ETA-Danmark A/S
Göteborg Plads 1
DK-2150 Nordhavn
Tel. +45 72 24 59 00
Internet www.etadanmark.dk

Authorised and notified according to Article 29 of the Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011

MEMBER OF EOTA

European Technical Assessment ETA-24/0276 of 2024/07/31

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:	fischer FCA 41/2,5 Cantilevers
Product family to which the above construction product belongs:	Installation systems for supporting technical building equipment
Manufacturer:	fischerwerke GmbH & Co. KG Klaus-Fischer-Strasse 1 72178 Waldachtal Germany
Manufacturing plant:	fischerwerke
This European Technical Assessment contains:	20 pages including 14 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 280016-00-0602, “Products for installation systems for supporting technical building equipment”
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.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full (except the confidential Annexes referred to above). 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.

II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of product

Objects of this European Technical Assessment are the following products:
Cantilever FCA 41/2,5 in various lengths between 300mm and 750mm.
The suspension of the cantilever consists of 2 drilled plates HK 41, a threaded rod and hexagon nuts.
Cantilevers and drilled plates can be electrogalvanised or hot-dip galvanised.
Annex A describes the dimensions and materials of the products.

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

The FCA 41/2,5 suspended with drilled plates HK 41 and threaded rod is used in installation systems of technical building equipment at ambient temperature and under fire exposure. The FCA 41/2,5 suspended with drilled plates HK 41and threaded rod is used to transfer loads from components of technical building equipment such as pipes and equipment for sprinkler, water, heating, cooling, ventilation, electrical and other installations.
The threaded rod for suspended support is fixed on a ceiling element with suitable fischer-anchors. The connection to the FCA 41/2,5 is made by using two drilled plates HK 41, one on the bottom side and one on the top side of the FCA 41/2,5. The drilled plates HK 41 are always used in pairs combined with threaded rod and hexagonal nuts. The threaded rod is guided through both drilled plates HK 41. Both drilled plates are tightened with a hexagonal nut to the recommended torque. After the assembly of the drilled plates and hexagon nut, the threaded rod should overlap at least 10 mm from the lower hexagon nut.

The following fixing options are provided for fixing fischer pipe clamps or other fischer assembly parts to the FCA 41/2,5 suspended with drilled plates HK 41 and threaded rod:

- Connection of the pipe clamps or other fischer assembly parts by using sliding nuts FCN Clix M or FCN Clix P combined with drilled plate HK 41 and suitable threaded rod as well as hexagon nuts.

- Connection of the pipe clamps or other fischer assembly parts by using two drilled plates HK 41, one on the bottom side and one on the top side of the FCA 41/2,5 combined with threaded rod and hexagonal nuts.

The FCA 41/2,5 and the threaded rod must be anchored to the building structure with suitable fischer-anchors. Before installation, it must be ensured that the component, they must be assembled to the FCA41/2,5 as well as the anchoring elements to the building structure and the building structure itself are suitable for absorbing the specified resistance values of the cantilever and that they have a fire protection certificate.
Characteristics of the product and methods and criteria for the assessing the performance of the
FCA 41/2,5:
BWR 2 – Safety in case of fire: assessing according to EAD 280016-00-0602.
BWR 4 – Safety and accessibility in use: assessing according to EAD 280016-00-0602.
The service life of the fischer FCA 41/2,5 is assumed to be at least 50 years under standard conditions of use and normal temperatures.

3 Performance of the product and references to the methods used for its assessment

Characteristic	Assessment of characteristic
3.1 Safety in case of fire (BWR2)	
Reaction to fire	Class A1
Resistance and deformation under fire exposure	See Annex C
3.3 Safety and accessibility in use (BWR4)	
Shape	See Annex A
Dimension	See Annex A
Material	See Annex A

See additional information in section 3.9.

3.9 General aspects related to the performance of the product.

The European Technical Assessment is issued for the product on the basis of agreed data/information, deposited with ETA-Danmark, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to ETA-Danmark before the changes are introduced. ETA-Danmark will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alterations to the ETA, shall be necessary.

The assessment of fitness of the channel for the intended use in relation to the requirements for safety in case of fire and safety and accessibility in use in the sense of the Basic Works Requirements 2 and 4 has been made in accordance with EAD 280016-00-0602, “Products for installation systems for supporting technical building equipment”.

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

4.1 AVCP system

In accordance with the European Assessment Document EAD 280016-00-0602 the applicable European legal act is:

For products for installation systems intended to be used for supporting pipes for the transport of water not intended for human consumption the applicable European legal act is Commission Decision 1999/472/EC, as amended by Commission Decision 2001/596/EC.

The system to be applied is 4. This includes uses that are subject to regulations on reaction to fire performance because the performance of the product is class A1 without the need to be tested for reaction to fire.

For products for installation systems intended to be used for supporting pipes for the transport of gas/fuel intended for the supply of building heating/cooling systems the applicable European legal act is Commission Decision 1999/472/EC, as amended by Commission Decision 2001/596/EC.

The system to be applied is 3.

For products for installation systems intended to be used for supporting technical building equipment in general the applicable European legal act is Commission Decision 97/161/EC. The system to be applied is 2+.

For products for installation systems intended to be used for supporting components of fixed fire-fighting systems the applicable European legal act is Commission Decision 96/577/EC, as amended by Commission Decision 2002/592/EC.

The system to be applied is 1.

