



European Technical Assessment

**ETA-23/0065
of 04/11/2024**

English translation prepared by CSTB - Original version in French language

General Part

Technical Assessment Body issuing the European Technical Assessment:

Centre Scientifique et Technique du Bâtiment (CSTB)

Trade name:	CRET serie 100 / CRET serie 100V
Product family:	Dowels for structural joints under static and quasi static loading
Manufacturer:	LEVIAT GmbH Liebigstr. 14 40764 Langenfeld Germany
Manufacturing plants:	LEVIAT manufacturing plants
This European Technical Assessment contains:	14 pages including 10 pages of 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:	European Assessment Document (EAD) 050019-00-0301 version March 2019 "Dowels for structural joints under static and quasi-static loading"
This Assessment replaces:	-

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Specific Part

1 Technical description of the product

This European Technical Assessment covers the CRET serie 100 and CRET serie 100V dowels for structural joints under static and quasi static loading:

The CRET serie 100 and CRET serie 100V dowels for structural joints consist of a single dowel bar, a sleeve, an anchor body and supplementary reinforcements, according to EAD it belongs to family (iii). The bars and the sleeves are made of stainless steel (Annex A1 to A2).

The CRET serie 100 dowels allow axial movement only. The CRET serie 100V dowels allow axial and lateral traverse movement. The components of the dowel systems are manufactured separately in the factory and assembled on the construction site into an expansion joint between concrete elements. The bar is inserted into a sleeve on the one side of the joint and embedded in concrete on the opposite side. Such setting allows free expansion of the joint and shear stress transmission.

Optionally, the fire protection collars FPC can be part of the dowel. The collar is plugged on the dowel between the concrete elements. In the case of fire the collar will expand and protect the dowel against heating. The dimensions of the fire protection collars are given in Table A4 (Annex A4). Arrangement of fire protection collars is given in Annex A5.

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

2 Specification of the intended use

The performance given in clause 3 are only valid if the dowels are used in compliance with the specifications and conditions given in Annex B1.

Load bearing capacity of dowels with respect to steel failure is given in Annex B2. Load bearing capacity of joint resulting of concrete edge failure is given in Annex B3.

The provisions made in this European Technical Assessment are based on an assumed working life of the products of 50 years, when installed in the works, provided that dowels are subject to appropriate installation, in accordance with the manufacturer's recommendations. The indications given on the working life cannot be interpreted as a guarantee given by the producer or Technical 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 Mechanical resistance and stability (BWR 1)

No.	Essential characteristic	Assessment method (EAD clause)	Type of expression of product performance
1	Resistance to steel failure at ULS	2.2.2	See Annex C1
2	Resistance to concrete edge failure at ULS not influenced by lateral movements of the dowel	2.2.3	See Annex C2
3	Resistance to concrete edge failure at ULS influenced by lateral movements of the dowel	2.2.4	See Annex C2

4	Resistance to concrete edge failure at SLS	2.2.5	See Annex C2
5	Resistance to steel failure at SLS	2.2.6	See Annex C1

3.2 Safety in case of fire (BWR 2)

No.	Essential characteristic	Assessment method (EAD clause)	Type of expression of product performance
1	Reaction to fire	2.2.7	Class A1
2	Resistance to fire	2.2.8	See Annex D3

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

In accordance with the European Assessment Document EAD 050019-00-0301, the following legal bases apply:

- The Decision of the commission N° 2003/639/EC(EU):
The system is 2+ for any use except for uses subject to regulations on reaction to fire performance.
Due to the specific provisions given in EAD clause 2.2.7 only system 4 is relevant with regard to reaction to fire for products covered by the EAD.

