Installation Technical Manual

Technical Challenges

Fire Resistance

Fire Resistance Typicals

Version 1.0 I December 2016

General business conditions / legal information

Hilti continually endeavors to further develop and improve its products and services. As a result, this "Installation Technical Manual – Technical Challenges – Fire resistance" may also be subject to change from time to time. The customer is thus required to regularly check whether a new version of the manual has been made available on the Hilti websites. Only the version of the manual that is currently available on the Hilti websites is considered pertinent. Any and all information and data contained in the manual concern solely the use of Hilti products and are based on the principles, formulas and safety regulations in accordance with Hilti's technical directives and operating, mounting and installation instructions, etc., which must be strictly complied with. The building materials and base materials as well as the environmental conditions vary, all information and data are based upon standards and assumptions that were accepted at the time of their validity. The Hilti product portfolio referred to in the manual can vary from country to country. All the numbers included in the manual are average values. Therefore, application-specific tests must be carried out before using the corresponding Hilti product. The results of the calculations carried out with the help of the manual are essentially based upon the data used by the customer. Therefore the customer is solely responsible for making sure that the data it uses is free of errors, complete and relevant. The customer is also solely responsible for ensuring that the results of the calculation are checked and approved by an expert, in particular with regard to the adherence with the applicable standards and approvals, before the customer uses this for its specific systems/equipment. The manual is designed as an aid for interpreting standards and approvals. It does not guarantee that the results will be free of defects, accurate and relevant, nor does it guarantee the suitability for a specific application. The customer must implement all the required and appropriate measures in order to use the manual as a means of preventing or limiting damage. All the calculation results and construction drafts are recommendations and must be confirmed by a professional builder and/or structural engineer in order to ensure that the calculation results and drafts for the locally applicable legal and project-specific requirements for the customer or for its project are suitable and appropriate.

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

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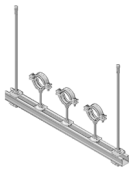

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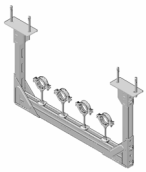

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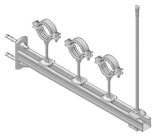

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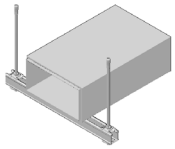

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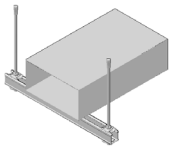

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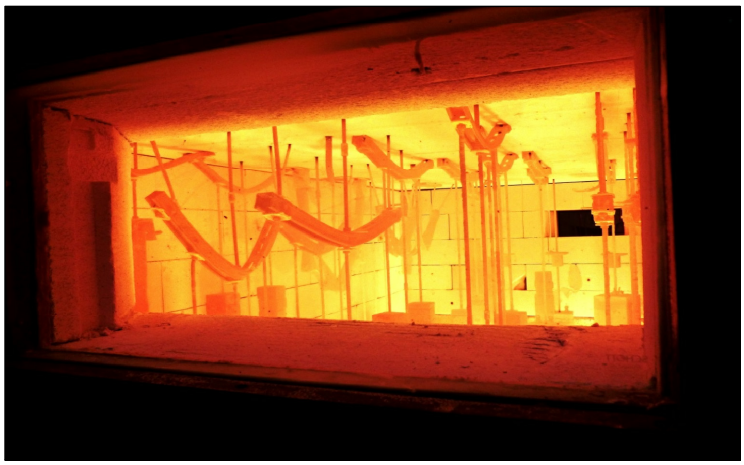
Introduction

Hilti offers a variety of fire-tested products in the areas of fire protection, fastening technology and installation technology, and therefore plays a major role in supporting structural and system fire protection to the effect that the people in the building can be evacuated, while ensuring safe access for the fire department and rescue teams. Protecting the escape and emergency routes is of paramount importance. For this reason, fire protection requirements are becoming increasingly important around the world.

Modern buildings house a variety of mechanical and electrical systems. Fire protection-related systems such as smoke extraction ducts, sprinkler piping and cable runs with functional integrity requirements (e.g. power supply for firestop shutters or ventilation and smoke extraction systems etc.) are crossed in many cases by pipes that are not related to fire protection, or the pipes are laid over a suspended fire protection ceiling due to lack of space. In the event of a fire, if the pipe supports fail or are severely deformed, this can seriously impact the required fire resistance time of the fire protection-related building components that are installed beneath. Therefore the installation positioned above the fire protection-related application (e.g. a suspended ceiling) must be guaranteed to have the same level of fire resistance as the structure below. This also applies in particular to escape and emergency routes where the suspended ceiling often is intended to protect the escape routes against flames and prevent the penetration of smoke and fumes.

A suspended ceiling with fire protection requirements must ensure the required fire resistance time in the event of fire exposure from both above and below. It must be noted that a fire can develop above the suspended ceiling due to the presence of flammable materials, e.g. as a result of retrofitting. Falling pipes and other installation components can damage a fire protection ceiling or cause it to collapse. Furthermore, severe deformations of the suspensions and support structures can result in partial damage to the suspended ceiling and thus impair the ceiling's fire-protection function.

In the event of a fire, if a suspended ceiling is damaged, the smoke that has collected in the ceiling cavity can spread into the areas within the building below. This can make it very difficult or even impossible for the people who are in the affected areas to orient themselves. Subsequently, for the people trying to escape there is a very high risk of fatality due to exposure to smoke and fumes. Therefore, it must be ensured that the function of escape and emergency routes is not affected during the entire required fire resistance time. Support systems installed above must under no circumstances affect the required fire resistance time of fire protection-related equipment or structures installed below, such as cable runs, ventilation, smoke extraction and electrical ducts as well as fire protection ceilings.



