



# 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).

## ■ 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 fire-proof sub-ceiling. Therefore a minimum distance of  $\min a \leq 50 \text{ mm}$  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  $> 800 \text{ °C}$  according 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 MPA Braunschweig are available:

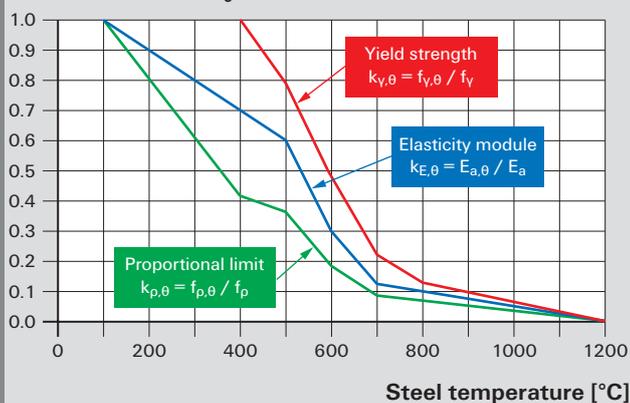
- FRS (Document no. GS 3.2/14-175-2)
- FUS / FCA (Document no. GS3.2/14-175-4)
- FRS-L Universal (Document no. GS 3.2/15-141-3)
- FLS / ALK (Document no. GS 3.2/15-141-4)

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

- SB push bar (F120) inspection report no. 2100051097
- SB sliding carriage (F120) inspection report no. 2100051094
- PDH-K pendulum hangers (F120) inspection report no. 2100051096

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## Reduction factors $k_{\theta}$



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

## Test preparation

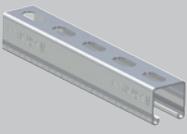
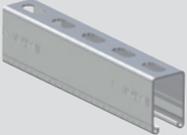


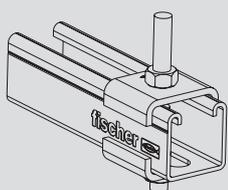
Fire inspection before.



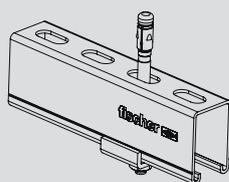
Fire inspection after.

# Product overview with proof in inspection reports and advisory opinions.

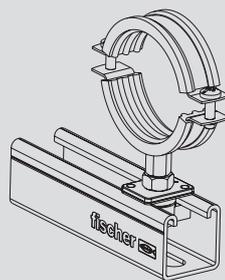
Picture	Product	Document no.	MLAR	R30 - R120	F30 - F120	Picture	Product	Document no.	MLAR	R30 - R120	F30 - F120
	FLS 37	MFPA Leipzig - GS 3.2/15-141-4	●	●			FRS-L Universal	MFPA Leipzig - GS 3.2/15-141-3	●	●	
	FUS 41	MFPA Leipzig - GS 3.2/14-175-4	●	●			FRS	MFPA Leipzig - GS 3.2/14-175-2	●	●	
	FUS 62	MFPA Leipzig - GS 3.2/14-175-4	●	●			SB	MPA-NRW - 210005109-7			●
	ALK 37	MFPA Leipzig - GS 3.2/15-141-4	●	●			SBS	MPA-NRW - 210005109-4	●		●
	FCA 41	MFPA Leipzig - GS 3.2/14-175-4	●	●			PDH-K	MPA-NRW - 210005109-6	●		●
	FCA 62	MFPA Leipzig - GS 3.2/14-175-4	●	●							



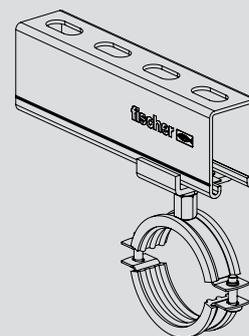
fischer channel washer  
HK 41 (≥ 10,5mm) or  
HK 31 (≥ 8,5mm)



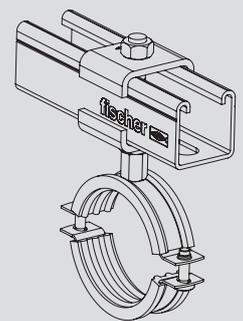
Connection ceiling  
fischer anchor and  
fischer channel washer  
HK 41 (≥ 10,5mm) or  
HK 31 (≥ 8,5mm)