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

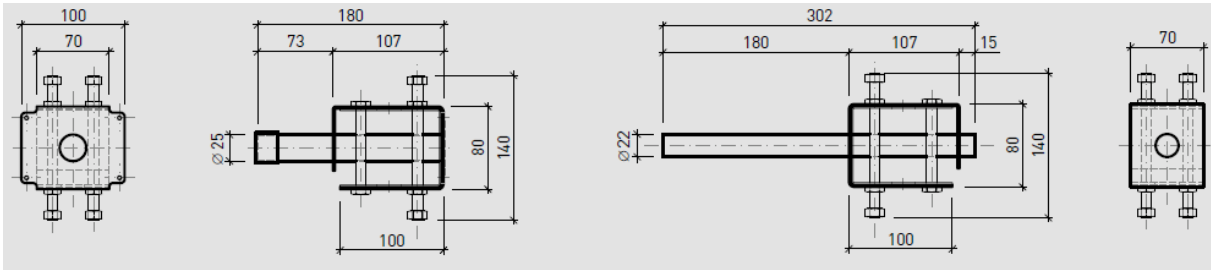
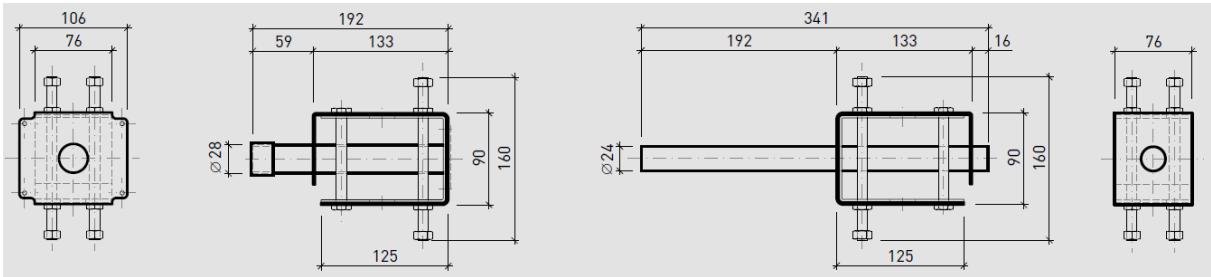
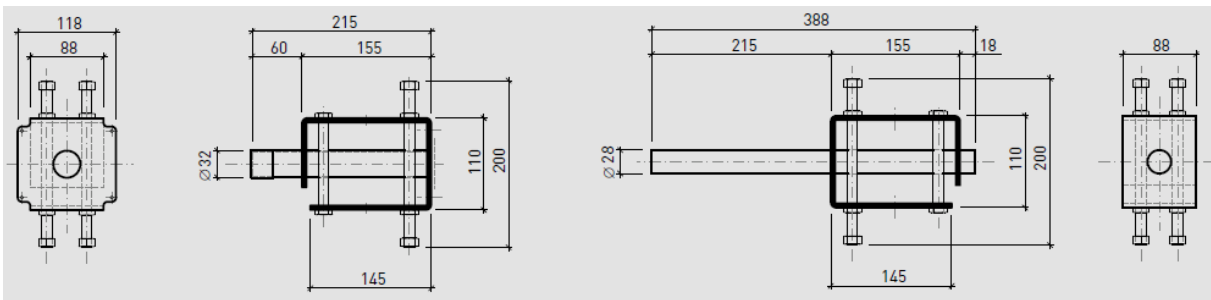
The technical details necessary for the implementation of the system for the Assessment and Verification of Constancy of Performance are laid down in the control plan (confidential part of this European Technical Assessment) deposited at Centre Scientifique et Technique du Bâtiment.

