fischer

Fireproof pipe installation.
Certified fire protection for safe fixings.

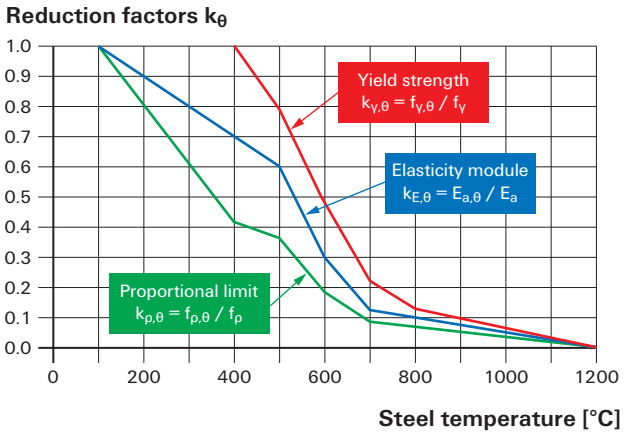
fischer Installation systems: Fire protection classification..

Verifications

- Fireproof installations for individual pipes and pipe routes of R30 – R120 and F30 – F120.
- Proof of compliance with the criteria according MLAR (German standard pipe system directive) for installation in escape and rescue routes.

Fire protection – protection goals:

Firstly, fire protection serves to protect people and is regulated by the building laws in the respective countries (or regional states). Secondly, fire protection serves to protect property. This is regulated by the insurance associations, such as VdS and FM. These requirements partially go beyond the building legislation. This is particularly evident in the installation of fire protection systems, such as sprinklers, etc.. In these cases approved or recognised components must be used (see the fischer catalogues for further details on this).



Dependency of the yield strength, proportional limit and elasticity module on the temperature (basis: EN1993-1-2:2012-12 Eurocode 3).

Test preparation

Fire inspection before.

Fire inspection after.

Fire inspection reports for the installation of pipe clamps and channels:

The fire safety inspection reports described in this brochure meet the requirements for fire protection according to the building regulations
of the countries and, especially for Germany, according to the nationwide homonymic German pipe systems directive (LAR), based on the standard pipe systems directive of 2005 (MLAR 2005). Personal protection is defined in the MLAR Directive through clear rules for escape routes, such as corridors, stairwells, hallways between stairwells and the exit. The key message is to ensure the safety of the escape route by ensuring the functioning of the fireproof sub-ceiling. Therefore a minimum distance of min a ≤ 50 mm according to MLAR is required between installations and underlying suspended fire-proof F30 sub-ceilings (fire resistance of 30 minutes). Based on the fire inspections, load information for a fire resistance of 30 minutes was determined in relation to the maximum permissible deformation of channels or pipe clamps. The necessity for these considerations arises from the properties of steel, which is subjected to a temperature of > 800 °C accor ding to the standard temperature curve (ISO curve).
Additionally, the same information is documented in inspection reports for a fire resistance rating of R30, R60, R90 and R120 according to EN1363-1 and DIN4102-2 (see load tables).

Fire inspection reports for installation systems - pipe clamps, sliding elements, channel and cantilever arm:

Following “supplementary sheets to inspection reports” from MFPA Leipzig are available:

- PUWF (Document no. GS 6.1/23-006-2)
- FRS (Document no. GS 3.2/14-175-2)
- FUS / FCA (Document no. GS3.2/14-175-4)
- FRS-L Universal (Document no. GS 3.2/15-141-3)
- FLS / ALK (Document no. GS 3.2/15-141-4)
- FASM2 / FASH2 (Document no. GS 6.1/22-066-2)

Additional available “fire inspection reports” from MPA NRW, similar to the above criteria are:

- SB sliding hanger (F120) inspection report no.
- PDH-K pendulum hanger (F120) inspection report no.

