

## European Technical Assessment

## ETA-14/0459 of 27/12/2014

*English translation prepared by CSTB - Original version in French language*

### General Part

**Nom commercial**  
*Trade name*

**CA-PLUS**

**Famille de produit**  
*Product family*

**Cheville métallique à expansion par déformation contrôlée,  
pour usage multiple et pour applications non structurales  
dans le béton**

***Deformation-controlled expansion anchor made of  
galvanized steel for multiple use and for non-structural  
applications in concrete***

**Titulaire**  
*Manufacturer*

Sympafix BV  
Fluorietweg 25E  
1812RR Alkmaar  
The Netherlands

**Usine de fabrication e**  
*Manufacturing plants*

3 MT

**Cette evaluation contient:**  
*This Assessment contains*

8 pages incluant 3 annexes qui font partie intégrante de cette  
évaluation  
***8 pages including 3 annexes which form an integral part of  
this assessment***

**Base de l'ETE**  
*Basis of ETA*

ETAG 001, Version April 2013, utilisée en tant que EAD  
***ETAG 001, Edition April 2013 used as EAD***

**Cette evaluation remplace:**  
*This Assessment replaces*

*Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such. Communication of this European Technical Assessment, including transmission by electronic means, shall be in full. However, partial reproduction may be made, with the written consent of the issuing Technical Assessment Body. Any partial reproduction has to be identified as such.*

## Specific Part

### 1 Technical description of the product

The SYMPAFIX CA-PLUS anchor is an anchor made of zinc electroplated steel which is placed into a drilled hole and anchored by deformation-controlled expansion.

The illustration and the description of the product are given in Annexes A.

### 2 Specification of the intended use

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

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

### 3 Performance of the product

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

Not relevant.

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

Essential characteristic	Performance
Reaction to fire	Anchorage satisfy requirements for Class A1
Resistance under fire acc. ETAG001, Annex C	See Annex C 2

#### 3.3 Hygiene, health and the environment (BWR 3)

Regarding dangerous substances contained in this European technical approval, there may be requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Directive, these requirements need also to be complied with, when and where they apply.

#### 3.4 Safety in use (BWR 4)

Essential characteristic	Performance
Design resistance acc. ETAG001, Annex C	See Annex C 1
Displacements	See Annex C 1

#### 3.5 Protection against noise (BWR 5)

Not relevant.

#### 3.6 Energy economy and heat retention (BWR 6)

Not relevant.

#### 3.7 Sustainable use of natural resources (BWR 7)

For the sustainable use of natural resources no performance was determined for this product.

#### 3.8 General aspects relating to fitness for use

Durability and Serviceability are only ensured if the specifications of intended use according to Annex B 1 are kept.

**4 Assessment and verification of constancy of performance (AVCP)**

According to the Decision 96/582/EC of the European Commission<sup>1</sup>, as amended, the system of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) given in the following table apply.

Product	Intended use	Level class	or	System
Metal anchors for use in concrete	For fixing and/or supporting to concrete, structural elements (which contributes to the stability of the works) or heavy units	—		2+

**5 Technical details necessary for the implementation of the AVCP system**

Technical details necessary for the implementation of the Assessment and verification of constancy of performance (AVCP) system are laid down in the control plan deposited at Centre Scientifique et Technique du Bâtiment.

The manufacturer shall, on the basis of a contract, involve a notified body approved in the field of anchors for issuing the certificate of conformity CE based on the control plan.

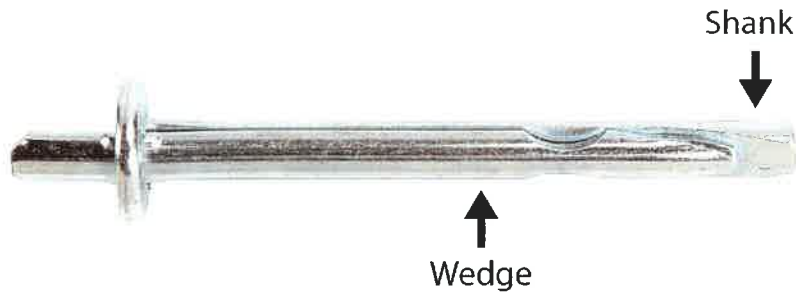
**The original French version is signed by**