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

The original French version is signed by

Le chef de division, Loïc PAYET

Table A1: Dimensions of CRET serie 100

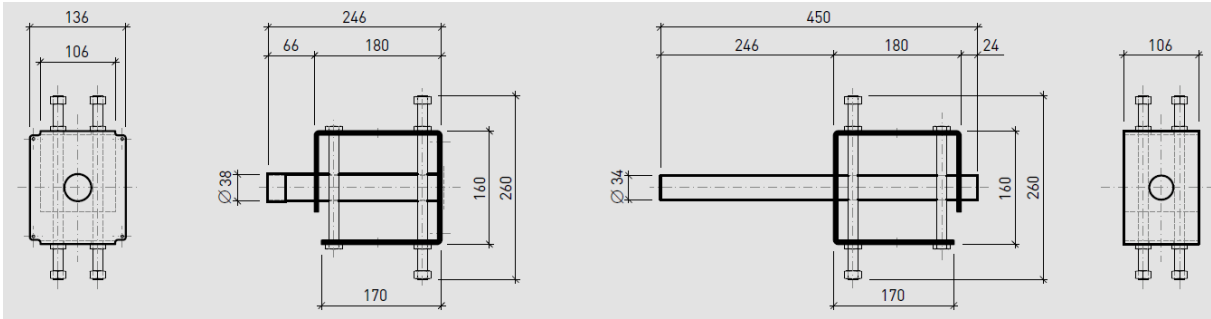
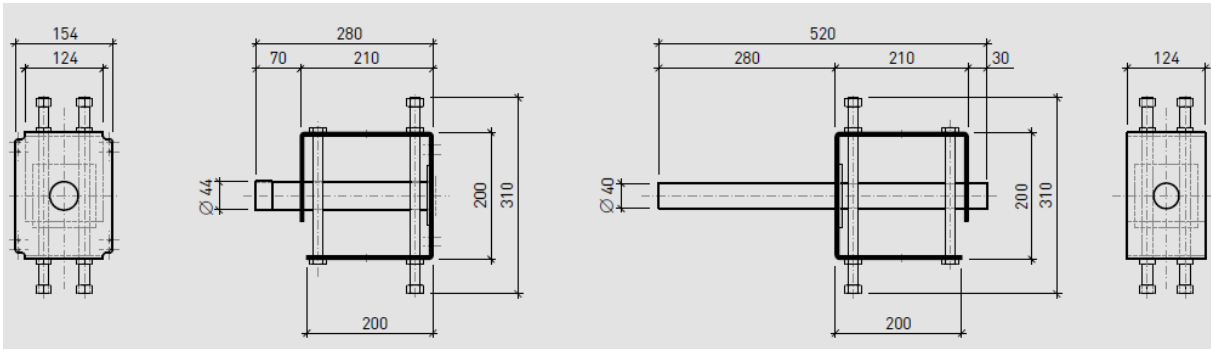
CRET 122	
Illustration (Dimensions in mm)	
	
CRET 124	
Illustration (Dimensions in mm)	
	
CRET 128	
Illustration (Dimensions in mm)	
	

CRET serie 100 / CRET serie 100V

Product description
Dimensions

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Table A2: Dimensions of CRET serie 100

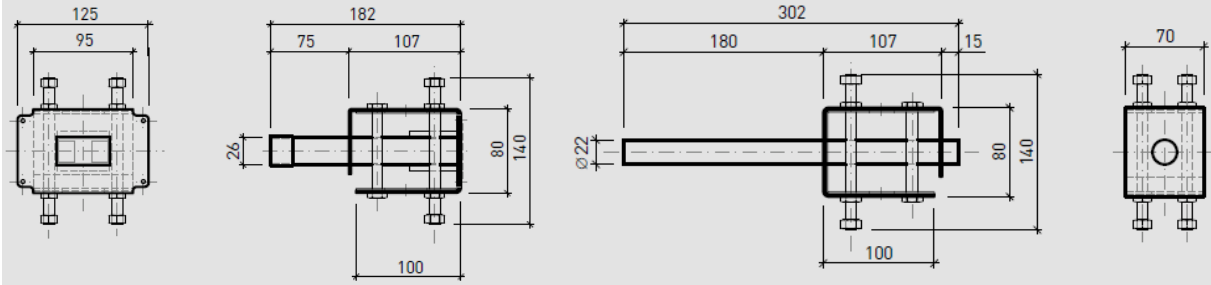
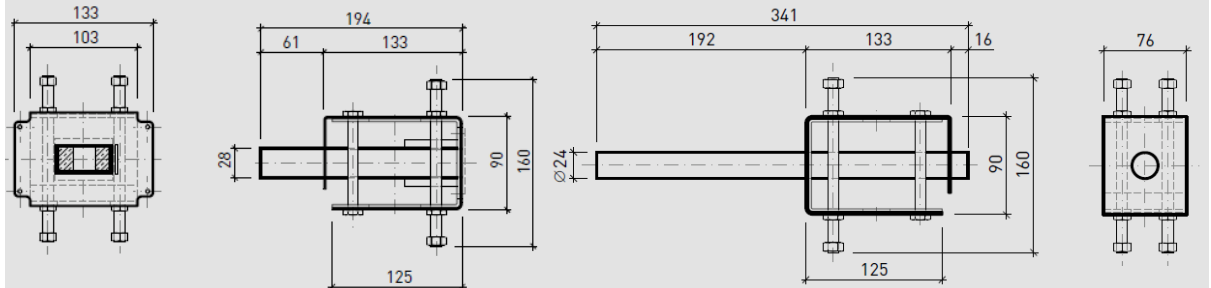
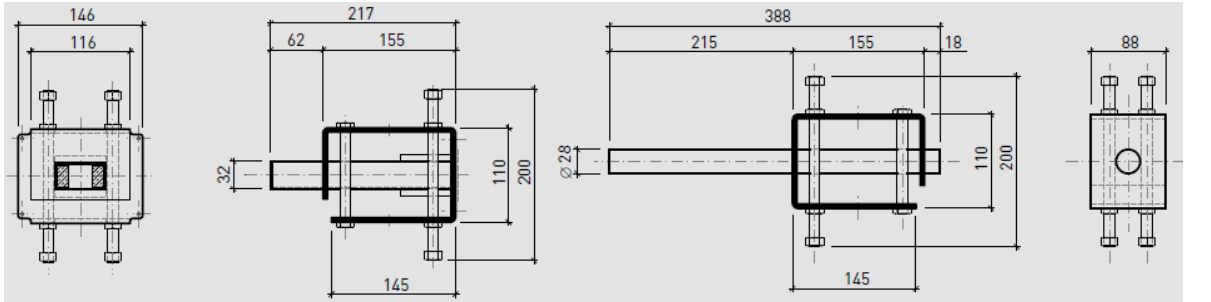
CRET 134	
Illustration (Dimensions in mm)	
	