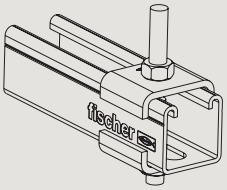
Certificates

F 30 MLAR F 120 R 30 MLAR R 120

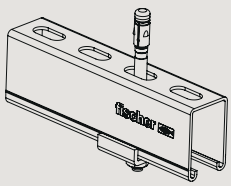
Product overview with proof in inspection reports and advisory opinions.

Product	Picture	Document no.	MLAR	R30 - R120	F30 - F120
FLS 37		MFPA Leipzig – GS 3.2/15-141-4	●	●	–
FUS 41		MFPA Leipzig – GS 3.2/14-175-4	●	●	–
FUS 62		MFPA Leipzig – GS 3.2/14-175-4	●	●	–
ALK 37		MFPA Leipzig – GS 3.2/15-141-4	●	●	–
FCA 41		MFPA Leipzig – GS 3.2/14-175-4	●	●	–
FCA 62		MFPA Leipzig – GS 3.2/14-175-4	●	●	–
PUWF		GS 6.1/23-006-2	●	●	–

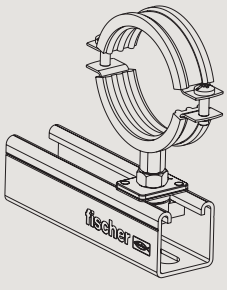
Product	Picture	Document no.	MLAR	R30 - R120	F30 - F120
FRS-L Universal		MFPA Leipzig – GS 3.2/15-141-3	●	●	–
FRS		MFPA Leipzig – GS 3.2/14-175-2	●	●	–
SB		MPA-NRW – 210005109-7			●
FASM 2 M10-12		MFPA Leipzig GS 6.1/22-066-2	●	●	–
FASH 2 M12-16		MFPA Leipzig GS 6.1/22-066-2	●	●	–
PDH-K		MPA-NRW – 210005109-6	●	–	●



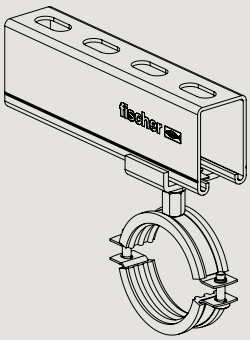
fischer channel washer HK 41 (≥ 10,5mm) or HK 31 (≥ 8,5mm)



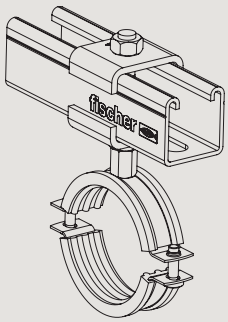
Connection ceiling fischer anchor and fischer channel washer HK 41 (≥ 10,5mm) orHK 31 (≥ 8,5mm)



fischer FCN Clix M or FSM Clix M (M8 und M10)

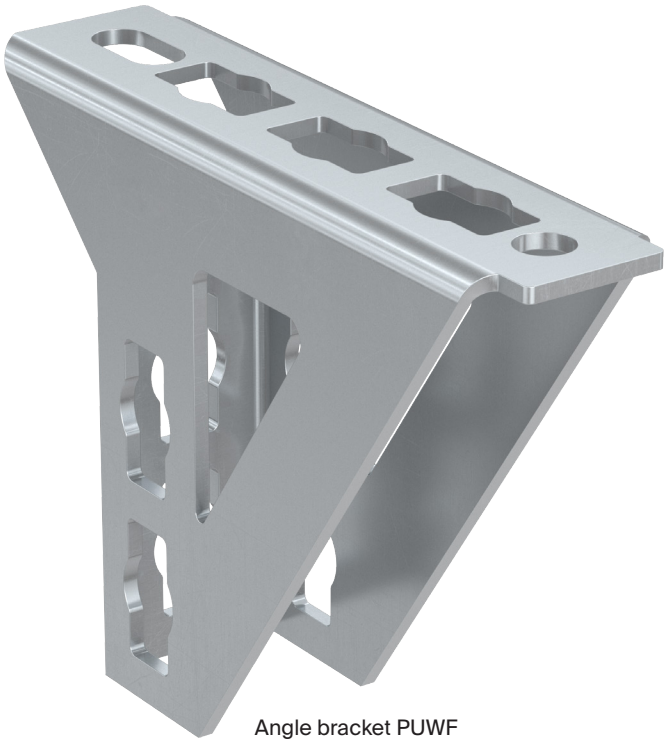


Combination with FCN Clix P or FSM Clix P (M8 oder M10) and HK



fischer channel washer HK 41 (≥ 10,5mm) or HK 31 (≥ 8,5mm)