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



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



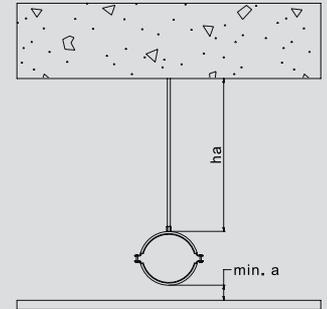
fischer channel washer  
HK 41 (≥ 10,5mm) or  
HK 31 (≥ 8,5mm)

# Load tables based on the advisory opinions.

FRS-F pipe clamps – load table based on the advisory opinion no. GS 3.2/14-175-2

FRS M8 / M10		MLAR		Maximum loads				
Threaded rods $\geq 4.8$		strain	F-resistance	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	$\leq 250$	$\leq 50$	0,56	51	0,56	0,29	0,20	0,15
	$\leq 500$	$\leq 50$	0,56	54				
	$\leq 750$	$\leq 50$	0,56	57				
	$\leq 1000$	$\leq 50$	0,51	60				
72 - 92	$\leq 250$	$\leq 50$	0,65	50	0,79	0,49	0,36	0,29
	$\leq 500$	$\leq 50$	0,62	53				
	$\leq 750$	$\leq 50$	0,59	56				
	$\leq 1000$	$\leq 50$	0,57	59				
108 - 116	$\leq 250$	$\leq 50$	0,48	61	0,63	0,39	0,29	0,23
	$\leq 500$	$\leq 50$	0,43	64				
	$\leq 750$	$\leq 50$	0,39	66				
	$\leq 1000$	$\leq 50$	0,35	69				
121 - 168	$\leq 250$	$\leq 50$	0,96	61	1,00	0,51	0,34	0,25
	$\leq 500$	$\leq 50$	0,89	63				
	$\leq 750$	$\leq 50$	0,82	66				
	$\leq 1000$	$\leq 50$	0,75	69				

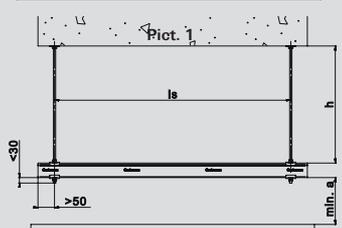
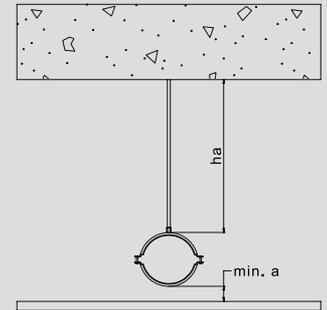
This data are valid for all FRS pipe clamps, galvanized, hdg and stainless steel.



Pipe clamp FRS-L Universal - load table based on the advisory opinion no. GS 3.2/15-141-3

FRS-L Universal M8 / M10		MLAR		Maximum loads				
Threaded rods $\geq 4.8$		strain	F-resistance	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]
8 - 37	$\leq 250$	$\leq 50$	0,27	54	0,27	0,14	0,09	0,07
	$\leq 500$	$\leq 50$	0,26	57				
	$\leq 750$	$\leq 50$	0,24	60				
	$\leq 1000$	$\leq 50$	0,22	62				
38 - 66	$\leq 250$	$\leq 50$	0,17	72	0,29	0,14	0,09	0,06
	$\leq 500$	$\leq 50$	0,16	75				
	$\leq 750$	$\leq 50$	0,15	78				
	$\leq 1000$	$\leq 50$	0,13	80				
67 - 119	$\leq 250$	$\leq 50$	0,53	75	0,53	0,35	0,27	0,22
	$\leq 500$	$\leq 50$	0,53	78				
	$\leq 750$	$\leq 50$	0,53	81				
	$\leq 1000$	$\leq 50$	0,53	83				

This data are valid for all for all FRS-L Universal pipe clamps, galvanized, hdg and stainless steel.



