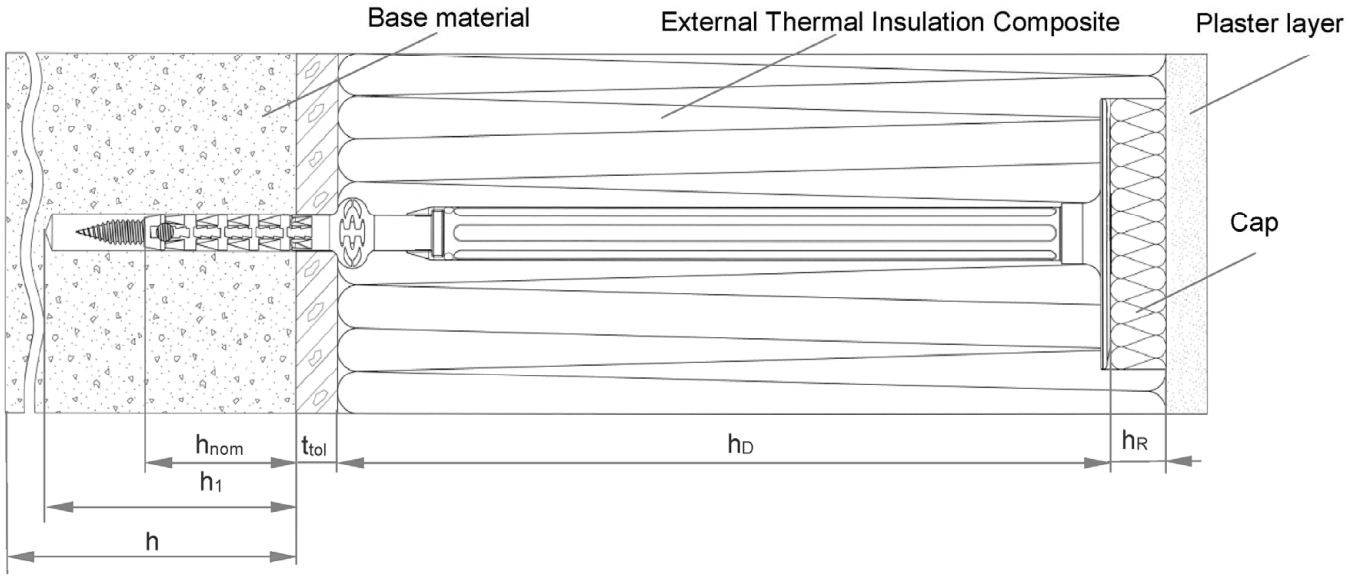
CNplus CARBON 8 / 110 – 230 – countersunk mounting



CNplus CARBON 8 / 250 – 390 – countersunk mounting



Legend

h_{nom}	=	Overall plastic anchor embedment depth in the base material
h_1	=	Depth of drilled hole to deepest point
h	=	Thickness of member (wall)
h_D	=	Thickness of insulation material
h_R	=	Thickness of cap
t_{tol}	=	Thickness of equalising layer and / or non-load bearing coating

Figures not to scale

CN CARBON 8 | CN CARBON 8 R | CNplus CARBON 8	Annex A 2
Product description Installed anchor – mounting on the surface	

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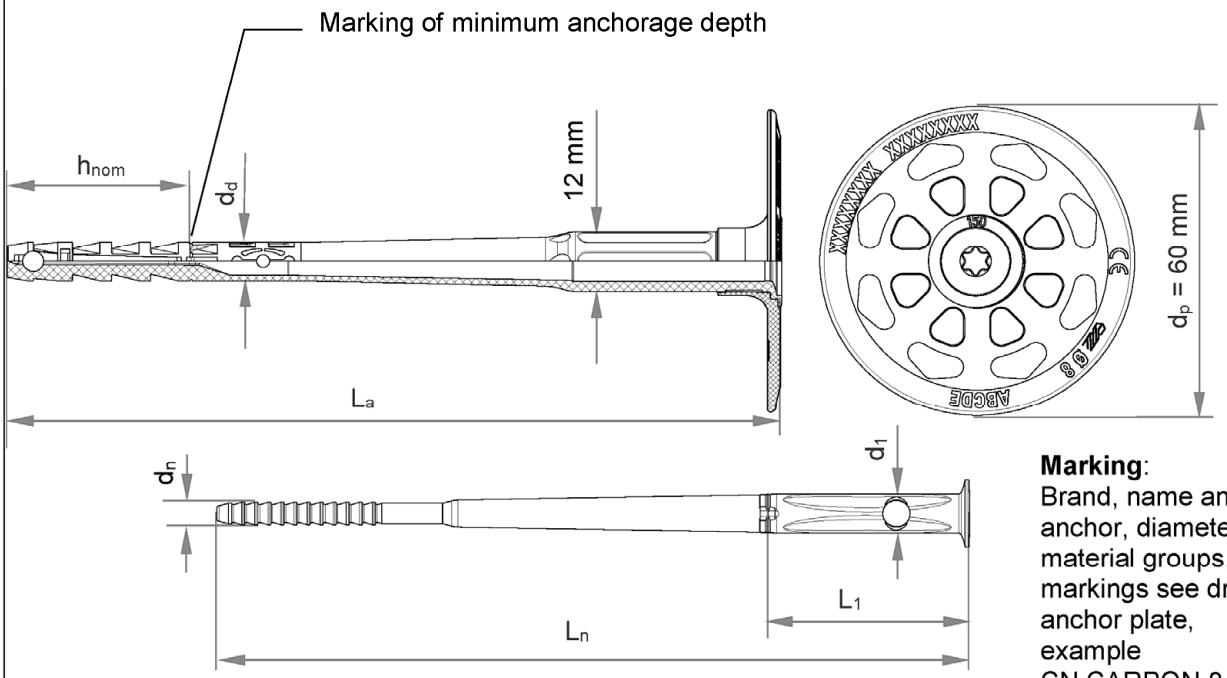
CN CARBON 8 / 110 – 230



Marking:
Brand, name and size of anchor, diameter, base material groups, optional markings see drawing of anchor plate,
example
CN CARBON 8 ABCDE

Various length of the anchors are possible.

e.g. for CN CARBON 8 / 110 - 230:
110 mm ≥ L_a ≤ 230 mm
$L_a = L_n + 4$ mm

Table A3.1: Dimensions CN CARBON 8 / 110 – 230

Anchor type	Anchor sleeve		Specific compound nail		
	d_d [mm]	h_{nom} [mm]	d_n [mm]	L_1 [mm]	d_1 [mm]
CN CARBON 8 / 110 - 230	8	35/55[1)]	4,4	40	8

[1)] Only valid for base material group "E".