Charles Baloché  
Technical Director

---

<sup>1</sup> Official Journal of the European Communities L 254 of 08.10.1996

**Wedge nail CA-PLUS:**



**Marking on the bolt:**

CA-PLUS

**Different parts of the anchor:**

**Table 1: Materials**

Part	Designation	Material	Protection
1	Shank	C-Steel acc. to EN ISO 10263-2	Zinc plated > 5 µm
2	Wedge	C-Steel acc. to EN ISO 10263-2	Zinc plated > 5 µm

Sympafix Wedge nail CA-PLUS

Product description  
 Installation condition

Annex A1

## Specifications of intended use

### Anchorage subject to:

- Static, quasi-static and fire.

### Base materials:

- Cracked concrete and non-cracked concrete (multiple use)
- Reinforced or unreinforced normal weight concrete of strength classes C 20/25 at least to C50/60 at most according to ENV 206: 2000-12.

### Use conditions (Environmental conditions):

- Structures subject to dry internal conditions.

### Design:

- The anchorages are designed in accordance with the method C of ETAG001 Annex C "Design Method for Anchorages" under the responsibility of an engineer experienced in anchorages and concrete work.
- For application with resistance under fire exposure the anchorages are designed in accordance with method given in TR020 "Evaluation of Anchorage in Concrete concerning Resistance to Fire".
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings.
- The anchor may only be used if in the design and installation specifications for the fixture the excessive slip or failure of one anchor will not result in a significantly violation of the requirements on the fixture in the serviceability and ultimate state
- The anchor is to be used only for multiple use for non-structural applications, the definition of multiple use according to the Member States is given in the informative [Annex 1 of ETAG 001, Part 6](#).

### Installation:

- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Use of the anchor only as supplied by the manufacturer without exchanging the components of an anchor.
- Anchor installation in accordance with the manufacturer's specifications and drawings and using the appropriate tools.
- Effective anchorage depth, edge distances and spacing not less than the specified values without minus tolerances.
- Hole drilling by hammer drill.
- Cleaning of the hole of drilling dust.
- In case of aborted hole, drilling of new hole at a minimum distance of twice the depth of the aborted hole, or smaller distance provided the aborted drill hole is filled with high strength mortar and no shear or oblique tension loads in the direction of aborted hole.

**Sympafix wedge nail CA-PLUS**

**Intended Use**  
Specifications

**Annex B2**

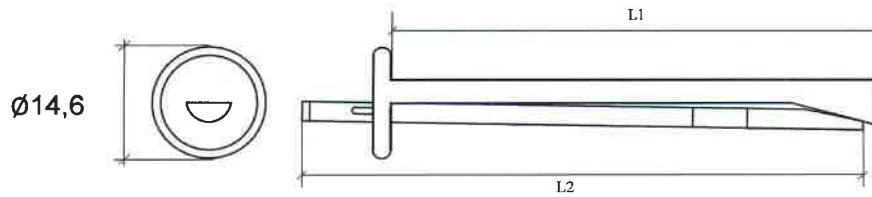
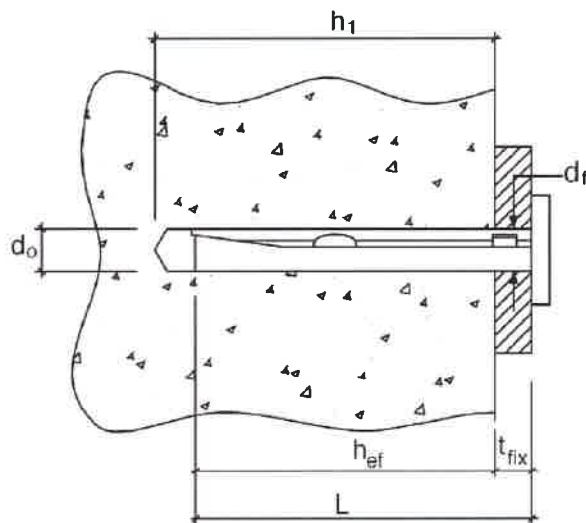