FLS-Channel / ALK-Cantilever arm - load table based on the advisory opinion no. GS 3.2/15-141-4

FUS / FCA 41/2,5 (picture1-3)		MLAR - loads		Max. Loads				
Threaded rods $\geq 4.8$		strain	F-resistance	Max. strain	Fire resistance time [minute]			
Load case	ls	min a	30	min a	30	60	90	120
	[mm]	[mm]	[kN]	[mm]	[kN]	[kN]	[kN]	[kN]
Point load	$\leq 400$ 1)	$\leq 50$	0,24	93	0,24	0,13	0,10	0,09
	$\leq 400$ 2)	$\leq 50$	0,09	389	0,47	0,38	0,33	0,30
	$\leq 400$ 4)	$\leq 50$	0,32	226	1,33	0,78	0,53	0,40
multiple load 3)	$\leq 400$ 1)	$\leq 50$	0,72	93	0,72	0,38	0,30	0,27
	$\leq 400$ 2)	$\leq 50$	0,26	289	1,42	1,13	0,99	0,90
	$\leq 400$ 4)	$\leq 50$	0,81	226	1,33	0,78	0,53	0,40
Uniformly distributed load	$\leq 400$ 1)	$\leq 50$	0,72	93	0,72	0,38	0,30	0,27
	$\leq 400$ 2)	$\leq 50$	0,35	308	1,37	1,19	1,06	0,95
	$\leq 400$ 4)	$\leq 50$	0,81	226	1,33	0,78	0,53	0,40

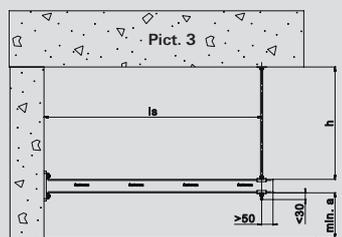
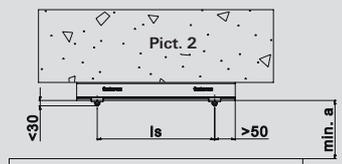
These data are valid for all for FLS channels and ALK cantilever arms, galvanized, hdg and stainless steel.

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  $\sim 10$ 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).