Determination of maximum thickness of insulation: maximum $h_D = L_a - h_{nom} - t_{tol}$

e.g. for CN CARBON 8x150:
L_a = 148 mm, h_{nom} = 35 mm, t_{tol} = 10 mm

maximum h_D = 148 - 35 - 10 = 103 mm
→ recommended h_D = 100 mm

Figures not to scale

CN CARBON 8 | CN CARBON 8 R | CNplus CARBON 8	Annex A 3
Product description Dimensions CN CARBON 8 / 110 – 230	

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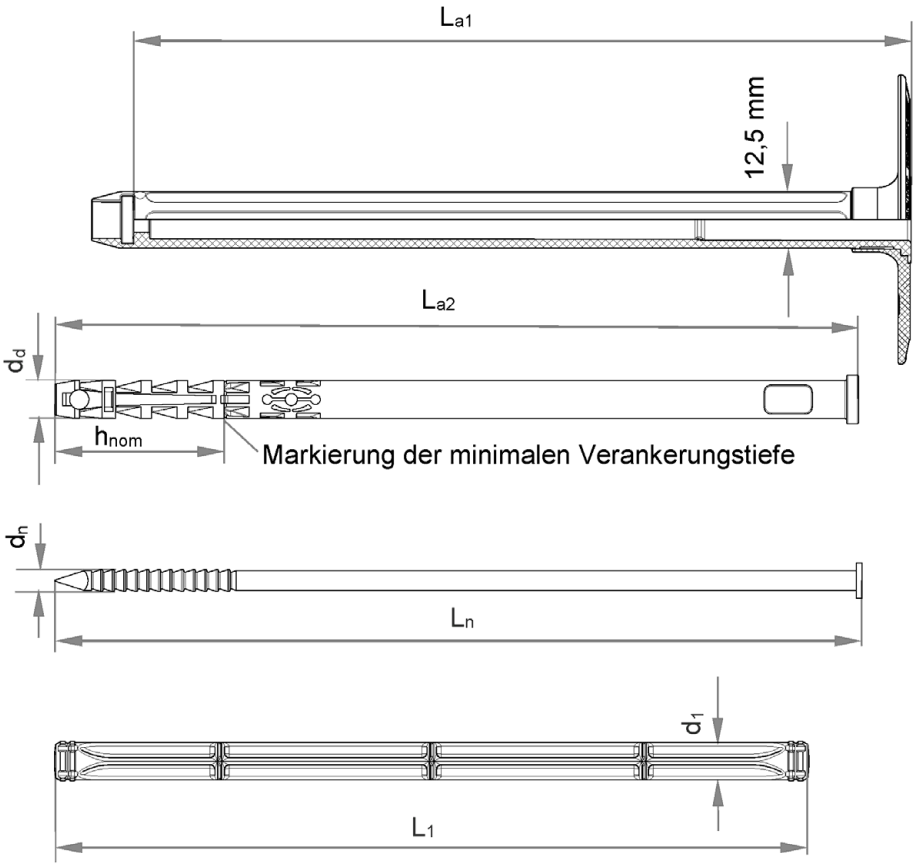
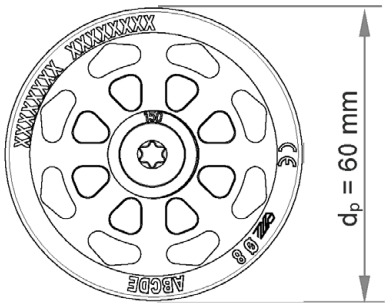
CN CARBON 8 / 250 – 390





Marking:
Brand, name and size of anchor, diameter, base material groups, optional markings see drawing of anchor plate,
example
CN CARBON 8 ABCDE

Various length of the anchors are possible.

e.g. for CN CARBON 8 / 250 – 390:
250 mm ≥ L_{a1} + L_{a2} ≤ 390 mm
L_a = L_{a1} + L_{a2} = L_n + 160,5 mm

Table A4.1: Dimensions CN CARBON 8 / 250 – 390

Anchor type	Shaft	Anchor sleeve			Nail		Plastic cylinder	
	L_{a1} [mm]	d_d [mm]	h_{nom} [mm]	L_{a2} [mm]	d_n [mm]	L_n [mm]	L_1 [mm]	d_1 [mm]
CN CARBON 8 / 250 – 390	161	8	35/55[1)]	87 - 247	4,5	(L_{a1}+L_{a2}) – 160,5	157	8

[1)] Only valid for base material group "E".

Determination of maximum thickness of insulation: maximum h_D = L_a – h_{nom} – t_{tol}

e.g. for CN CARBON 8x330:
L_a = 328 mm, h_{nom} = 35 mm, t_{tol} = 10 mm

maximum h_D = 328 – 35 – 10 = 283 mm
→ recommended h_D = 280 mm

Figures not to scale

CN CARBON 8 | CN CARBON 8 R | CNplus CARBON 8	Annex A 4
Product description Dimensions CN CARBON 8 / 250 – 390	

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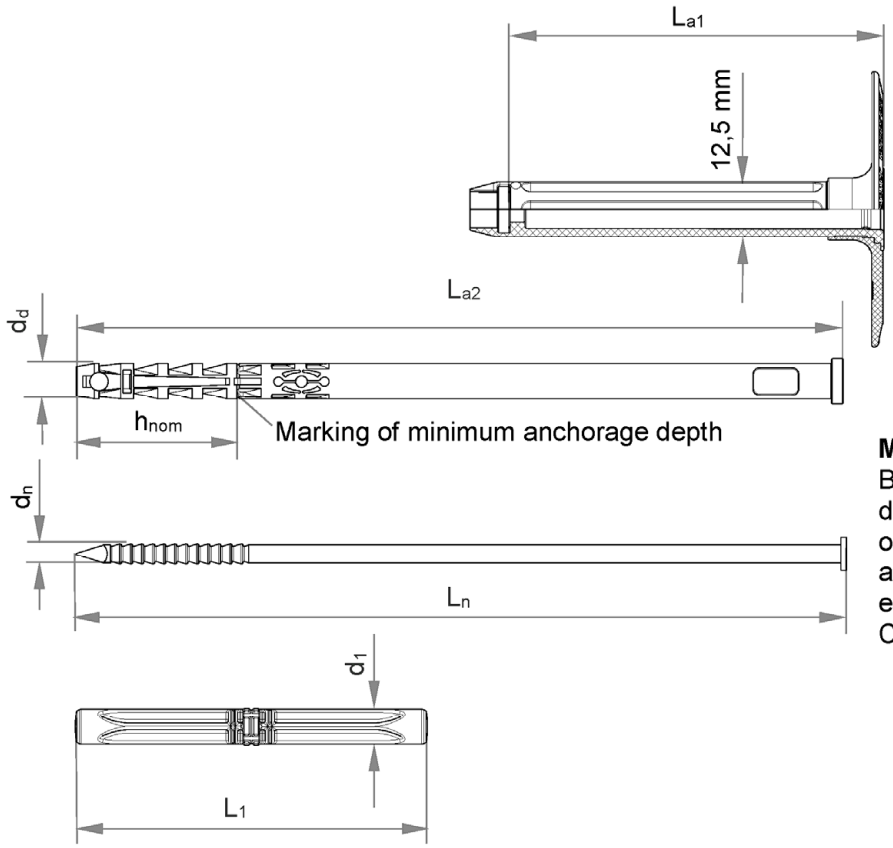
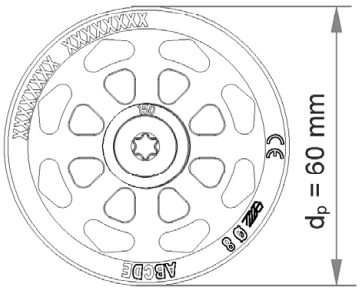
CN CARBON 8 R / 250 – 310