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 2024-07-31 by

Thomas Bruun
Managing Director, ETA-Danmark

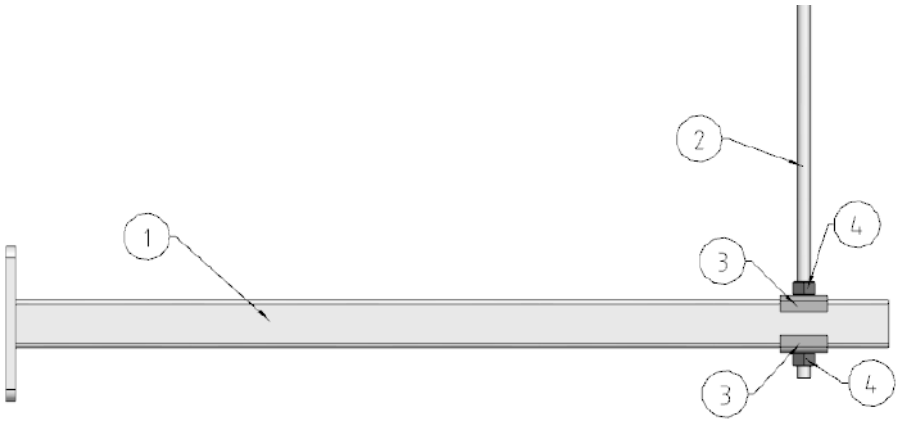
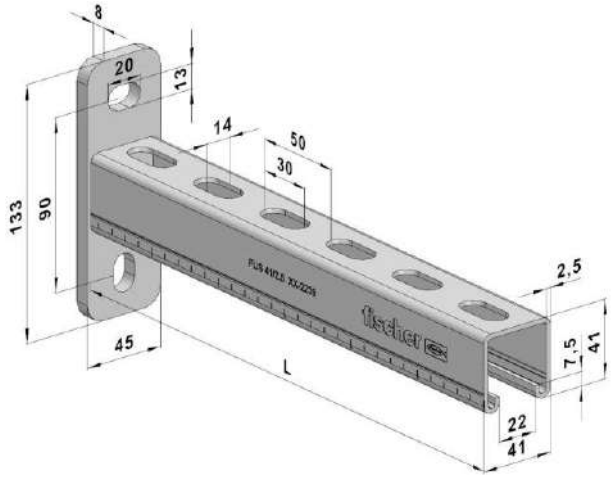


Figure A1.1: FCA 41/2,5 with suspension Figure not to scale

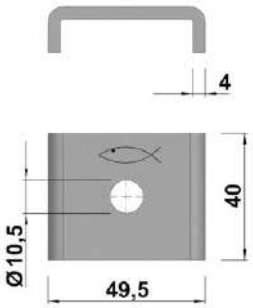
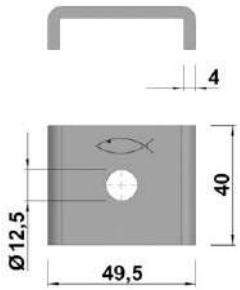
	Legend	Annex	ETA- Assessment
1	FCA 41/2,5	A2	
2	Threaded rod	A3	ETA 22/0095
3	Drilled plate HK 41	A2	ETA 21/0155
4	Hexagonal nut	A3	

Table A2.1: Dimensions and materials of the FCA 41/2,5

Figure	Designation	L [mm]	Material
	FCA 41/2,5-300	300	steel, S235JR acc. to EN 10025-2:2019 electrogalvanised acc. to EN 4042:2022 or alternative: hot-dip galvanised acc. to EN ISO 1461:2022
	FCA 41/2,5-450	450	
	FCA 41/2,5-600	600	
	FCA 41/2,5-750	750	

Dimensions in mm / Figure not to scale

Table A2.2: Dimensions and materials of the drilled plate HK 41

Figure	Designation	Material
	HK 41 10,5	steel, S235JR acc. to EN 10025-2:2019 electrogalvanised acc. to EN 4042:2022 or alternative: hot-dip galvanised acc. to EN ISO 1461:2022
	HK 41 12,5	steel, S235JR acc. to EN 10025-2:2019 electrogalvanised acc. to EN 4042:2022 or alternative: hot-dip galvanised acc. to EN ISO 1461:2022

Dimensions in mm / Figures not to scale

fischer FCA 41/2,5 with suspension	**Annex A2**
Product description (kit) Dimensions and materials of the components of the kit	

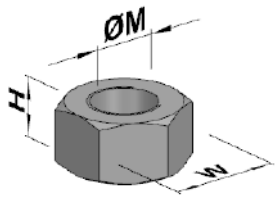
Table A3.1: Dimensions and materials of threaded rods

Figure	Designation	M	L[1)] [mm]	Material
	G 10	M10	1000	Steel, grade 4.8 - 8.8 acc. to DIN 976:2016 electrogalvanised acc. to EN 4042:2022
	G 10/2	M10	2000	
	G 10/3	M10	3000	
	G 12	M12	1000	
	G 12/2	M12	2000	
	G12/3	M12	3000	

[1)] The lengths of the threaded rods shown in Table A2.3 serve as an example.

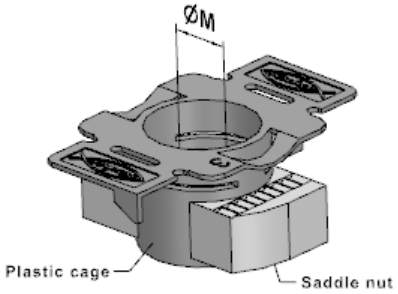
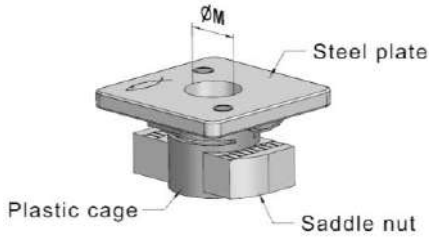
Dimensions in mm / Figure not to scale