Angle bracket fire-tested PUWF



Angle bracket PUWF

Your advantages at a glance

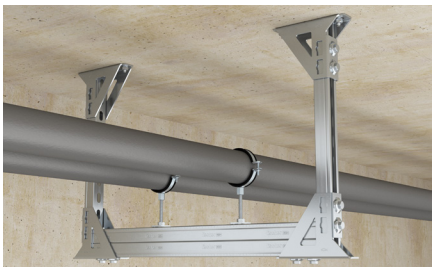
- The fire test report in accordance with MLAR/ EN1366 guarantees objectively tested functional safety.
- The stable design of the angle bracket allows high loads and ensures a secure hold. (use in pairs is recommended).
- Quick installation thanks to 90° rotation of the PFCN 41 push-through connector in the channel.
- The hole geometry allows the angle bracket to be attached to the FUS mounting channel in 3 positions with identical load-bearing capacity.

Applications

- Unique construction element for use as a connection to the substrate and for 90° angle connections.
- Allows the construction of applications with or without fire resistance requirements.
- For use in dry interior areas.

Applications

Ceiling frame construction



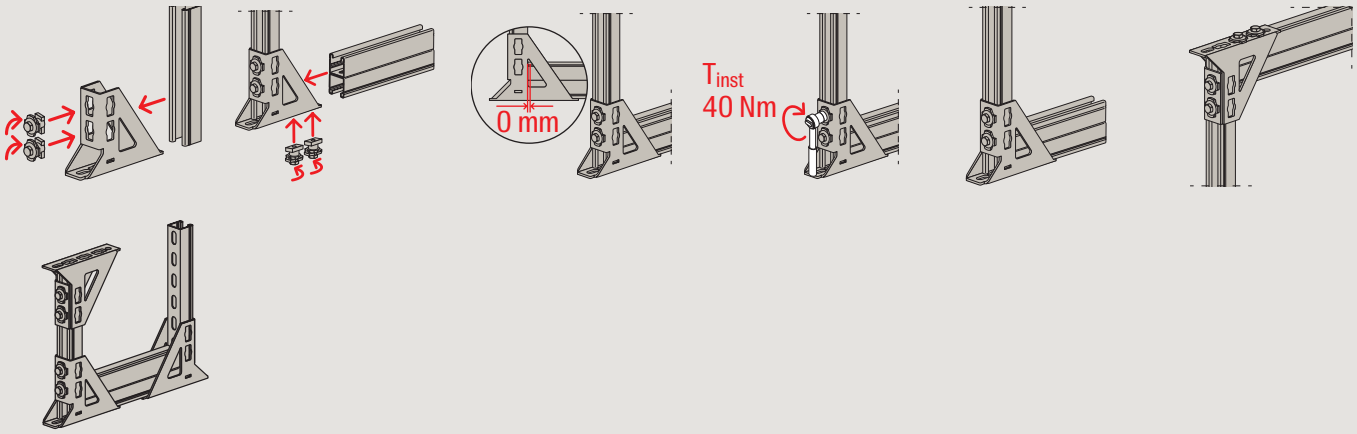
Ceiling frame construction tube mounting