Marking:
Brand, name and size of anchor, diameter, base material groups, optional markings see drawing of anchor plate,
example
CN CARBON 8 R ABCDE

Various length of the anchors are possible.

z. B. für CN CARBON 8 R / 250 – 310:
250 mm ≥ L_{a1} + L_{a2} ≤ 310 mm
L_a = L_{a1} + L_{a2} = L_n + 80,5 mm

Table A5.1: Dimensions CN CARBON 8 R / 250 – 310

Anchor type	Shaft	Anchor sleeve			Nail		Plastic cylinder	
	L_{a1} [mm]	d_d [mm]	h_{nom} [mm]	L_{a2} [mm]	d_n [mm]	L_n [mm]	L_1 [mm]	d_1 [mm]
CN CARBON 8 R / 250 – 310	81	8	35/55[1)]	167 - 247	4,5	(L_{a1}+L_{a2}) – 80,5	77	8

[1)] Only valid for base material group "E".

Determination of maximum thickness of insulation: maximum h_D = L_a – h_{nom} – t_{tol}

e.g. for CN CARBON 8 R 8x250:
L_a = 248 mm, h_{nom} = 35 mm, t_{tol} = 10 mm

maximum h_D = 248 – 35 – 10 = 203 mm
→ recommended h_D = 200 mm

Figures not to scale

CN CARBON 8 | CN CARBON 8 R | CNplus CARBON 8	Annex A 5
Product description Dimensions CN CARBON 8 R / 250 – 310	

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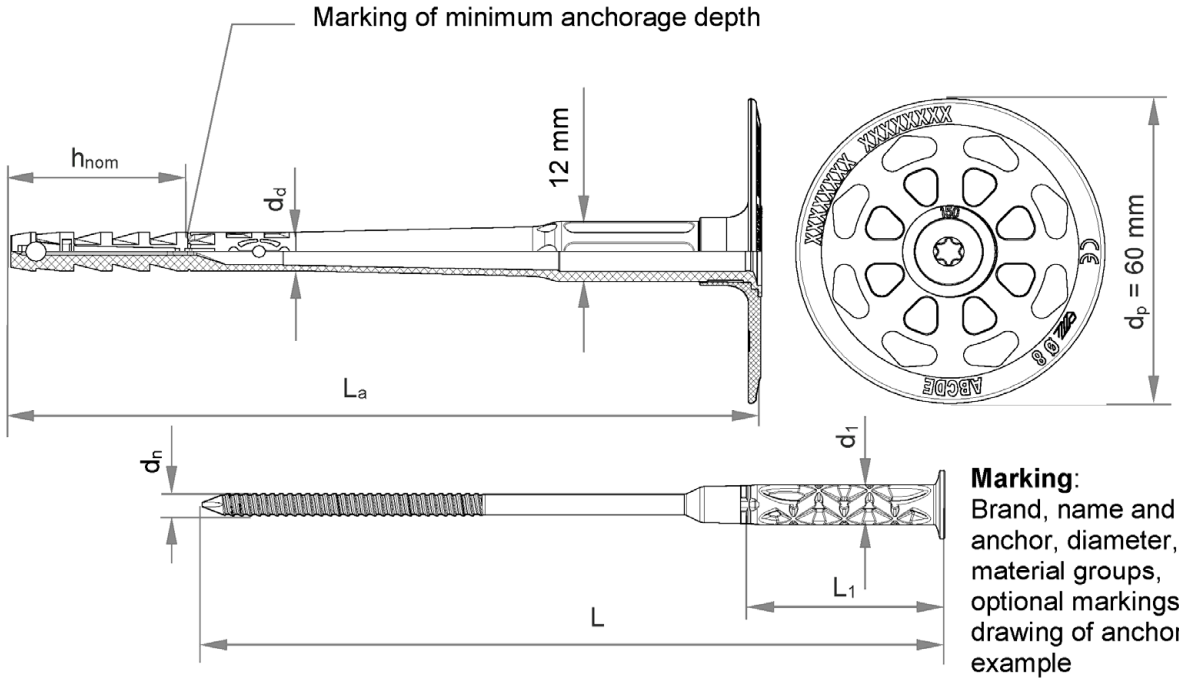
CNplus CARBON 8 / 110 – 230



Marking:
Brand, name and size of anchor, diameter, base material groups, optional markings see drawing of anchor plate, example
CNplus CARBON 8
ABCDE

Various length of the anchors are possible.

e.g. for CNplus CARBON 8 / 110 – 230:
110 mm ≥ L_a ≤ 230 mm
$L_a = L_n + 1{,}5$ mm

Table A6.1: Dimensions CNplus CARBON 8 / 110 – 230

Anchor type	Anchor sleeve		Specific compound nail			
	d_d [mm]	h_{nom} [mm]	d_n [mm]	L_n [mm]	L_1 [mm]	d_1 [mm]
CNplus CARBON 8 / 110 - 230	8	35/55[1)]	4,3	L_a – 1,5	40	8

[1)] Only valid for base material group “D” and “E”.