Table A3.2: Dimensions and materials of hexagonal nuts

Figure	Designation	M	W	H	Material
	MU M10 Hexagonal nut	M10	17	8	Steel strength class 8 electrogalvanised acc. to EN 4042:2022
	MU M12 Hexagonal nut	M12	19	10	

Dimensions in mm / Figure not to scale

Table A2.5: Optional available connection elements

Figure	Designation	M	Material
 ETA-21/0330	FCN Clix P10	M10	<u>Saddle nut:</u> steel, S235JR acc. to EN 10025-2:2019 electrogalvanised acc. to EN 4042:2022 or alternative: hot-dip galvanised acc. to EN ISO 1461:2022 <u>Plastic cage:</u> Polyamide, Nylon 1013B <u>Steel plate:</u> steel, S235JR acc. to EN 10025-2:2019 electrogalvanised acc. to EN 4042:2022 or alternative: hot-dip galvanised acc. to EN ISO 1461:2022
	FCN Clix P12	M12	
 ETA-21/0330	FCN Clix M10	M10	
	FCN Clix M12	M12	

Dimensions in mm / Figure not to scale

Specification of intended use

The FCA 41/2,5 with suspension is used for load transfer of components of technical building equipment such as pipes and equipment for sprinkler, water, heating, cooling, ventilation, electrical and other installations at ambient temperatures and under fire exposure.
The performance specified for the FCA 41/2,5 with suspension, for load-bearing function in case of fire, applies to the boundary conditions of the standard temperature / time curve (STTC) in accordance with EN 1363-1:2020.

- The resistance of the FCA 41/2,5 with suspension in case of fire applies for static actions acting centrically on the threaded rod in accordance with Annex C1.
- The FCA 41/2,5 consist of a base plate with a welded-on channel section. The resistance of the welded connection in case of fire is characterised in Annex C3.
- The resistance of the FCA 41/2,5 at ambient temperatures applies for static actions in the direction of the main axes X-Y-Z of the section.
- Before installation, it must be ensured that the component to be supported by the FCA 41/2,5 the anchoring element to the building structure and the building structure itself were suitable to withstand the resistance values of the cantilever at ambient temperatures and under fire exposure.
- The FCA 41/2,5 must be installed by appropriately qualified personnel and under the supervision of the site manager. The general installation instructions of the manufacturer must be observed.

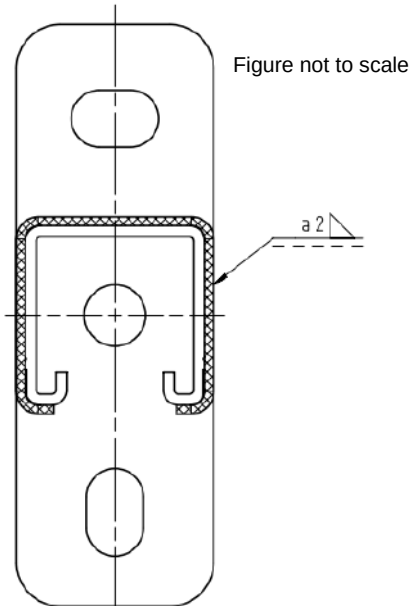


Figure B1.1: Welded connection of FCA 41/2,5

Table B 2.1: Technical specification of the FCA 41/2,5 channel profile

Designation	Symbol		Unit	
Weight	m	2,45	kg/m	
Cross-sectional area	A	311,3	mm^2	
Moments of inertia	I_y	64416	mm^4	
	I_z	89531	mm^4	
Polar moments of inertia	I_p	153947	mm^4	
	$I_{p,M}$	639597	mm^4	
Radii of inertia	i_y	14,4	mm	
	i_z	17,0	mm	
Polar radii of inertia	i_p	22,2	mm	
	$i_{p,M}$	45,3	mm	
Torsional moment of inertia	I_T	620	mm^4	
Moments of resistance	$W_{y,max}$	3426	mm^3	
	$W_{y,min}$	-2901	mm^3	
	$W_{z,max}$	4367	mm^3	
	$W_{z,min}$	-4367	mm^3	
Max. plastic moments of resistance	$W_{pl,y}$	4038	mm^3	
	$W_{pl,z}$	5091	mm^3	

All geometric values apply in the direction of the main axes X-Y-Z of the channel profile.

Resistance of FCA 41/2,5 without suspension at ambient temperatures

Table C1.1: Characteristic resistance of the FCA41/2,5 at ambient temperatures - according to the spatial coordinate system defined in Figure C1.1

$+F_{X,Rk}$ [kN]	$-F_{X,Rk}$ [kN]	$+F_{Y,Rk}$ [kN]	$-F_{Y,Rk}$ [kN]	$+F_{Z,Rk}$ [kN]	$-F_{Z,Rk}$ [kN]
n.a	**n.a**	**n.a**	**n.a**	**25,6**	**25,6**
$+M_{X,Rk}$ [Nm]	$-M_{X,Rk}$ [Nm]	$+M_{Y,Rk}$ [Nm]	$-M_{Y,Rk}$ [Nm]	$+M_{Z,Rk}$ [Nm]	$-M_{Z,Rk}$ [Nm]
n.a	**n.a**	**n.a**	**n.a**	**n.a**	**n.a**