Certificates

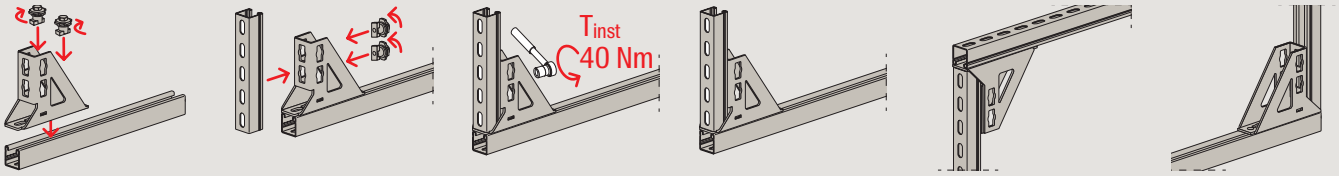
R 120

R 30 MLAR

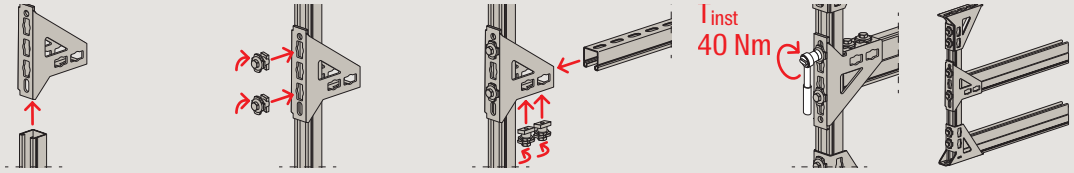
U-frame construction type 1 *



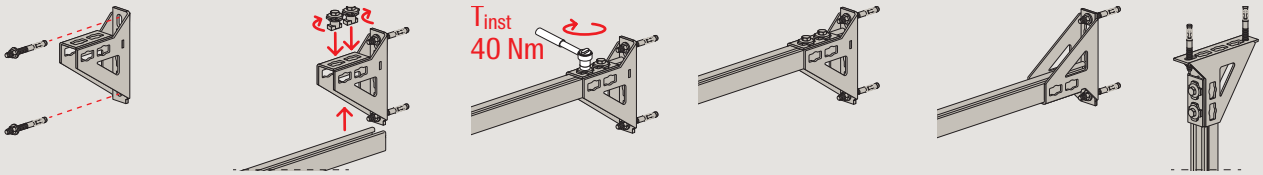
U-frame construction type 2



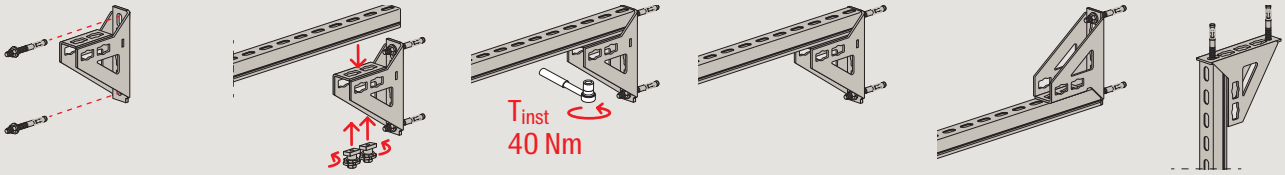
U-frame construction type 3 *



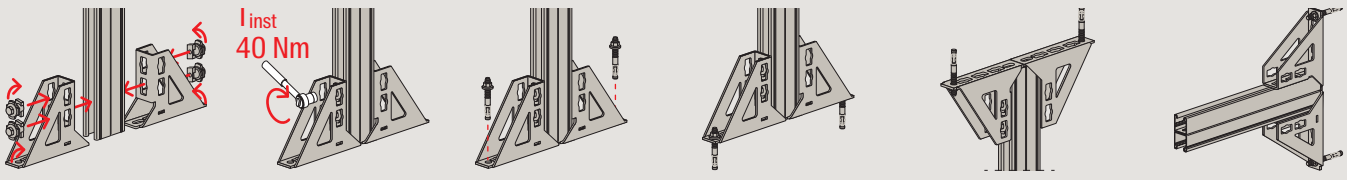
Substrate connection type 1 *



Substrate connection type 2

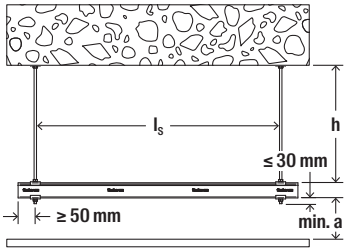


Substrate connection type 3

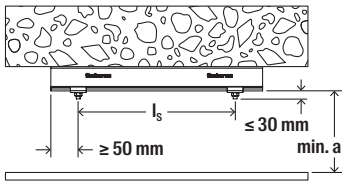


* Fire tested layout according to fire test report MLAR/EN1366

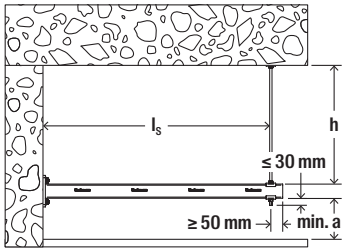
Load tables based on the advisory opinions.



Picture 1



Picture 2



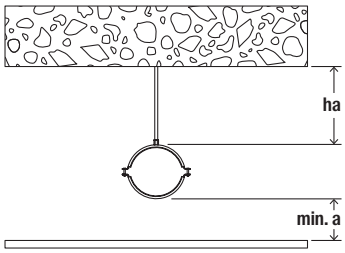
Picture 3

FLS-Channel / ALK-Cantilever arm

Load table based on the Adivisory Opinion No. GS 3.2/15-141-4
The following figures are valid for FLS channels and ALK cantilever arms, galvanized, hdg and stainless steel.

FLS/ALK 37/1,2 (Picture 1-3)		MLAR loads		Max. Loads				
Threaded rods ≥ 4.8		strain	F-resistance Min.	Max. strain	Fire resistance time [minute]			