Determination of maximum thickness of insulation: maximum $h_D = L_a - h_{nom} - t_{tol}$

e.g. for CNplus CARBON 8x150:
L_a = 148 mm, h_{nom} = 35 mm, t_{tol} = 10 mm

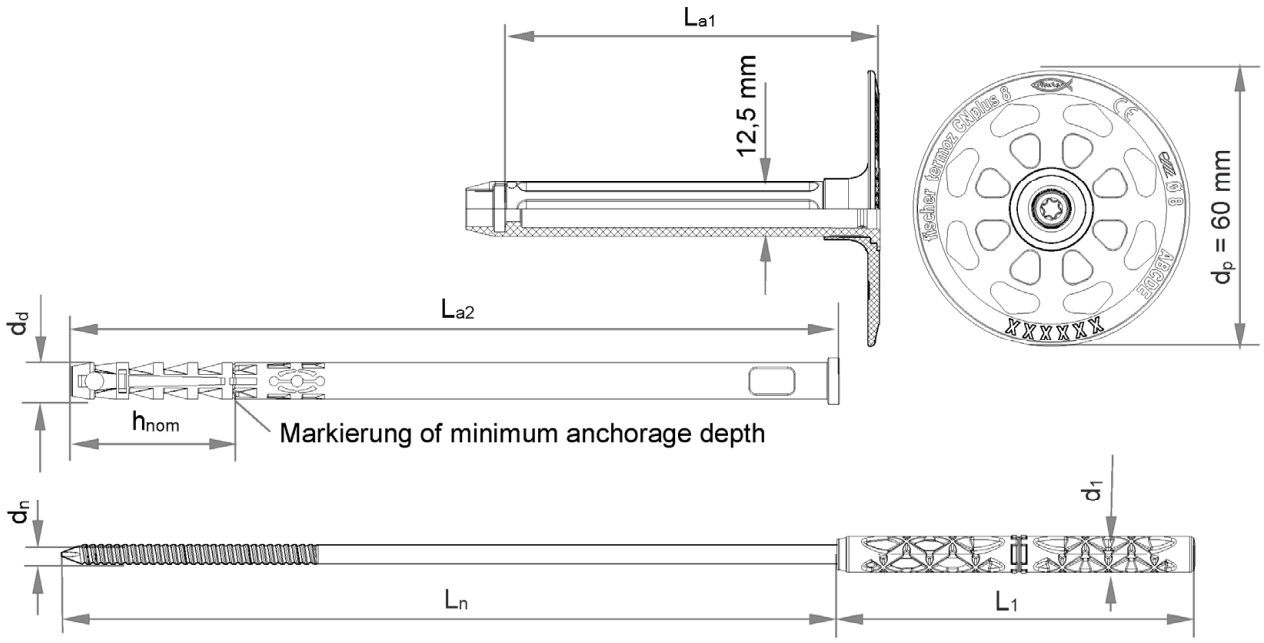
maximum h_D = 148 - 35 - 10 = 103 mm
→ recommended h_D = 100 mm

Figures not to scale

CN CARBON 8 | CN CARBON 8 R | CNplus CARBON 8	Annex A 6
Product description Dimensions CNplus CARBON 8 / 110 – 230	

Deutsches Institut für Bautechnik DIBt

CNplus CARBON 8 / 250 – 310



Various length of the anchors are possible.

e.g. for CNplus CARBON 8 / 250 – 310:
250 mm ≥ L_{a1} + L_{a2} ≤ 310 mm
L_a = L_{a1} + L_{a2} = L_n + 79,5 mm

Marking:
Brand, name and size of anchor, diameter, base material groups, optional markings see drawing of anchor plate,
example
CNplus CARBON 8 ABCDE

Table A7.1: Dimensions CNplus CARBON 8 / 250 – 310

Anchor type	Shaft	Anchor sleeve			Specific compound nail			
	L_{a1} [mm]	d_d [mm]	h_{nom} [mm]	L_{a2} [mm]	d_n [mm]	L_n [mm]	L_1 [mm]	d_1 [mm]
CNplus CARBON 8 / 250 – 310	81	8	35/55[1)]	167 - 247	4,3	(L_{a1}+L_{a2}) - 79,5	77,5	8

[1)] Only valid for base material group “D” and “E”.

Determination of maximum thickness of insulation: maximum h_D = L_a – h_{nom} – t_{tol}

e.g. for CNplus CARBON 8x250:
L_a = 248 mm, h_{nom} = 35 mm, t_{tol} = 10 mm

maximum h_D = 248 – 35 – 10 = 203 mm
→ recommended h_D = 200 mm

Figures not to scale

CN CARBON 8 | CN CARBON 8 R | CNplus CARBON 8	Annex A 7
Product description DimensionsCNplus CARBON 8 / 250 – 310	

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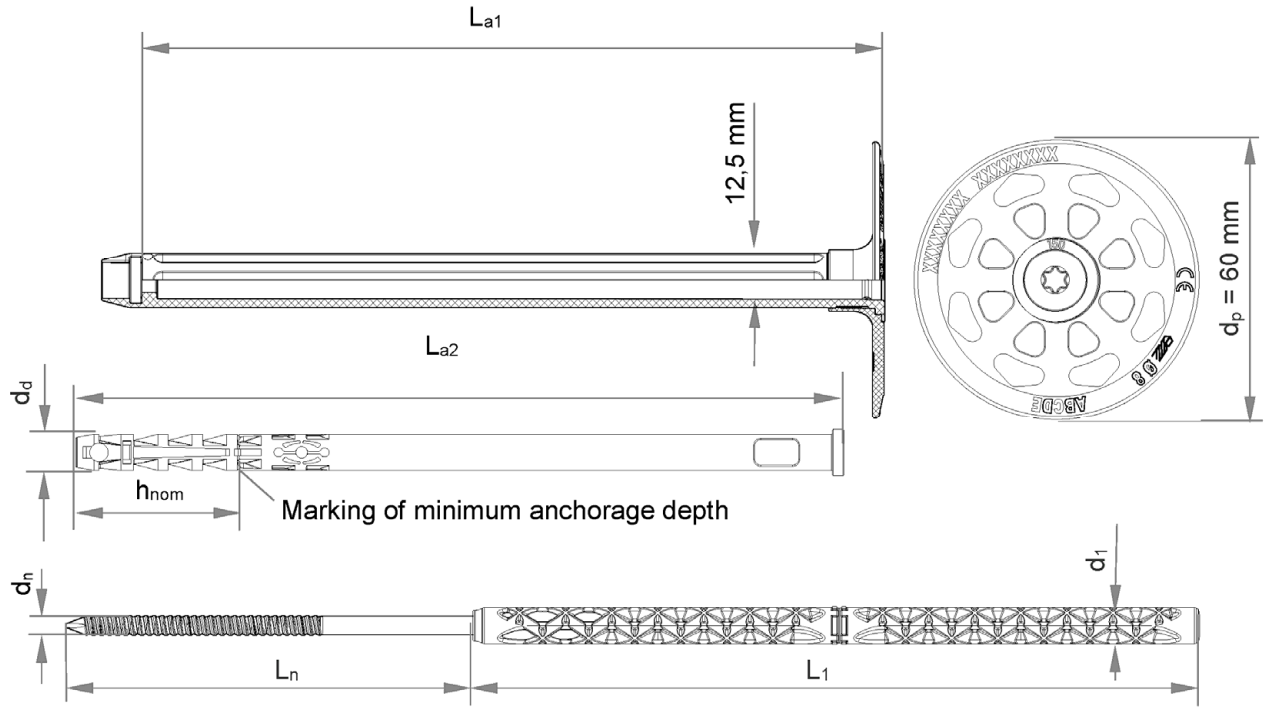
CNplus CARBON 8 / 330 – 390