CRET 140	
Illustration (Dimensions in mm)	
	

CRET serie 100 / CRET serie 100V

Product description
Dimensions

Annex A3
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Table A3: Dimensions of CRET serie 100V

CRET 122V	
Illustration (Dimensions in mm)	
	
CRET 124V	
Illustration (Dimensions in mm)	
	
CRET 128V	
Illustration (Dimensions in mm)	
	

CRET serie 100 / CRET serie 100V

Product description
Dimensions, materials

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Table A4: Selection of the corresponding fire-prevention collars

Type of collar	Fire-prevention collar (t = 20 mm and/or 30 mm)	CRET Type	Dimensions h / b [mm]	Hole diameter [mm]
FPC 20	FPC 20 160x110x20 / Ø22	CRET 122 / CRET 122 V	110 / 160	22
	FPC 20 160x110x20 / Ø25	CRET 124 / CRET 124 V	110 / 160	25
	FPC 20 250x170x20 / Ø30	CRET 128 / CRET 128 V	170 / 250	30
	FPC 20 250x170x20 / Ø35	CRET 134	170 / 250	35
	FPC 20 250x250x20 / Ø42	CRET 140	250 / 250	42
FPC 30	FPC 30 160x110x30 / Ø22	CRET 122 / CRET 122 V	110 / 160	22
	FPC 30 160x110x30 / Ø25	CRET 124 / CRET 124 V	110 / 160	25
	FPC 30 250x170x30 / Ø30	CRET 128 / CRET 128 V	170 / 250	30
	FPC 30 250x170x30 / Ø35	CRET 134	170 / 250	35
	FPC 30 250x250x30 / Ø42	CRET 140	250 / 250	42

The FPC fire protection collars consist of:

- 17,5 mm or 27,5 mm thick mineral fiber panels (class A1 according to EN 13501-1)
- 2,5 mm Promaseal® PL intumescent fire protection plate