Load case	ls [mm]	min a [mm]	30 [kN]	min a [mm]	30 [kN]	60 [kN]	90 [kN]	120 [kN]
Point load	≤ 400 [1]	≤ 50	0,24	93	0,24	0,13	0,10	0,09
	≤ 400 [2]	≤ 50	0,09	289	0,47	0,38	0,33	0,30
	≤ 400 [4]	≤ 50	0,32	226	1,33	0,78	0,53	0,40
Multiple load [3]	≤ 400 [1]	≤ 50	0,72	93	0,72	0,38	0,30	0,27
	≤ 400 [2]	≤ 50	0,26	289	1,42	1,13	0,99	0,90
	≤ 400 [4]	≤ 50	0,81	226	1,33	0,78	0,53	0,40
Uniformly distributed load	≤ 400 [1]	≤ 50	0,72	93	0,72	0,38	0,30	0,27
	≤ 400 [2]	≤ 50	0,35	308	1,37	1,19	1,06	0,95
	≤ 400 [4]	≤ 50	0,81	226	1,33	0,78	0,53	0,40

1) Valid for a suspension height ha = 0 mm, s. picture 2
2) Valid for a suspension height ha = 500 mm, s. picture 1 (Expansion length of threaded rods in case of fire ~ 10 mm/m)
3) Given load values apply for multiple loads as summated point loads symmetrical allocated
4) This values are valid for ALK 37–450 with additional support by threaded rod, s picture 3 (ha = 500 mm)



Pipe clamp FRS

Load table based on the Adivisory Opinion No. GS 3.2/14-175-2
The following figures are valid for all FRS pipe clamps, galvanized, hdg and stainless steel.