Marking:
Brand, name and size of anchor, diameter, base material groups, optional markings see drawing of anchor plate, example
CNplus CARBON 8
ABCDE

Various length of the anchors are possible.

e.g. for CNplus CARBON 8 / 330 – 390:
330 mm ≥ L_{a1} + L_{a2} ≤ 390 mm
L_a = L_{a1} + L_{a2} = L_n + 159,5 mm

Table A8.1: Dimensions CNplus CARBON 8 / 330 – 390

Anchor type	Shaft	Anchor sleeve			Specific compound nail			
	L_{a1} [mm]	d_d [mm]	h_{nom} [mm]	L_{a2} [mm]	d_n [mm]	L_n [mm]	L_1 [mm]	d_1 [mm]
CNplus CARBON 8 / 330 – 390	161	8	35/55[1)]	167 - 247	4,3	(L_{a1}+L_{a2}) – 159,5	157,5	8

[1)] Only valid for base material group “D” and “E”.

Determination of maximum thickness of insulation: maximum h_D = L_a – h_{nom} – t_{tol}

e.g. for CNplus CARBON 8x330:
L_a = 328 mm, h_{nom} = 35 mm, t_{tol} = 10 mm

maximum h_D = 328 – 35 – 10 = 283 mm
→ recommended h_D = 280 mm

Figures not to scale

CN CARBON 8 | CN CARBON 8 R | CNplus CARBON 8	Annex A 8
Product description Dimensions CNplus CARBON 8 / 330 – 390	

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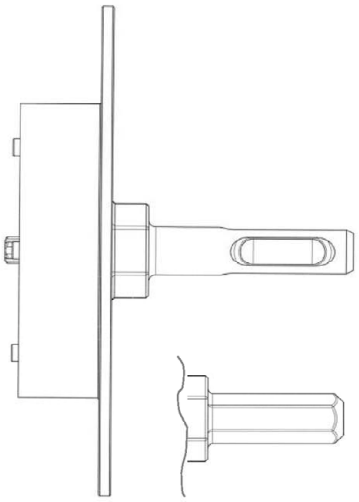
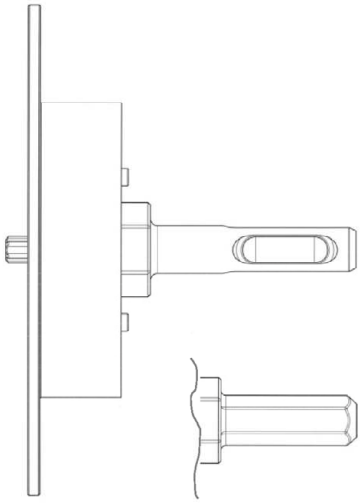
Setting tool with SDS adapter or hexagonal adapter for CNplus CARBON 8

Countersunk setting[1)]

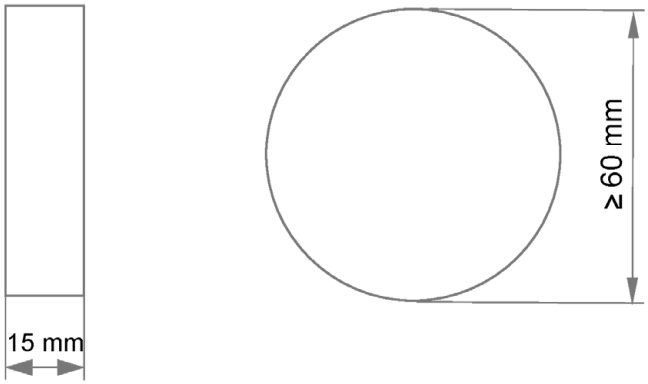


Optional: plain surface setting



[1)] Alternatively, it is possible to mill the insulation material with a standard, market-available milling tool.

Cap



Figures not to scale

CN CARBON 8 | CN CARBON 8 R | CNplus CARBON 8	Annex A 9
Product description Setting tool and dimensions of cap for CNplus CARBON 8	

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Table A10.1: Materials

Designation	Material
Anchor sleeve	PP, colour: grey
Shaft CN CARBON 8 / 250 – 390 or CN CARBON 8 R / 250 – 310 or CNplus CARBON 8 / 250 – 390	PA6 GF, colour: grey
Plastic cylinder CN CARBON 8 / 250 – 390 or CN CARBON 8 R / 250 – 310	PA6 GF
Specific nail CN CARBON 8 / 250 – 390 or CN CARBON 8 R / 250 – 310	Galvanised steel witht Zn5/Ag or Zn5/An as per EN ISO 4042
Specific cpompound nail CN CARBON 8 / 110 – 230 or CNplus CARBON 8 / 110 – 230 or CNplus CARBON 8 / 250 – 390	PA6 GF (plastic part of compound nail) with galvanised steel Zn5/Ag or Zn5/An as per EN ISO 4042
Cap	Polystyrene; mineral wood, soft wood fibre
Anchor plate / slip-on plate	PA6 GF, colour: grey, yellow, red, orange, green, blue, mocca-latte, black

Drawing of the slip-on plate (e.g. DT 140)

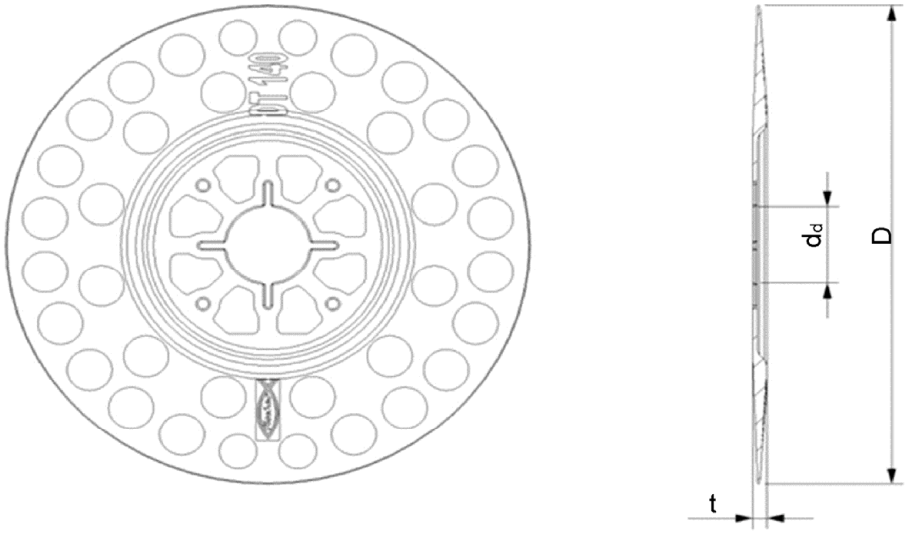

Table A10.2: Slip-on plate, dimensions and material

Slip-on plate	D [mm]	d_{dt} [mm]	t [mm]
DT 90 / 110 / 140	90 / 110 / 140	22,5	3,9

Figures not to scale

CN CARBON 8 | CN CARBON 8 R | CNplus CARBON 8	Annex A 10
Product description Material, Slip-on plate dimensions and material combined with CN CARBON 8, CN CARBON 8 R and CNplus CARBON 8	

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Specifications of intended use

Anchorages subject to:

- The anchor may only be used for transmission of wind suction loads and shall not be used for the transmission of dead loads of the external thermal insulation composite system (ETICS).