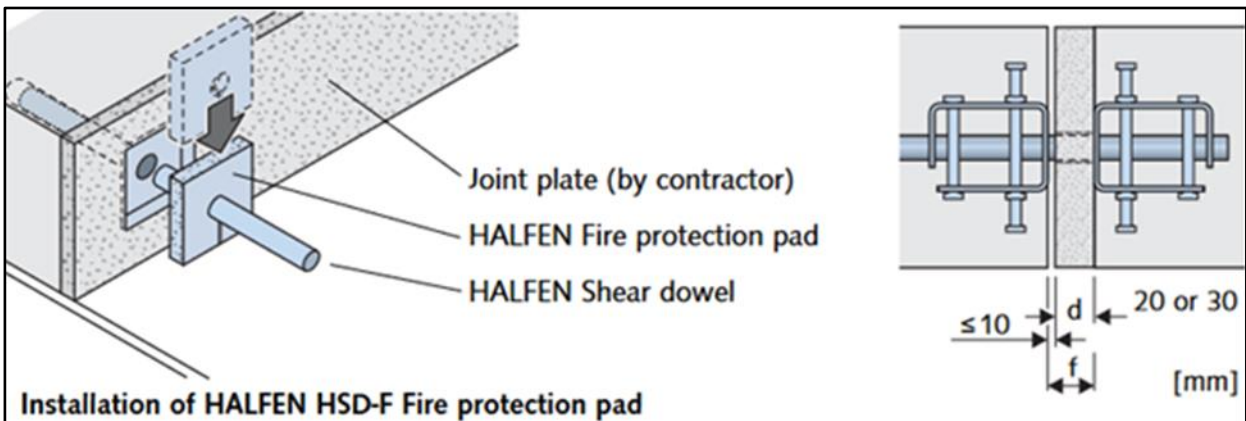
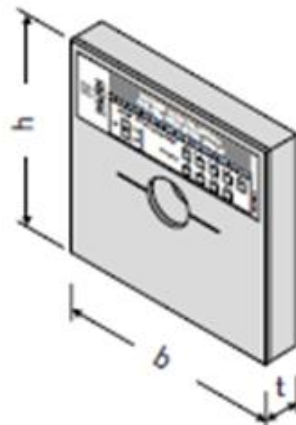
CRET serie 100 / CRET serie 100V

Product description

Dimensions, materials of fire protective collar

Annex A5
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Table A5: Arrangement of fire protection collars



Installation of fire protection collar FPC

Note: The fire protection collar FPC consists of a material that will produce foam in case of a fire and will tightly seal the joint.

- An additional joint width Δt of 10 mm can be closed by FPC Fire protection collar.

CRET serie 100 / CRET serie 100V	Annex A6 of European Technical Assessment ETA-23/0065
Product description Dimensions, materials of fire protective collar	

Table A6: Dowels materials

CRET Serie 100	Material ¹⁾	Corrosion Resistance Class	f _{y,k}
Dowel	1,4462	IV	≥ 780 Mpa
Sleeve	1,4301, 1.4307	II	-
Anchor box (plates)	1.4404, 1.4362, 1.4062, 1.4162	III	-
Anchor box (threaded rod / bolts)	Stainless steel A4	III	-

For the in-situ steel reinforcement approved B500 reinforcing steel shall be used.

CRET serie 100 / CRET serie 100V

Product description
Materials

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Specification of intended use

Dowel subjected to:

- Concrete elements that are subject to static and quasi-static actions.
- Structural concrete elements made of reinforced normal weight concrete of strength classes C25/30 to C50/60 according to EN 206.
- Nominal joint width from 10mm to 60mm according to Tables C1 to C3 (Annex C1).
- Concrete elements with a minimum slab thickness and the upper and lower maximum concrete cover in dependence of the dowel diameter given in Table B1 (Annex B1).
- Concrete element that are subjected to fire exposure.

Use conditions (environmental conditions) :

- Dowels with bars made of stainless steel and sleeves made of stainless that are subjected to environmental conditions according to EN 1993-1-4:2006+A1:2015, Annex A dependent on the corrosion resistant class (CRC) - depending on the material number, see EN 1993-1-4:2006 +A1:2015, table A.3).
- Dowels are intended to be used in concrete elements subjected to fire exposure when installed with Halfen fire protection collars according to Annex A4 to A5 and Annex D1.

Design

- Concrete elements that are designed according to EN 1992-1-1 or EN 1992-1-2.
- The design of the dowels and on-site reinforcement according to EOTA Technical report TR 065 and Table A5.

Table B1: Minimum slab thickness and maximum concrete cover for each dowel diameter

Dowel system	Dowel diameter [mm]	Minimum slab thickness [mm]	Maximum concrete cover for the minimum slab thickness ¹⁾ [mm]
CRET 122	22	180	30
CRET 124	24	200	30
CRET 128	28	240	30
CRET 134	34	300	30
CRET 140	40	350	30
CRET 122V	22	180	30
CRET 124V	24	200	30
CRET 128V	28	240	30

¹⁾ For higher concrete covers, the minimum slab thickness must be increased accordingly.