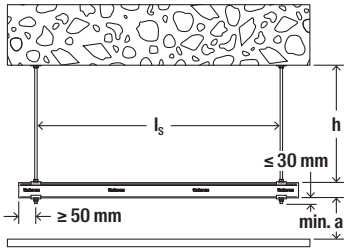
FRS M8/M10		MLAR		Maximale Lasten				
Threaded rods ≥ 4.8		strain	F-resist-ance	Max. strain	Fire resistance time [minute]			
Clamping range	ha	min a	30	min a	30	60	90	120
[mm]	[mm]	[mm]	[kN]	[mm]	[kN]	[kN]	[kN]	[kN]
12–67	≤ 250	≤ 50	0,56	51	0,56	0,29	0,20	0,15
	≤ 500	≤ 50	0,56	54	0,56	0,29	0,20	0,15
	≤ 750	≤ 50	0,56	57	0,56	0,29	0,20	0,15
	≤ 1000	≤ 50	0,55	60	0,56	0,29	0,20	0,15
72–92	≤ 250	≤ 50	0,65	50	0,79	0,49	0,36	0,29
	≤ 500	≤ 50	0,62	53	0,79	0,49	0,36	0,29
	≤ 750	≤ 50	0,59	56	0,79	0,49	0,36	0,29
	≤ 1000	≤ 50	0,57	59	0,79	0,49	0,36	0,29
108–116	≤ 250	≤ 50	0,48	61	0,63	0,39	0,29	0,23
	≤ 500	≤ 50	0,43	64	0,63	0,39	0,29	0,23
	≤ 750	≤ 50	0,39	66	0,63	0,39	0,29	0,23
	≤ 1000	≤ 50	0,35	69	0,63	0,39	0,29	0,23
121–168	≤ 250	≤ 50	0,96	61	1,00	0,51	0,34	0,25
	≤ 500	≤ 50	0,89	63	1,00	0,51	0,34	0,25
	≤ 750	≤ 50	0,82	66	1,00	0,51	0,34	0,25
	≤ 1000	≤ 50	0,85	69	1,00	0,51	0,34	0,25

Pipe clamp FRS-L Universal

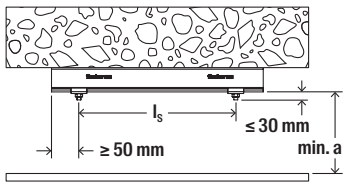
Load table based on the Adivisory Opinion No. GS 3.2/18-120-2
The following figures are valid for all FRS-L Universal pipe clamps, galvanized, hdg and stainless steel

FRS-L Universal M8/M10		MLAR -Loads		Max. Loads				
Threadeed rods ≥ 4.8		strain	F-resistance	Max. strain	Fire resistance time [minute]			
Clamping range	h_a	min a	30	min a	30	60	90	120
[mm]	[mm]	[mm]	[kN]	[mm]	[kN]	[kN]	[kN]	[kN]
8–37	≤ 250	≤ 50	0,27	54	0,27	0,14	0,09	0,07
	≤ 500	≤ 50	0,26	57	0,27	0,14	0,09	0,07
	≤ 750	≤ 50	0,24	60	0,27	0,14	0,09	0,07
	≤ 1000	≤ 50	0,22	62	0,27	0,14	0,09	0,07
38–66	≤ 250	≤ 50	0,17	72	0,29	0,14	0,09	0,06
	≤ 500	≤ 50	0,16	75	0,29	0,14	0,09	0,06
	≤ 750	≤ 50	0,15	78	0,29	0,14	0,09	0,06
	≤ 1000	≤ 50	0,13	80	0,29	0,14	0,09	0,06
67–119	≤ 250	≤ 50	0,53	75	0,53	0,35	0,27	0,22
	≤ 500	≤ 50	0,53	78	0,53	0,35	0,27	0,22
	≤ 750	≤ 50	0,53	81	0,53	0,35	0,27	0,22
	≤ 1000	≤ 50	0,53	83	0,53	0,35	0,27	0,22
120–172	≤ 250	≤ 50	0,40	65	0,42	0,31	0,25	0,22
	≤ 500	≤ 50	0,40	68	0,42	0,31	0,25	0,22
	≤ 750	≤ 50	0,38	72	0,42	0,31	0,25	0,22
	≤ 1000	≤ 50	0,36	75	0,42	0,31	0,25	0,22

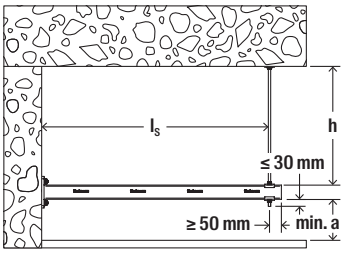
Load tables based on the advisory opinions.