Base materials:

- Compacted normal weight concrete without fibres, strength classes ≥ C12/15 (base material group “A”), in accordance with EN 206, see Annex C 1 and C 2.
- Solid brick masonry (base material group “B”) as per EN 771-1, EN 771-2 or EN 771-3, see Annex C 1 and C 2.
- Hollow brick masonry (base material group “C”), as per EN 771-1, EN 771-2 or EN 771-3, see Annex C 1 and C 2.
- Prefabricated reinforced components of lightweight aggregate concrete with open structure (base material group ”D“) as per EN 1520, see Annex C 1 and C 2..
- Unreinforced autoclaved aerated concrete (base material group “E”) as per EN 771-4, see Annex C 1 and C 2.
- For other comparable base materials of the base material group “A”, “B”, “C”, “D” and “E” the characteristic resistance of the anchor may be determined by job site tests in accordance with EOTA Technical Report TR 051.

Temperature Range:

- 0 °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 designed under the responsibility of an engineer experienced in anchorages and masonry work with the partial safety factors for material related resistances γ_M = 2,0 and for action loads γ_F = 1,5 in absence of other national regulations.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchors is indicated on the design drawings.
- Fasteners are only to be used for multiple fixings of external thermal insulation composite system.

Installation:

- Drilling method according to Annex C 1 and C 2.
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters on the site.
- Installation temperature from 0 °C to + 40 °C.
- Exposure to UV due to solar radiation of the anchor not protected by rendering ≤ 6 weeks.

CN CARBON 8 | CN CARBON 8 R | CNplus CARBON 8	Annex B 1
Intended Use Specification	

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Table B2.1: Installation parameters for base material groups "A" concrete, "B" solid bricks, "C" hollow or perforated bricks, "D" lightweight aggregate concrete and "E" autoclaved aerated concrete – flush mounting

Anchor type				CN CARBON 8 CN CARBON 8 R CNplus CARBON 8
Nominal drill hole diameter	d_0	=	[mm]	**8**
Cutting diameter of drill bit	d_{cut}	≤	[mm]	**8,45**
Depth of drilled hole to deepest point	h_1	≥	[mm]	**45/55[1]/65[2]**
Overall plastic anchor embedment depth in the base material	h_{nom}	≥	[mm]	**35/45[1]/55[2]**

[1] Only CNplus CARBON valid for weather shells (thin conrete slabs) : 35 mm ≤ h_{nom} ≤ 45 mm.
[2] CN CARBON 8 | CN CARBON 8 R : Only valid for base material group "E".
CNplus CARBON 8: Only valid for base material group "D" and "E".

Table B2.2: Installation parameters for base material groups "A" concrete, "B" solid bricks, "C" hollow or perforated bricks, "D" lightweight aggregate concrete and "E" autoclaved aerated concrete – countersunk mounting

Anchor type				CNplus CARBON 8
Nominal drill hole diameter	d_0	=	[mm]	**8**
Cutting diameter of drill bit	d_{cut}	≤	[mm]	**8,45**
Depth of drilled hole to deepest point	h_1	≥	[mm]	**60/70[1]/80[2]**
Overall plastic anchor embedment depth in the base material	h_{nom}	≥	[mm]	**35/45[1]/55[2]**

[1] Valid for weather shell (thin concrete slabs): 35 mm ≤ hnom ≤ 45 mm.
[2] Only valid for base material group "D" and "E".

Table B2.3: Minimum thickness of member, edge distances and spacing in all regulated base material groups

Anchor type				CN CARBON 8 CN CARBON 8 R CNplus CARBON 8
Minimum thickness of member	h_{min}	=	[mm]	100
Minimum spacing	s_{min}	=	[mm]	100
Minimum edge distance	c_{min}	=	[mm]	100

Scheme of edge distances and spacing
for base material group "A", concrete, group "B" solid bricks, group "C" hollow or perforated masonry, group "D" lightweight aggregate concrete, group "E" autoclaved aerated concrete

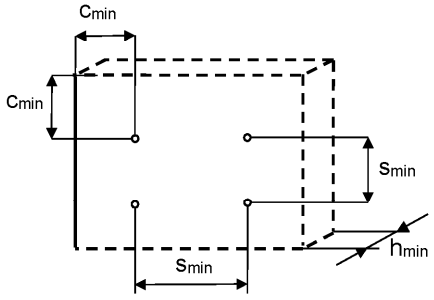


Figure not to scale

CN CARBON 8 | CN CARBON 8 R | CNplus CARBON 8

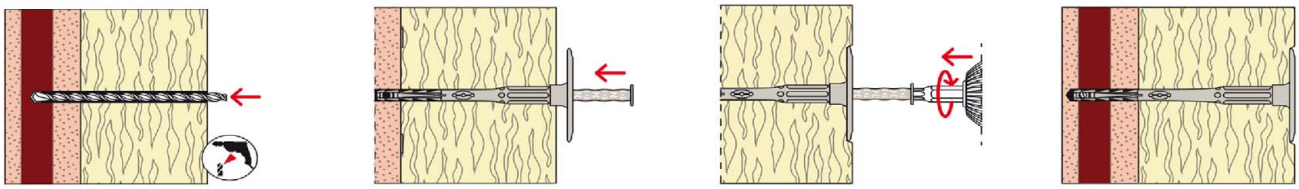
Intended Use
Installation parameters
Minimum thickness of member, edge distances and spacing