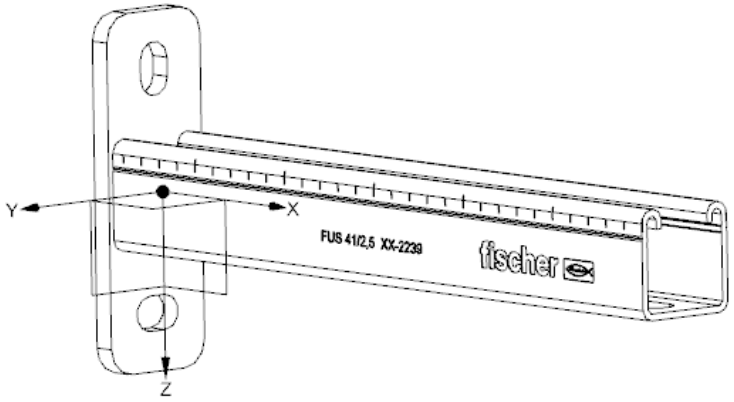


Figure not to scale

Figure C1.1: FCA 41/2,5: Definition of the coordinate system

Characteristic resistances for ambient temperatures do not take deflections into account.
The partial safety factor for design resistance is $\gamma_M = F_{Rk} / F_{Rd}$ or $\gamma_M = M_{Rk} / M_{Rd}$.
Design resistances should be specified in accordance with EN 1993-1-1:2010, and national regulations must be observed.

If multiple forces act simultaneously on the FCA 41/2,5, the additive superposition of the individual stress ratios in accordance with EN 1993-1-1:2010 can be used for the design of the FCA 41/2,5.

The verification may be performed with internal forces according to second-order theory, taking into account equivalent imperfections. In addition, the reduction of the moment load-bearing capacity as a function of the shear force in accordance with EN 1993-1-3:2010 must be taken into account for the channel section, if necessary.

Resistance of FCA 41/2,5 without suspension at ambient temperatures
Verification of the individual components based on the internal forces from static calculations.

Table C2.1: Characteristic resistance of the base plate at ambient temperatures – according to the spatial coordinate system defined in Figure C1.1

$+F_{X,Rk}$ [kN]	$-F_{X,Rk}$ [kN]	$+F_{Y,Rk}$ [kN]	$-F_{Y,Rk}$ [kN]	$+F_{Z,Rk}$ [kN]	$-F_{Z,Rk}$ [kN]
13,8	**35,5**	**13,0**	**13,0**	**47,0**	**47,0**
$+M_{X,Rk}$ [Nm]	$-M_{X,Rk}$ [Nm]	$+M_{Y,Rk}$ [Nm]	$-M_{Y,Rk}$ [Nm]	$+M_{Z,Rk}$ [Nm]	$-M_{Z,Rk}$ [Nm]
293	**293**	**549**	**549**	**201**	**201**

Table C2.2: Characteristic resistance of the channel section at ambient temperatures – according to the spatial coordinate system defined in Figure C1.1

$+F_{X,Rk}$ [kN]	$-F_{X,Rk}$ [kN]	$+F_{Y,Rk}$ [kN]	$-F_{Y,Rk}$ [kN]	$+F_{Z,Rk}$ [kN]	$-F_{Z,Rk}$ [kN]
69,6	**69,1**	**8,2**	**8,2**	**25,6**	**25,6**
$+M_{X,Rk}$ [Nm]	$-M_{X,Rk}$ [Nm]	$+M_{Y,Rk}$ [Nm]	$-M_{Y,Rk}$ [Nm]	$+M_{Z,Rk}$ [Nm]	$-M_{Z,Rk}$ [Nm]
33	**33**	**681**	**681**	**1026**	**1026**

Table C2.3: Characteristic resistance of the welded joint at ambient temperatures – according to the spatial coordinate system defined in Figure C1.1

$+F_{X,Rk}$ [kN]	$-F_{X,Rk}$ [kN]	$+F_{Y,Rk}$ [kN]	$-F_{Y,Rk}$ [kN]	$+F_{Z,Rk}$ [kN]	$-F_{Z,Rk}$ [kN]
n.a	**n.a**	**n.a**	**n.a**	**47,2**	**47,2**
$+M_{X,Rk}$ [Nm]	$-M_{X,Rk}$ [Nm]	$+M_{Y,Rk}$ [Nm]	$-M_{Y,Rk}$ [Nm]	$+M_{Z,Rk}$ [Nm]	$-M_{Z,Rk}$ [Nm]
n.a	**n.a**	**n.a**	**n.a**	**n.a**	**n.a**

Characteristic resistances for ambient temperatures do not take deflections into account.
The partial safety factor for design resistance is $\gamma_M = F_{Rk} / F_{Rd}$ or $\gamma_M = M_{Rk} / M_{Rd}$.
Design resistances should be specified in accordance with EN 1993-1-1:2010 and national regulations must be observed.

If multiple forces act simultaneously on the FCA 41/2,5, the additive superposition of the individual stress ratios in accordance with EN 1993-1-1:2010 can be used for the design of the FCA 41/2,5.

The verification may be performed with internal forces according to second-order theory, taking into account equivalent imperfections. In addition, the reduction of the moment load-bearing capacity as a function of the shear force in accordance with EN 1993-1-3:2010 must be taken into account for the channel section, if necessary.

Stress at 2% strain of FCA 41/2,5 channel profile under fire exposure.

Table C3.1: Stress at 2% strain in N/mm² for 800°C ≤ T ≤ 1050°C

	Temperature in °C									
	800	**842**	**850**	**900**	**945**	**950**	**1000**	**1006**	**1049**	**1050**
FCA 41/2,5	24,15	17,63	16,39	13,42	12,40	12,29	10,82	10,58	8,87	8,83

Table C3.2: Stress at 2% strain for fire protection-relevant times t = [30, 60, 90, 120] minutes

	t = 30min [N/mm²]	**t = 60min** [N/mm²]	**t = 90min** [N/mm²]	**t = 120min** [N/mm²]
FCA 41/2,5	17,63	12,40	10,58	8,87

Resistance of FCA 41/2,5 weld seam under fire exposure.