Picture 1



Picture 2

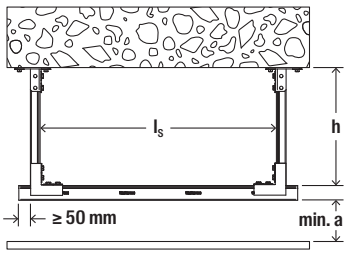


Picture 3

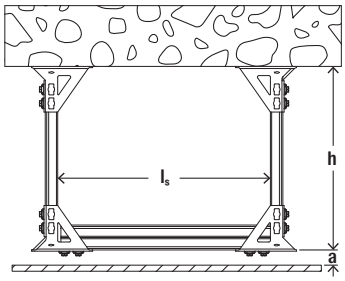
Note: Picture 1 - 3 are valid for FUS/FCA and FLS/ALK load tables

FUS-Channel / FCA-Cantilever arm								
Load table based on the Adivisory Opinion No. GS 3.2/14-175-4 The following figures are valid for FUS channels and FCA cantilever arms, galvanized, hdg and stainless steel.								
FUS/FCA 41/2,5 (Picture 1–3)		**MLAR loads**		**Max. Loads**				
Threaded rods ≥ 4.8		**strain**	**F-resistance**	**Max. strain**	**Fire resistance time [minute]**			
Load case	**ls**	**min a [1)]**	**30**	**min a [2)]**	**30**	**60**	**90**	**120**
	[mm]	**[mm]**	**[kN]**	**[mm]**	**[kN]**	**[kN]**	**[kN]**	**[kN]**
Point load	≤ 400	≤ 50	0,90	278	2,40	1,33	0,92	0,72
	≤ 700	≤ 50	–	320	1,61	1,04	0,80	0,67
Multiple load [3)]	≤ 400	≤ 50	0,90	278	2,40	1,33	0,92	0,72
	≤ 700	≤ 50	–	320	1,61	1,04	0,80	0,67
Uniformly distributed load	≤ 400	≤ 50	1,50	258	3,00	2,10	1,41	1,06
	≤ 700	≤ 50	0,60	299	2,44	1,57	1,21	1,00
	≤ 1250	≤ 50	–	468	3,29	1,81	1,27	0,98
FUS/FCA 62/2,5 (Picture 1–3)		**MLAR loads**		**Max. Loads**				
Threaded rods ≥ 4.8		**strain**	**F-resistance Min.**	**Max. strain**	**Fire resistance time [minute]**			
Load case	**ls**	**min a [1)]**	**30**	**min a [2)]**	**30**	**60**	**90**	**120**
	[mm]	**[mm]**	**[kN]**	**[mm]**	[kN]	**[kN]**	**[kN]**	**[kN]**
Point load	≤ 400	≤ 50	1,76	25	1,76	1,06	0,78	0,62
	≤ 1000	≤ 50	–	460	2,27	1,31	0,93	0,72
Multiple load [3)]	≤ 400	≤ 50	1,76	25	1,76	1,06	0,78	0,62
	≤ 960 [4)]	≤ 50	4,30	550	4,30	2,14	1,39	1,01
	≤ 1000	≤ 50	0,55	661	2,52	1,60	1,21	0,99
Uniformly distributed load	≤ 400	≤ 50	1,76	25	1,76	1,06	0,78	0,62
	≤ 960 [4)]	≤ 50	4,30	550	4,30	2,14	1,39	1,01
	≤ 1000	≤ 50	0,55	661	2,52	1,60	1,21	0,99
	≤ 1250	≤ 50	0,50	592	2,41	1,65	1,31	1,11
FUS 62/2,5 (Picture 4)		**MLAR loads**		**Max. Loads**				
Vertical FUS 41/2,5		**strain**	**F-resistance**	**Max. strain**	**Fire resistance time [minute]**			
Load case	**ls**	**min a [1)]**	**30**	**min a [2)]**	**30**	**60**	**90**	**120**
	[mm]	**[mm]**	**[kN]**	**[mm]**	**[kN]**	**[kN]**	**[kN]**	**[kN]**
Point load	≤ 1000	≤ 50	0,57	369	1,33	0,87	0,68	0,57
Multiple load [3)]	≤ 1000	≤ 50	0,62	649	1,92	1,34	1,08	0,92
	≤ 1000	≤ 50	0,62	649	1,92	1,34	1,08	0,92