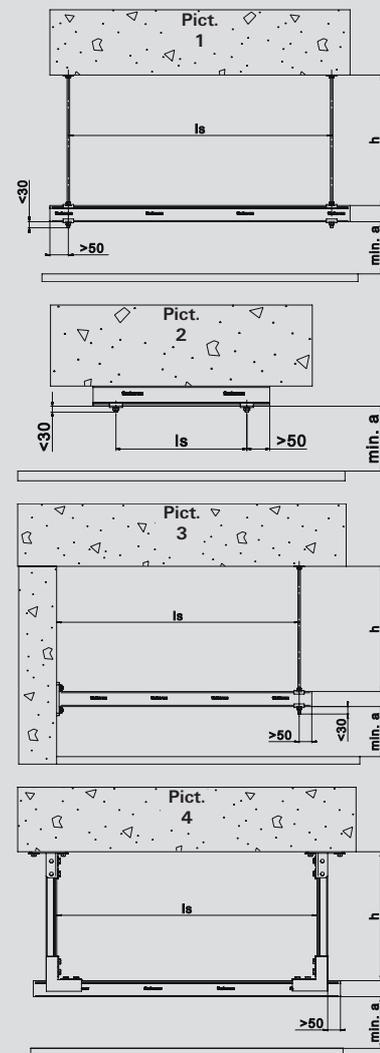


# Load tables based on the advisory opinions.

FUS-Channel / FCA-Cantilever arm - Load table based on the advisory opinion no. GS 3.2/14-175-4								
FUS / FCA 41/2,5 (picture1-3)		MLAR - loads			Max. Loads			
Threaded rods $\geq 4.8$		strain	F-resistance	Max. strain	Fire resistance time [minute]			
Load case	$l_s$ [mm]	min a <sup>1)</sup> [mm]	30 [kN]	min a <sup>2)</sup> [mm]	30 [kN]	60 [kN]	90 [kN]	120 [kN]
Point load	$\leq 400$	$\leq 50$	0,90	278	2,40	1,33	0,92	0,72
	$\leq 700$	$\leq 50$	-	320	1,61	1,04	0,80	0,67
multiple load <sup>3)</sup>	$\leq 400$	$\leq 50$	0,90	278	2,40	1,33	0,92	0,72
	$\leq 700$	$\leq 50$	-	320	1,61	1,04	0,80	0,67
Uniformly distributed load	$\leq 400$	$\leq 50$	1,50	258	3,00	2,10	1,41	1,06
	$\leq 700$	$\leq 50$	0,60	299	2,44	1,57	1,21	1,00
	$\leq 1250$	$\leq 50$	-	468	3,29	1,81	1,27	0,98
FUS / FCA 62/2,5 (Pict. 1-3)		MLAR			Max. Loads			
Threaded rods $\geq 4.8$		strain	F-resistance	Max. strain	Fire resistance time [minute]			
Load case	$l_s$ [mm]	min a <sup>1)</sup> [mm]	30 [kN]	min a <sup>2)</sup> [mm]	30 [kN]	60 [kN]	90 [kN]	120 [kN]
Point load	$\leq 400$	$\leq 50$	1,76	25	1,76	1,06	0,78	0,62
	$\leq 1000$	$\leq 50$	-	460	2,27	1,31	0,93	0,72
multiple load <sup>3)</sup>	$\leq 400$	$\leq 50$	1,76	25	1,76	1,06	0,78	0,62
	$\leq 960^4)$	$\leq 50$	4,30	550	4,30	2,14	1,39	1,01
	$\leq 1000$	$\leq 50$	0,55	661	2,52	1,60	1,21	0,99
Uniformly distributed load	$\leq 400$	$\leq 50$	1,76	25	1,76	1,06	0,78	0,62
	$\leq 960^4)$	$\leq 50$	4,30	550	4,30	2,14	1,39	1,01
	$\leq 1000$	$\leq 50$	0,55	661	2,52	1,60	1,21	0,99
		$\leq 50$	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	$l_s$ [mm]	min a <sup>1)</sup> [mm]	30 [kN]	min a <sup>2)</sup> [mm]	30 [kN]	60 [kN]	90 [kN]	120 [kN]
Point load	$\leq 1000$	$\leq 50$	0,57	369	1,33	0,87	0,68	0,57
multiple load <sup>3)</sup>	$\leq 1000$	$\leq 50$	0,62	649	1,92	1,34	1,08	0,92
Uniformly distributed load	$\leq 1000$	$\leq 50$	0,62	649	1,92	1,34	1,08	0,92

The following figures are valid for FUS channels and FCA cantilever arms, galvanized, hdg and stainless steel.

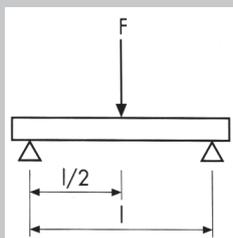
- Valid for a suspension height  $h_a \leq 500$  mm
- Based on suspension height  $h_a = 250$ mm, Expansion length of threaded rods in case of fire  $\sim 10$ mm/m
- Given load values apply for multiple loads as summated point loads symmetrical allocated.
- This values are valid for FCA 62/2,5 with additional support by threaded rod.



## Application possibilities

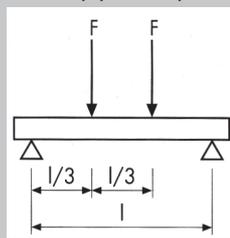
### Point load =

Spot load,  
e.g. a pipe clamp  
on the rail.



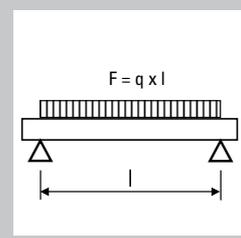
### Multiple load =

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



### Uniformly distributed load =

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



## fischer FIXPERIENCE-INSTALL-FIX. The design and information software suite.



- The modular design program includes engineering software and application modules.
- The software is based on international design standards (ETAG 001 and EC2, such as EC1, EC3 and EC5), including the national application documents. All common force and measurement units are available.
- Incorrect input will be recognized and the software gives tips to get a correct result. This ensures a safe and reliable design every time.
- The graphical display can easily be rotated through 360°, panned, tilted or zoomed as required.
- The 3D display gives a detailed and realistic image.
- The "live update" feature helps to keep the program up to date ensuring you are always working with the latest version.
- Free download and updates at [www.fischer.de/fixperience-en](http://www.fischer.de/fixperience-en)

## Our service to you.



We are available to you at any time as a reliable partner to offer technical support and advice:

- Our products range from chemical resin systems to steel anchors through to nylon anchors.
- Competence and innovation through own research, development and production.
- Global presence and active sales service in over 100 countries.
- Qualified technical consulting for economical and compliant fastening solutions. Also on-site at the construction site if requested.
- Training sessions, some with accreditation, at your premises or at the fischer ACADEMY.
- Design and construction software for demanding applications.

## This is what fischer stands for.



FIXING SYSTEMS



AUTOMOTIVE SYSTEMS



FISCHERTECHNIK



CONSULTING

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