Table C3.3: Resistance of FCA 41/2,5 weld seam in case of fire: Parameter of the regressions curve

	Parameter of regression curve			Time interval	
	c_1 [N/mm²]	**c_2** [N/mm²·min]	**c_3** [-]	**t_{min}** [min]	**t_{max}** [min]
FCA 41/2,5	14,2516	1574,9234	0,911064	21	144

Based on the coefficients given in Table C3.3, the characteristic load-bearing capacities in case of fire $\sigma_{Rk(30)}$, $\sigma_{Rk(60)}$, $\sigma_{Rk(90)}$, $\sigma_{Rk(120)}$ are calculated in Table C3.4 for the discrete times t = [30, 60, 90, 120]min.

The equation for determining the load-bearing capacities at each specific time point within the defined time interval is as follows: $\sigma_{Rk(t)} = c_3(c_1 + c_2/t)$

Table C3.4: Load-bearing capacities $\sigma_{Rk(t)}$ of FCA 41/2,5 weld seam in case of fire t = [30, 60, 90, 120] minutes

	$\sigma_{Rk(30)}$ [N/mm²]	**$\sigma_{Rk(60)}$** [N/mm²]	**$\sigma_{Rk(90)}$** [N/mm²]	**$\sigma_{Rk(120)}$** [N/mm²]
FCA 41/2,5	60,8	36,9	28,9	24,9

The assessment of the time depending resistance $F_{Rk,t}$ shall follow the procedures described in EAD 280016-00-0602 - Annex K.7

Legend of the coefficients of Tables C5.1 to C8.1

The stress-strain dependencies can be interpolated for a given static system.
The interpolation procedure is described in EAD 280016-00-0602 for temperatures from 800°C to 1050°C.
The stress-strain dependencies required for the interpolation can be derived from the test results in Annex C5 to Annex C8.

Table C4.1 describes the evaluation coefficients.
Tables C5.1 to C8.1 list the resulting deformations of FCA 41/2,5 under the thermal load of the standard temperature/time curve and the mechanical bending stress of 5 to 30 N/mm².

Table C4.1: Symbols and designation of Tables C5.1 to C8.1

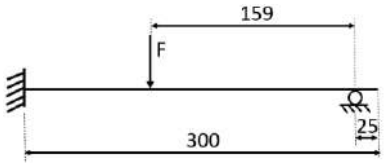
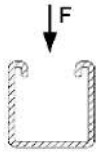
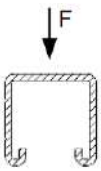
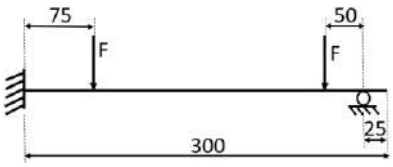
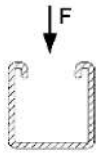
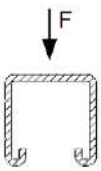
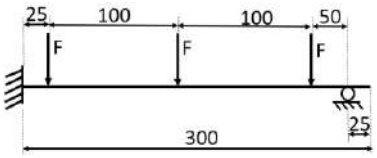
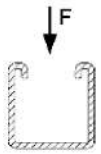
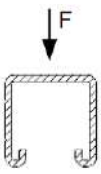
Coefficient	Unit	Designation
σ_B	[N/mm²]	Bending Stress of the channel
V	[-]	Momentum degree of fullness
F	[N]	Load
$\delta_{tmax;B}$	[mm]	Deformation of the channel at the time of stability failure or plastic hinge formation
$t_{tmax;B}$	[min]	Time of the stability failure or plastic hinge formation of the channel
δ_{30}	[mm]	Deformation at R30 according to EN 1363-1:2012-10
δ_{60}	[mm]	Deformation at R60 according to EN 1363-1:2012-10
δ_{90}	[mm]	Deformation at R90 according to EN 1363-1:2012-10
δ_{120}	[mm]	Deformation at R120 according to EN 1363-1:2012-10

The deformation prognosis may be determined for all spans and stress situations through interpolation regarding

- span
- load type, defined by the momentum degree of fullness
- stress level

The assessment of the time-depending deformations δ_t shall follow the procedures described in EAD 280016-00-0602 - Annex K.4

Table C5.1: Calculation-based deformation of FCA 41/2,5 -300 cantilever with suspension in case of fire