Table 2: Anchor dimensions

		6/35	6/65
Length of wedge L2	[mm]	42,5	72,5
Length of shank L1	[mm]	35	65
Max fixture thickness $t_{fix}$	[mm]	3,0	33,0

Table 3: Installation data

			6/35	6/65
Drill hole diameter	$d_{cut}$	[mm]	$\leq 6,40$	$\leq 6,40$
Drill hole depth	$h_1$	[mm]	40	40
Embedment depth	$h_{ef}$	[mm]	32	32
Diameter through hole fixture	$d_f$	[mm]	7,0	7,0
Min. member thickness	$h_{min}$	[mm]	80	80
Minimum edge distance	$c_{cr}$	[mm]	150	150
Minimum spacing	$s_{cr}$	[mm]	200	200



Sympafix wedge nail CA-PLUS

Intended Use  
 Installation parameters

Annex B2

**Table 4: Characteristic values for tension loads in case of static and quasi static loading for design method C acc. ETAG001, Annex C**

<b>Sympafix CA-PLUS</b>				
<b>Tension and shear</b>			<b>6/35</b>	<b>6/65</b>
Char. resistance (C20/25 to C50/60)	$F_{Rk}$	[kN]	2,5	2,5
Partial safety factor	$\gamma_M^{1)}$	[-]	1,8 <sup>2)</sup>	1,8 <sup>2)</sup>
Design value of resistance	$F_{Rd}$	[kN]	1,4	1,4
Char. spacing (design method C)	$s_{cr}$	[mm]	200	200
Char. edge distance (design method C)	$c_{cr}$	[mm]	150	150
<b>Shear load with lever arm</b>				
Characteristic bending moment	$M_{Rk,s}^0$ <sup>3)</sup>	[Nm]	5,5	5,5
Partial safety factor	$\gamma_M^{1)}$	[-]	1,67	1,67
Design value	$M_{Rd,s}^0$	[Nm]	3,3	3,3
<b>Displacements</b>				
Applied load	$F$	[kN]	1,0	1,0
Displacements at short term	$\delta_{F0}$	[mm]	1,41	1,41
Displacements at long term	$\delta_{F\infty}$	[mm]	0,26	0,26

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

<sup>2)</sup> The value contains an installation safety factor  $\gamma_2=1.2$

<sup>3)</sup> Characteristic bending moment  $M_{Rk,s}^0$  for equation 5.5 in ETAG001 Annex C

**Sympafix wedge nail CA-PLUS**

**Annex C1**

Design according to ETAG001, Annex C

Design values - Displacements

**Table 5:** Characteristic values under fire exposure in concrete C20/25 to C50/60 in any load direction without lever arm, Design method B and C

Fire resistance class	Sympafix CA-PLUS			6/35	6 /65
<b>Tension and shear <sup>1)</sup></b>					
R 30	Characteristic resistance	$F_{Rk,fi}^{2)}$	[kN]	0,14	0,14
R 60	Characteristic resistance	$F_{Rk,fi}^{2)}$	[kN]	0,13	0,13
R 90	Characteristic resistance	$F_{Rk,fi}^{2)}$	[kN]	0,10	0,10
R 120	Characteristic resistance	$F_{Rk,fi}^{2)}$	[kN]	0,07	0,07
<b>Shear load with lever arm <sup>1)</sup></b>					
R 30	Char. bending resistance	$M_{Rk,fi}^{2)}$	[Nm]	0,14	0,14
R 60	Char. bending resistance	$M_{Rk,fi}^{2)}$	[Nm]	0,12	0,12
R 90	Char. bending resistance	$M_{Rk,fi}^{2)}$	[Nm]	0,10	0,10
R 120	Char. bending resistance	$M_{Rk,fi}^{2)}$	[Nm]	0,07	0,07

- 1) In case of fire attack from more than one side, the edge distance shall be  $\geq 300\text{mm}$   
 2) In absence of other national regulations the partial safety factor for resistance under fire exposure  $\gamma_{M,fi} = 1,0$  is recommended

Sympafix wedge nail CA-PLUS

Design according to **ETAG001, Annex C**  
 Characteristic resistance under fire exposure

Annex C1