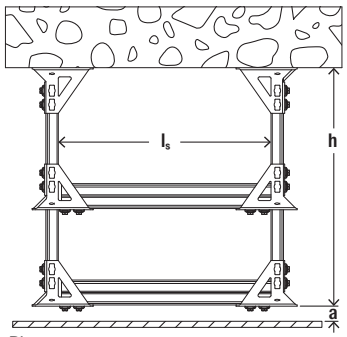
1) Valid for a suspension height ha ^{3} 500 mm
2) Based on suspension height ha = 250mm, Expansion length of threaded rods in case of fire ~ 10mm/m
3) Given load values apply for multiple loads as summated point loads symmetrical allocated
4) This values are valid for FCA 62/2,5 with additional support by threaded rod



Picture 4



Picture 5



Picture 6

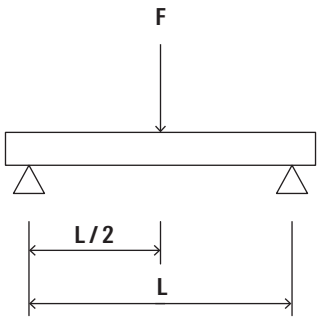
PUWF

Load table PUWF - Frame construction with loads for fire protection application

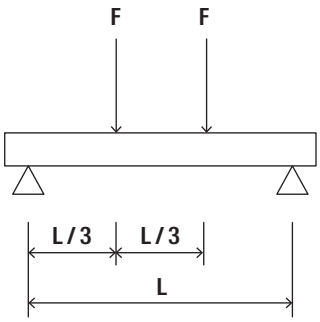
These loads apply with the same height and position/distribution of the mechanical load(s) and with the same bracing height h to smaller widths than the investigated clear width l_s, with the same total height of the mechanical load and the same static system, to a higher number of uniformly distributed concentrated loads than tested, with the same height of each individual mechanical load and the same static system, to less than the tested number of individual loads.

Without intermediate level (picture 5)		**MLAR**		**Maximum loads**			
FUS 41-2,5 / FUS 41D-2,5/ PUWF/ PFCN 41	**Distance**	**Deformation**	**F-duration Min.**	**Fire resistance duration in minutes**			
Load type	**ls***	**min a[1)]**	**30**	**30**	**60**	**90**	**120**
	[mm]	**[mm]**	**[kN]**	**[kN]**	**[kN]**	**[kN]**	**[kN]**
Individual load	1250	≤50	0,592	2,262	1,415	1,133	0,992

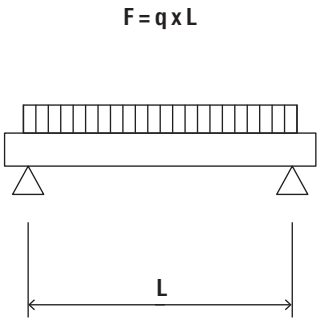
With intermediate level (picture 6)		**MLAR**		**Maximum loads**			
FUS 41-2,5 / FUS 41D-2,5/ PUWF/ PFCN 41	**Distance**	**Deformation**	**F-duration Min.**	**Fire resistance duration in minutes**			
Load type	**ls***	**min a[1)]**	**30**	**30**	**60**	**90**	**120**
	[mm]	**[mm]**	**[kN]**	**[kN]**	**[kN]**	**[kN]**	**[kN]**
Individual load per level	1250	≤50	0,478	1,311	0,805	0,637	0,553
Individual load total			0,956	2,621	1,611	1,274	1,106



Point load
Spot load, e.g. a pipeclamp on the rail.



Uniform load
Uniform distribution of load on the rails, e.g. bend-proof **ventilation duct.**



Multiple load
More than one load point on the rail, e.g. several pipe clamps.

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