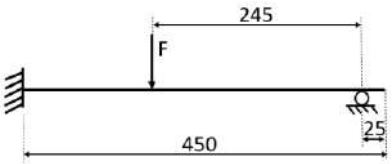
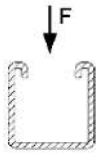
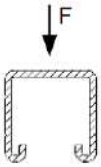
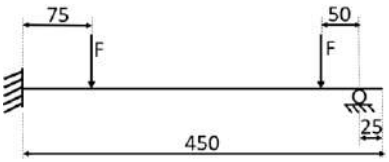
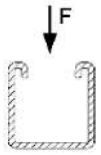
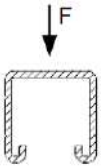
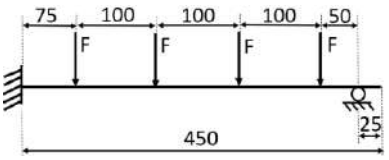
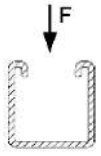
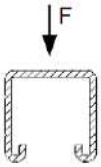
System	Load direction	σ_B	F	V*	$\delta_{tmax,B}$	$t_{max,B}$	δ_{30}	δ_{60}	δ_{90}	δ_{120}
		[N/mm²]	[N]	---	[mm]	[min]	[mm]	[mm]	[mm]	[mm]
Single load in field (SF) 		5	269	0,50	4,18	120	0,31	2,44	3,90	4,18
		10	543	0,50	7,52	120	0,80	4,07	6,21	7,52
		15	818	0,50	12,29	120	1,59	6,16	9,37	12,29
		20	1092	0,50	20,68	120	2,77	9,02	13,97	20,68
		25	1366	0,50	20,88	86,67	4,45	12,69	-----	-----
		30	1640	0,50	6,96	26,67	-----	-----	-----	-----
		5	269	0,50	4,35	120	0,35	2,54	4,04	4,35
		10	543	0,50	8,07	120	0,92	4,34	6,58	8,07
		15	818	0,50	13,26	120	1,84	6,70	10,12	13,26
		20	1092	0,50	20,55	120	3,22	9,86	15,03	20,55
		25	1366	0,50	29,58	120	5,21	13,82	21,24	29,58
		30	1640	0,50	41,60	120	7,88	19,15	30,24	41,60
Two single loads close to the edges (SE) 		5	200	0,59	4,03	120	0,29	2,32	3,77	4,03
		10	403	0,59	7,13	120	0,75	3,93	5,98	7,13
		15	607	0,59	11,90	120	1,42	5,93	9,01	11,90
		20	810	0,59	17,88	120	2,46	8,40	13,00	17,88
		25	1014	0,59	28,14	120	3,85	11,85	18,79	28,14
		30	1217	0,59	61,5	120	5,89	16,27	27,19	61,50
		5	200	0,59	4,07	120	0,30	2,35	3,80	4,07
		10	403	0,59	7,21	120	0,78	4,00	6,05	7,21
		15	607	0,59	11,83	120	1,47	5,99	9,05	11,83
		20	810	0,59	17,00	120	2,52	8,37	12,72	17,00
		25	1014	0,59	24,60	120	3,90	11,66	17,85	24,60
		30	1217	0,59	33,71	120	5,82	15,60	24,00	33,71
Uniformly distributed load (DL) 		5	144	0,61	4,09	120	0,30	2,37	3,83	4,09
		10	292	0,61	7,31	120	0,78	4,01	6,10	7,31
		15	439	0,61	11,70	120	1,50	6,01	9,06	11,70
		20	586	0,61	16,89	120	2,60	8,57	12,89	16,89
		25	733	0,61	22,95	120	4,09	11,66	17,36	22,95
		30	880	0,61	29,71	120	6,13	15,09	22,15	29,71
		5	144	0,61	4,16	120	0,32	2,42	3,89	4,16
		10	292	0,61	7,53	120	0,84	4,15	6,28	7,53
		15	439	0,61	11,88	120	1,62	6,19	9,27	11,88
		20	586	0,61	16,83	120	2,77	8,78	13,03	16,83
		25	733	0,61	22,48	120	4,31	11,81	17,30	22,48
Figures not to scale		30	880	0,61	28,29	120	6,36	15,10	21,74	28,29

* Momentum degree of fullness applies to loading without considering the dead weight

The calculation of the cantilever deformation is without explicit consideration of a specific load-transmitting component. The deformations of the installed cantilever shall be additively superimposed with the time-depending elongation of the threaded rod used.

The assessment of the time-depending deformations δ_t shall follow the procedures described in EAD 280016-00-0602 - Annex K.4

Table C6.1: Calculation-based deformation of FCA 41/2,5 -450 cantilever with suspension in case of fire

System	Load direction	σ_B	F	V*	$\delta_{tmax,B}$	$t_{max,B}$	δ_{30}	δ_{60}	δ_{90}	δ_{120}
		[N/mm²]	[N]	---	[mm]	[min]	[mm]	[mm]	[mm]	[mm]
Single load in field (SF) 		5	170	0,50	4,80	120	0,53	2,87	4,42	4,80
		10	348	0,50	11,59	120	1,57	6,18	9,13	11,59
		15	525	0,50	23,37	120	3,19	10,31	15,50	23,37
		20	702	0,50	50,51	120	5,59	16,65	37,45	50,51
		25	880	0,50	70,26	113,33	9,08	37,72	53,95	-----
		30	1057	0,50	10,26	26,67	-----	-----	-----	-----
		5	170	0,50	4,91	120	0,55	2,94	4,51	4,91
		10	348	0,50	11,85	120	1,62	6,31	9,32	11,85
		15	525	0,50	20,78	120	3,32	10,48	15,51	20,78
		20	702	0,50	33,31	120	5,81	16,17	24,16	33,31
		25	880	0,50	48,29	120	9,29	23,02	34,48	48,29
		30	1057	0,50	64,56	120	13,83	31,77	47,67	64,56
Two single loads close to the edges (SE) 		5	172	0,52	4,29	120	0,42	2,46	3,97	4,29
		10	351	0,52	8,81	120	1,20	5,04	7,36	8,81
		15	530	0,52	17,10	120	2,35	8,59	12,72	17,10
		20	709	0,52	26,36	120	3,85	12,35	18,61	26,36
		25	889	0,52	45,13	120	6,02	17,49	27,49	45,13
		30	1068	0,52	83,35	120	8,74	24,52	43,74	83,35
		5	172	0,52	4,30	120	0,42	2,47	3,98	4,30
		10	351	0,52	8,58	120	1,21	4,99	7,25	8,58
		15	530	0,52	16,11	120	2,34	8,39	12,30	16,11
		20	709	0,52	23,88	120	3,77	11,90	17,52	23,88
		25	889	0,52	32,35	120	5,80	16,11	23,89	32,35
		30	1068	0,52	43,12	120	8,24	21,61	32,02	43,12
Uniformly distributed load (DL) 		5	61	0,61	4,57	120	0,50	2,71	4,23	4,57
		10	124	0,61	11,02	120	1,50	6,05	8,86	11,02
		15	188	0,61	18,89	120	2,97	9,88	14,37	18,89
		20	251	0,61	27,21	120	5,18	14,54	20,93	27,21
		25	315	0,61	36,68	120	7,98	19,97	28,27	36,68
		30	378	0,61	46,94	120	11,56	25,56	35,84	46,94
		5	61	0,61	4,59	120	0,50	2,72	4,25	4,59
		10	124	0,61	11,02	120	1,52	6,08	8,88	11,02
		15	188	0,61	18,73	120	2,99	9,89	14,31	18,73
		20	251	0,61	26,66	120	5,19	14,47	20,67	26,66
		25	315	0,61	35,62	120	7,96	19,78	27,77	35,62
		30	378	0,61	44,76	120	11,47	25,11	34,87	44,76