CRET serie 100 / CRET serie 100V

Intended use
Specifications

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Table C1: Resistance to steel failure at SLS, CRET serie 100V

CRET Serie 100V		
X ₃	0,44	[-]

Table C2: Resistance to steel failure at ULS, CRET serie 100V

Resistance to steel failure V _{Rd,s,ULS} ¹⁾ [kN]	Joint width [mm]					
	10	20	30	40	50	60
CRET 122V	107,7	79,4	59,8	47,2	38,7	32,8
CRET 124V	133,9	101,8	78,0	62,1	51,2	43,4
CRET 128V	183,7	146,4	115,5	93,4	77,7	66,3

Table C3: Resistance to steel failure at ULS, CRET serie 100

Resistance to steel failure V _{Rd,s,ULS} ¹⁾ [kN]	Joint width [mm]					
	10	20	30	40	50	60
CRET 122	119,7	88,2	66,5	52,5	43,1	36,4
CRET 124	148,7	113,1	86,7	69,0	56,9	48,2
CRET 128	204,1	162,7	128,4	103,8	86,4	73,6
CRET 134	310,6	261,2	214,1	177,3	149,6	128,6
CRET 140	438,4	382,8	324,1	274,2	234,7	203,8

1) with e [mm] = 0

Table C4: CRET serie 100, product performance

CRET Serie 100		
$X_{1,1}$	0,506	[-]
$B_{spec,1}$	CRET 122 = 70	[mm]
	CRET 124 = 76	[mm]
	CRET 128 = 88	[mm]
	CRET 134 = 106	[mm]
	CRET 140 = 124	[mm]
$H_{spec,1}$	CRET 122 = $0,5 \cdot h_{slab} + 40$	[mm]
	CRET 124 = $0,5 \cdot h_{slab} + 45$	[mm]
	CRET 128 = $0,5 \cdot h_{slab} + 55$	[mm]
	CRET 134 = $0,5 \cdot h_{slab} + 80$	[mm]
	CRET 140 = $0,5 \cdot h_{slab} + 100$	[mm]
$k_{1,1}$	0,0	[-]
$X_{2,1}$	0,472	[mm]

Table C5: CRET serie 100V, product performance

CRET Serie 100V		
$X_{1,2}$	0,516	[-]
$B_{spec,2}$	CRET 122 = 95	[mm]
	CRET 124 = 103	[mm]
	CRET 128 = 116	[mm]
$H_{spec,2}$	CRET 122 = $0,5 \cdot h_{slab} + 40$	[mm]
	CRET 124 = $0,5 \cdot h_{slab} + 45$	[mm]
	CRET 128 = $0,5 \cdot h_{slab} + 55$	[mm]
$k_{1,2}$	0,0	[-]
$X_{2,2}$	0,392	[mm]

CRET serie 100 / CRET serie 100V

Mechanical resistance and stability

Resistance to concrete edge failure at SLS

Resistance to concrete edge failure at ULS

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Resistance to fire

Performance characteristics with regard to load-bearing performance in case of fire in accordance with EN 13501-2

If the performance characteristics specified in section 3, annex C1 and C2 are complied with, the load-bearing capacity of the connection of reinforced concrete members with the shear force dowel in accordance with the intended use is also given under fire exposure according to the standard temperature time curve for a duration of 120 minutes if the following boundary conditions are met:

- The minimum slab thickness and corresponding maximum concrete cover according to Annex B1 shall be observed.
- The fire protection collars shall be installed between the concrete components according to Annex A5.
- The shear force dowels were designed for normal temperatures according to EOTA TR 065.
- The concrete components were designed for normal temperatures according to EN 1992-1-1.

For structural fire design (accidental design situation), the action shall be determined on the base of normal temperature using a maximum reduction factor of $\eta_{fi} = 0,7$ according to EN 1992-1-2, clause 2.4.2.

- The load-bearing capacity of the reinforced concrete components under fire exposure shall be verified for the intended use.

CRET serie 100 / CRET serie 100V	Annex D2 of European Technical Assessment ETA-23/0065
Resistance to fire	