Annex B 2

Deutsches Institut für Bautechnik DIBt

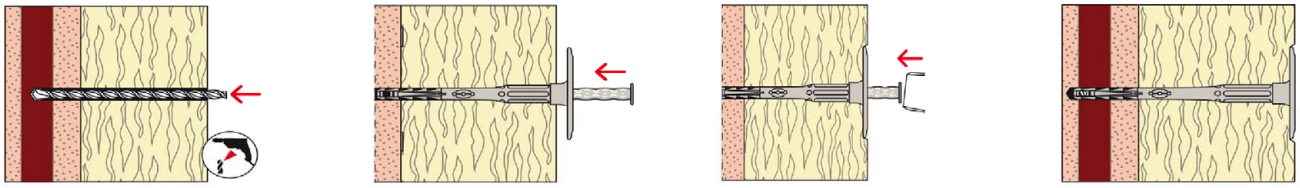
Installation instruction

Setting of anchor (plain surface setting) by machine / CNplus CARBON 8



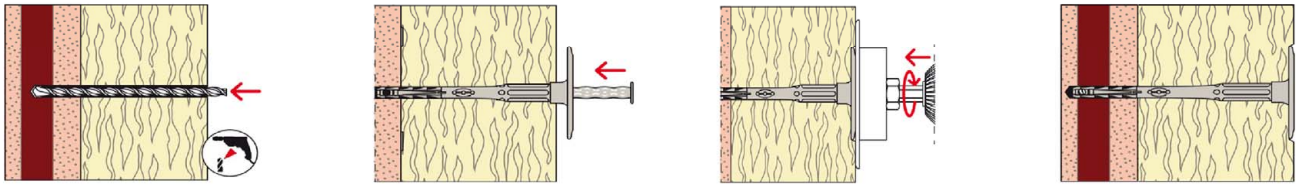
1. Drill hole by corresponding drilling method
2. Insert anchor manually
3. Set anchor by machine
4. Correctly installed anchor

Setting of anchor (plain surface setting) by hammer / CN CARBON 8 | CN CARBON 8 R | CNplus CARBON 8



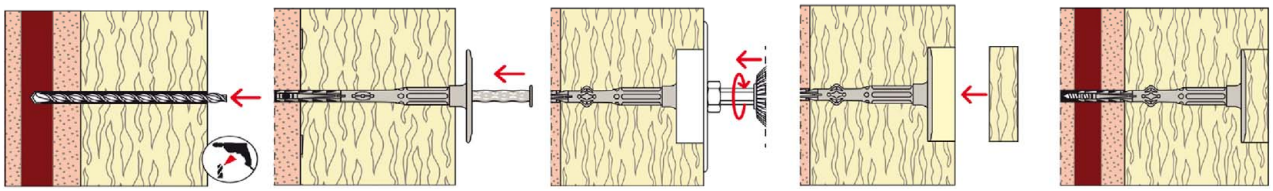
1. Drill hole by corresponding drilling method
2. Insert anchor manually
3. Set anchor by hammer blows
4. Correctly installed anchor

Setting of anchor (plain surface setting) by setting tool / CNplus CARBON 8



1. Drill hole by corresponding drilling method
2. Insert anchor manually
3. Set anchor by setting tool with the machine
4. Correctly installed anchor

Setting of anchor (countersunk mounting) by setting tool / CNplus CARBON 8



1. Drill hole by corresponding drilling method
2. Insert anchor manually
3. Set anchor by setting tool with the machine
4. Put on cap
5. Correctly installed anchor

CN CARBON 8 | CN CARBON 8 R | CNplus CARBON 8	Annex B 3
Intended Use Installation instruction	

Deutsches Institut für Bautechnik DIBt

Table C1.1: Characteristic resistance N_{Rk} to tension loads for single anchor CN CARBON 8 and CN CARBON 8 R

Base material	Group	Bulk density ρ [kg/dm³]	Mean compressive strength / minimum compressive strength single brick as per EN 771[5] [N/mm²]	Remarks	Drilling method [1]	Characteristic resistance to tension loads N_{Rk} [kN]
Concrete, C12/15 - C50/60 as per EN 206	A	-	-	-	H	**0,90**
Solid Clay bricks, Mz as per EN 771-1	B[2]	≥ 2,0	15/12	-	H	**0,90**
Calcium silicate solid bricks, KS as per EN 771-2	B[2]	≥ 1,8	15/12	-	H	**0,90**
Solid concrete blocks, Vbn as per EN 771-3	B[2]	≥ 2,0	25/20	-	H	**0,75**
Lightweight concrete blocks, Vbl as per EN 771-3	B[2]	≥ 1,4	10/8	-	H	**0,60**
Vertically perforated clay bricks, HLz as per EN 771-1	C[3]	≥ 1,0	15/12	Exterior web thickness ≥ 15 mm.	R	**0,60**
Hollow calcium silicate brick, KSL as per EN 771-2	C[3]	≥ 1,4	15/12	Exterior web thickness ≥ 23 mm.	H	**0,50**
			25/20			**0,75**
Lightweight concrete hollow blocks, Hbl as per EN 771-3	C[3]	≥ 1,2	12,5/10	Exterior web thickness ≥ 38 mm.	H	**0,60**
Lightweight aggregate concrete, LAC as per EN 1520 / EN 771-3	D[3]	≥ 0,8	7,5/6	Min. thickness of brick h = 100 mm or min. exterior web thickness t = 50 mm.	H	**0,40**
			5/4			**0,60**
Unreinforced autoclaved aerated concrete members, AAC as per EN 771-4	E	> 0,4	7,5/6	-	R	**0,30[4]**
		> 0,6	5/4	-		**0,30[4]**

[1] H = Hammer drilling, R = Rotary drilling.
[2] Vertically perforation ≤ 15%; cross section reduced by perforation vertically to the resting area.
[3] Vertically perforation > 15 % and ≤ 50 %, cross section reduced by perforation vertically to the resting area.
[4] Only valid for $h_{nom} \geq 55$ mm.
[5] The compressive strength of the single brick must not be less than 80% of the mean compressive strength.

CN CARBON 8 | CN CARBON 8 R | CNplus CARBON 8

Performances
Characteristic resistance to tension load CN CARBON 8 and CN CARBON 8 R

Annex C 1

Deutsches Institut für Bautechnik DIBt

Table C2.1: Characteristic resistance N_{Rk} to tension loads for single anchor CNplus CARBON 8

Base material	Group	Bulk density ρ [kg/dm³]	Mean compressive strength / minimum compressive strength single brick as per EN 771[5] [N/mm²]	Remarks	Drilling method [1]	Characteristic resistance to tension loads N_{Rk} [kN]
Concrete, C12/15 - C50/60 as per EN 206	A	-	-	-	H	**0,90**
Weather resistant concrete shell ≥ C20/25 as per EN 206	A	-	-	h ≥ 42 mm; t_{fix} ≥ 35mm.	H	**0,90**
Solid clay bricks, Mz as per EN 771-1	B[2]	≥ 1,8	25/20	-	H	**0,90**
Calcium silicate solid bricks, KS as per EN 771-2	B[2]	≥ 1,8	25/20	-	H	**0,90**
Solid concrete blocks, Vbn as per EN 771-3	B[2]	≥ 2,0	25/20	-	H	**0,90**
Lightweight concrete blocks, Vbl as per EN 771-3	B[2]	≥ 1,6	12,5/10	-	H	**0,75**
Vertically perforated clay bricks, Hlz as per EN 771-1	C[3]	≥ 1,6	15/12	-	R	**0, 50**
		≥ 1,0	60/48	-		**0,75**
Hollow calcium silicate brick, KSL as per EN 771-2	C[3]	≥ 1,4	20/16	Exterior web thickness ≥ 16 mm.	H	**0,50**
Lightweight concrete hollow blocks, Hbl as per EN 771-2	C[3]	≥ 1,2	12,5/10	Exterior web thickness ≥ 38 mm.	H	**0,60**
Lightweight aggregate concrete, LAC as per EN 1520 / EN 771-3	D[3]	≥ 0,9	7,5/6	Minimum thickness of brick h = 100 mm or Minimum exterior web thickness t = 50 mm.	H	**0,40**[4]
Unreinforced autoclaved aerated concrete members, AAC as per EN 771-4	E	> 0,4	5/4	-	R	**0,30**[4]