Figures not to scale

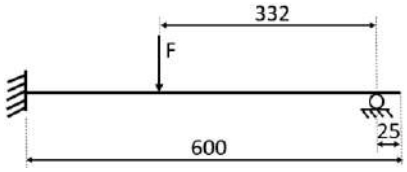
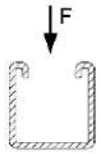
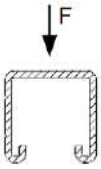
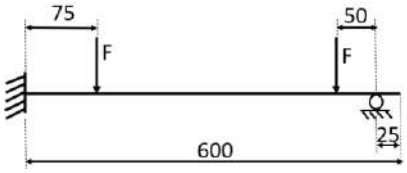
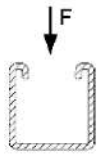
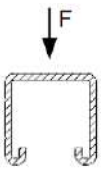
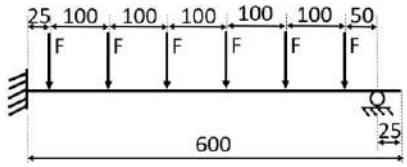
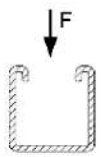
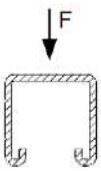
* Momentum degree of fullness applies to loading without considering the dead weight

The calculation of the cantilever deformation is without explicit consideration of a specific load-transmitting component. The deformations of the installed cantilever shall be additively superimposed with the time-depending elongation of the threaded rod used.

The assessment of the time-depending deformations δ_t shall follow the procedures described in EAD 280016-00-0602 - Annex K.4

fischer FCA 41/2,5 with suspension	**Annex C6**
Performance Deformation characteristics of the FCA 41/2,5 -450 cantilever with suspension under fire exposure	

Table C7.1: Calculation-based deformation of FCA 41/2,5 -600 cantilever with suspension in case of fire

System	Load direction	σ_B	F	V*	$\delta_{tmax,B}$	$t_{max,B}$	δ_{30}	δ_{60}	δ_{90}	δ_{120}
		[N/mm²]	[N]		[mm]	[min]	[mm]	[mm]	[mm]	[mm]
Single load in field (SF) 		5	122	0,50	5,59	120	0,83	3,41	5,08	5,59
		10	253	0,50	16,66	120	2,57	8,85	12,79	16,66
		15	384	0,50	52,96	120	5,24	16,00	28,06	52,96
		20	515	0,50	81,17	120	9,25	38,13	61,03	81,17
		25	646	0,50	116,43	120	18,55	60,88	86,39	116,43
		30	777	0,50	152,48	120	39,19	81,65	121,98	152,48
		5	122	0,50	5,66	120	0,84	3,46	5,14	5,66
		10	253	0,50	16,68	120	2,59	8,90	12,86	16,68
		15	384	0,50	30,88	120	5,29	15,52	22,64	30,88
		20	515	0,50	50,05	120	9,18	24,48	36,07	50,05
		25	646	0,50	73,42	120	14,52	35,36	52,33	73,42
		30	777	0,50	98,19	120	21,59	49,17	72,57	98,19
Two single loads close to the edges (SE) 		5	157	0,48	4,68	120	0,60	2,69	4,27	4,68
		10	326	0,48	10,66	120	1,76	6,27	8,88	10,66
		15	495	0,48	23,52	120	3,48	11,67	17,09	23,52
		20	664	0,48	40,18	120	5,62	17,47	26,40	40,18
		25	834	0,48	80,77	120	8,65	25,21	43,01	80,77
		30	1003	0,48	113,19	120	12,62	38,43	78,95	113,19
		5	157	0,48	4,68	120	0,60	2,68	4,27	4,68
		10	326	0,48	10,10	120	1,74	6,11	8,59	10,10
		15	495	0,48	21,08	120	3,41	11,18	16,04	21,08
		20	664	0,48	32,34	120	5,42	16,38	23,72	32,34
		25	834	0,48	43,41	120	8,12	21,98	31,93	43,41
		30	1003	0,48	55,58	120	11,47	29,08	42,01	55,58
Uniformly distributed load (DL) 		5	32	0,61	5,23	120	0,77	3,15	4,77	5,23
		10	67	0,61	15,38	120	2,45	8,57	12,20	15,38
		15	102	0,61	27,31	120	4,83	14,62	20,75	27,31
		20	136	0,61	38,84	120	8,28	21,38	29,93	38,84
		25	171	0,61	51,79	120	12,50	29,21	40,26	51,79
		30	206	0,61	66,76	120	17,63	37,33	51,20	66,76
		5	32	0,61	5,22	120	0,77	3,15	4,77	5,22
		10	67	0,61	15,32	120	2,45	8,58	12,18	15,32
		15	102	0,61	27,06	120	4,82	14,59	20,62	27,06
		20	136	0,61	38,31	120	8,26	21,23	29,59	38,31
		25	171	0,61	50,39	120	12,44	28,98	39,63	50,39
Figures not to scale		30	206	0,61	63,51	120	17,45	36,84	49,94	63,51

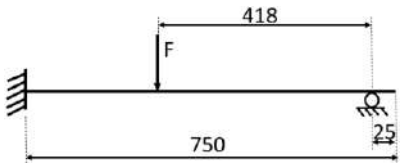
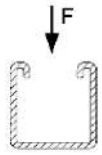
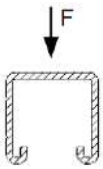
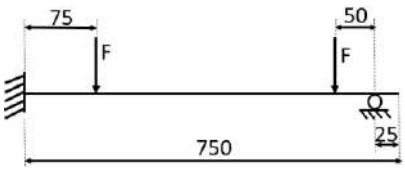
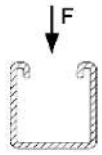
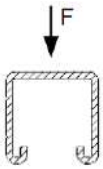
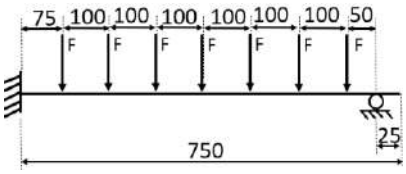
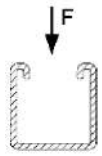
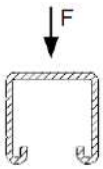
* Momentum degree of fullness applies to loading without considering the dead weight

The calculation of the cantilever deformation is without explicit consideration of a specific load-transmitting component. The deformations of the installed cantilever shall be additively superimposed with the time-depending elongation of the threaded rod used.

The assessment of the time-depending deformations δ_t shall follow the procedures described in EAD 280016-00-0602 - Annex K.4

fischer FCA 41/2,5 with suspension	**Annex C7**
Performance Deformation characteristics of the FCA 41/2,5 -600 cantilever with suspension under fire exposure	

Table C8.1: Calculation-based deformation of FCA 41/2,5 -750 cantilever with suspension in case of fire

System	Load direction	σ_B	F	V*	$\delta_{tmax,B}$	$t_{max,B}$	δ_{30}	δ_{60}	δ_{90}	δ_{120}
		[N/mm²]	[N]		[mm]	[min]	[mm]	[mm]	[mm]	[mm]
Single load in field (SF) 		5	92	0,50	6,52	120	1,19	4,03	5,85	6,52
		10	196	0,50	23,07	120	3,77	12,00	17,15	23,07
		15	300	0,50	67,70	120	7,73	25,69	44,36	67,70
		20	404	0,50	108,82	120	14,72	52,31	78,25	108,82
		25	508	0,50	157,67	120	30,12	79,07	115,70	157,67
		30	612	0,50	200,23	120	55,02	111,31	163,84	200,23
		5	92	0,50	6,54	120	1,19	4,06	5,87	6,54
		10	196	0,50	22,22	120	3,76	11,93	16,97	22,22
		15	300	0,50	43,01	120	7,63	21,63	31,16	43,01
		20	404	0,50	69,87	120	13,16	34,42	50,23	69,87
		25	508	0,50	102,86	120	20,63	50,18	73,54	102,86
		30	612	0,50	136,5	120	30,68	70,04	101,72	136,5
Two single loads close to the edges (SE) 		5	145	0,45	5,18	120	0,83	2,98	4,66	5,18
		10	309	0,45	12,82	120	2,43	7,69	10,65	12,82
		15	473	0,45	31,60	120	4,80	15,31	22,31	31,60
		20	636	0,45	61,26	120	7,74	23,62	36,41	61,26
		25	800	0,45	103,57	120	11,76	35,59	66,74	103,57
		30	964	0,45	133,18	120	17,38	61,24	101,41	133,18
		5	145	0,45	5,17	120	0,83	2,97	4,65	5,17
		10	309	0,45	11,93	120	2,38	7,42	10,16	11,93
		15	473	0,45	26,87	120	4,65	14,41	20,37	26,87
		20	636	0,45	42,12	120	7,41	21,60	30,91	42,12
		25	800	0,45	56,43	120	10,82	29,02	41,58	56,43
		30	964	0,45	70,42	120	15,24	37,85	53,66	70,42
Uniformly distributed load (DL) 		5	19	0,61	6,02	120	1,12	3,68	5,43	6,02
		10	41	0,61	20,24	120	3,60	11,50	16,02	20,24
		15	63	0,61	36,77	120	7,04	20,22	28,10	36,77
		20	85	0,61	52,13	120	11,89	29,25	40,07	52,13
		25	107	0,61	68,20	120	17,67	39,61	53,49	68,2
		30	129	0,61	86,85	120	24,35	50,49	67,82	86,85
		5	19	0,61	6,03	120	1,12	3,68	5,44	6,03
		10	41	0,61	20,26	120	3,61	11,54	16,05	20,26
		15	63	0,61	36,77	120	7,05	20,25	28,10	36,77
		20	85	0,61	52,13	120	11,91	29,29	40,10	52,13
		25	107	0,61	67,74	120	17,69	39,68	53,43	67,74
Figures not to scale		30	129	0,61	85,16	120	24,38	50,48	67,39	85,16

* Momentum degree of fullness applies to loading without considering the dead weight

The calculation of the cantilever deformation is without explicit consideration of a specific load-transmitting component. The deformations of the installed cantilever shall be additively superimposed with the time-depending elongation of the threaded rod used.

The assessment of the time-depending deformations δ_t shall follow the procedures described in EAD 280016-00-0602 - Annex K.4

fischer FCA 41/2,5 with suspension	**Annex C8**
Performance Deformation characteristics of the FCA 41/2,5 -750 cantilever with suspension under fire exposure	