[1] H = Hammer drilling, R = Rotary drilling.
[2] Vertically perforation ≤ 15%; cross section reduced by perforation vertically to the resting area.
[3] Vertically perforation > 15 % and ≤ 50 %, cross section reduced by perforation vertically to the resting area.
[4] Only valid for h_{nom} ≥ 55 mm.
[5] The compressive strength of the single brick must not be less than 80% of the mean compressive strength.

CN CARBON 8 | CN CARBON 8 R | CNplus CARBON 8

Performances
Characteristic resistance to tension load CNplus CARBON 8

Annex C 2

Deutsches Institut für Bautechnik DIBt

Table C3.1: Point thermal transmittance according to EOTA Technical Report TR 025
CN CARBON 8 and CN CARBON 8 R

Anchor type	Thickness of insulation material h_D [mm]	Point thermal transmittance χ [W/K]
CN CARBON 8 / 110 - 230	60 - 80	0,001
	> 80 - 180	0,000
CN CARBON 8 / 250-350	200 - 300	0,000
CN CARBON 8 / 370-390	> 300 - 340	0,001
CN CARBON 8 R / 250 - 310	200 - 260	0,001

Table C3.2: Point thermal transmittance according to EOTA Technical Report TR 025
CNplus CARBON 8 – countersunk setting

Thickness of insulation material h_D [mm]	Point thermal transmittance χ [W/K] Base material group				
	A	B	C	D	E
60	0,001	0,001	0,001	0,001	0
80					0,001
100	0,002	0,002			
120			0,002		
140				0,002	
160					
180				0,001	
200			0,001		
220					
240					
260				0	0
280	0,001	0,001			
300				0,001	
320					
340				1)	1)

1) No performance assessed

CN CARBON 8 | CN CARBON 8 R | CNplus CARBON 8	Annex C 3
Performances Point thermal transmittance	

Deutsches Institut für Bautechnik DIBt

Table C4.1: Point thermal transmittance according to EOTA Technical Report TR 025
CNplus CARBON 8– countersunk setting

Thickness of insulation material h_D [mm]	Point thermal transmittance χ [W/K] Base material group				
	A	B	C	D	E
80	0,001	0	0	0	0
100		0,001	0,001	0,001	
120					0,001
140					
160	0,002				
180		0,002			
200	0,001	0,001			
220					
240					
260				0	0
280	0	0	0		
300	0,001	0,001			
320			0,001		
340				1)	1)

1) No performance assessed

Table C4.2: Plate stiffness according to EOTA Technical Report TR 026

Anchor type	Max. size of the anchor plate d_p [mm]	Load resistance of the anchor plate [kN]	Plate stiffness c [kN/mm]
CN CARBON 8 | CN CARBON 8 R CNplus CARBON 8	60	1,7	0,6

Deutsches Institut für Bautechnik DIBt

Table C5.1: Displacements of CN CARBON 8 and CN CARBON 8 R

Base material	Mean compressive strength / minimum compressive strength single brick as per EN 771[1)] [N/mm²]	Tension load N [kN]	Displace-ments $\Delta\delta_N$ [mm]
Concrete, C12/15 - C50/60 as per EN 206	-	0,30	< 0,30
Solid Clay bricks, Mz as per EN 771-1	15/12	0,30	< 0,50
Calcium silicate solid bricks, KS as per EN 771-2	15/12	0,30	< 0,30
Solid concrete blocks, Vbn as per EN 771-3	25/20	0,25	< 0,30
Lightweight concrete blocks, Vbl as per EN 771-3	10/8	0,20	< 0,20
Vertically perforated clay, HLz bricks as per EN 771-1	15/12	0,20	< 0,20
Hollow calcium silicate brick, KSL as per EN 771-2	15/12	0,25	< 0,30
	25/20	0,15	< 0,20
Lightweight concrete hollow blocks, Hbl as per EN 771	12,5/10	0,20	< 0,20
Lightweight aggregate concrete, LAC as per EN 1520 / EN 771-3	5/4	0,13	< 0,30
	7,5/6	0,20	< 0,30
Autoclaved aerated concrete members, AAC as per EN 771-4	5/4	0,10	< 0,30
	7,5/6	0,13	< 0,20

[1)] The compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C5.2: Displacements of CNplus CARBON 8

Base material	Mean compressive strength / minimum compressive strength single brick as per EN 771[1)] [N/mm²]	Tension load N [kN]	Displace-ments $\Delta\delta_N$ [mm]
Concrete, C12/15 - C50/60 as per EN 206	-	0,30	< 0,10
Weather resistant concrete shell ≥ C20/25 as per EN 206	-	0,30	< 0,10
Solid Clay bricks, Mz as per EN 771-1	25/20	0,30	< 0,20
Calcium silicate solid bricks, KS as per EN 771-2	25/20	0,30	< 0,20
Solid concrete blocks, Vbn as per EN 771-3	25/20	0,30	< 0,20
Lightweight concrete blocks, Vbl as per EN 771-3	12,5/10	0,25	< 0,10
Vertically perforated clay, HLz bricks as per EN 771-1	15/12	0,17	< 0,10
Hollow calcium silicate brick, KSL as per EN 771-2	60/48	0,25	< 0,20
Hollow calcium silicate bricks, KSL as per EN 771-2	20/16	0,17	< 0,10
Lightweight concrete hollow blocks, Hbl as per EN 771	12,5/10	0,20	< 0,10
Lightweight aggregate concrete, LAC as per EN 1520 / EN 771-3	7,5/6	0,13	< 0,20
Autoclaved aerated concrete members, AAC as per EN 771-4	5/4	0,10	< 0,10

[1)] The compressive strength of the single brick must not be less than 80% of the mean compressive strength.

CN CARBON 8 | CN CARBON 8 R | CNplus CARBON 8	**Annex C 5**
Performances Displacements	