Hilti fire-resistance typicals during the fire test

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

How to read this manual

In this manual, you will find the Hilti fire resistant modular support systems typicals. The following pages contains typical applications for pipe and duct supports. These typicals contains axonometric view with description, loading capacity limits and bill of material. For pipe application typicals, pipe rings selection have to be done using pipe rings table that you will find at end of this manual.

All the information used in this manual came from the "**Installation Technical Manual - Technical Challenges - Fire resistance**". There you can find all details, norms and used annexes. For more information, please contact your local Hilti expert for support.

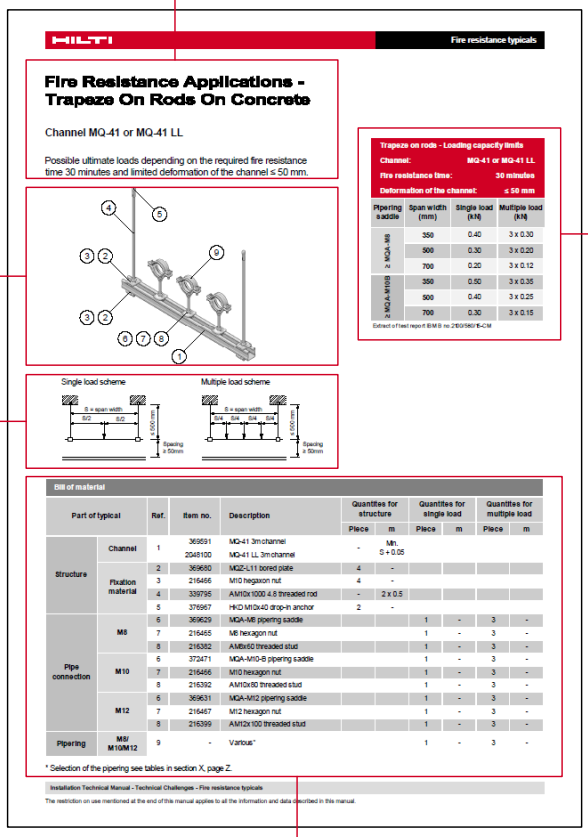
General informations about fire-resistance typical
Include name, used channel or bracket, fire-resistance time and maximum deformation of the channel.

Axonometric view
with references to the bill of materials.

Load schemes
with quantity of load.

Loadind capacity limits
with general informations and possible ultimate loads depending on fire resistance time and with eventually maximum deformation.

Bill of material for one or multiple loads
All item numbers and number of pieces of each item necessary to assemble this application.



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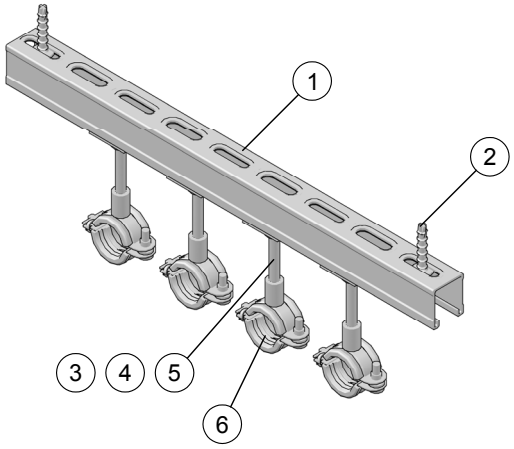
Fire Resistance Applications - Headrail On Concrete

Channel MM-C-36 or MM-C-45

Possible ultimate loads depending on the required fire resistance time 30 minutes and limited deformation of the channel ≤ 50 mm.

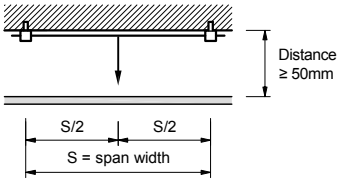


Headrail - Loading capacity limits	
Channel:	MM-C-36 or MM-C-45
Fire resistance time:	30 minutes
Deformation of the channel:	≤ 50 mm

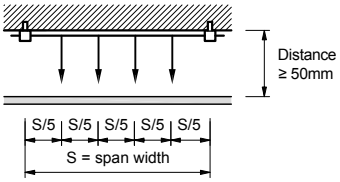
Channel	Span width (mm)	Single load (kN)	Multiple load (kN)
MM-C-36	400	0.15	4 x 0.113
MM-C-45			

Extract of test report IBMB no.(3074/068/12)-CM, Table 2-1to 2-2

Single load scheme



Multiple load scheme



Bill of material

Part of typical		Ref.	Item no.	Description	Quantites for structure		Quantites for single load		Quantites for multiple load	
					Piece	m	Piece	m	Piece	m
Structure	Channel	1	418751 2048104	MM-C-36 3m channel MM-C-45 3m channel	-	0.45				
	Fix. material	2	416745	HUS3-P 6x40/5	2	-				
Pipe connection	M8	3	418760	MM-S M8 pipering saddle			1	-	4	-
		4	216465	M8 hexagon nut			1	-	4	-
		5	216382	AM8x60 threaded stud			1	-	4	-
	M10	3	418761	MM-S M10 pipering saddle			1	-	4	-
		4	216466	M10 hexagon nut			1	-	4	-
		5	216392	AM10x80 threaded stud			1	-	4	-
Pipering	M8/M10	6	-	Various*			1	-	4	-

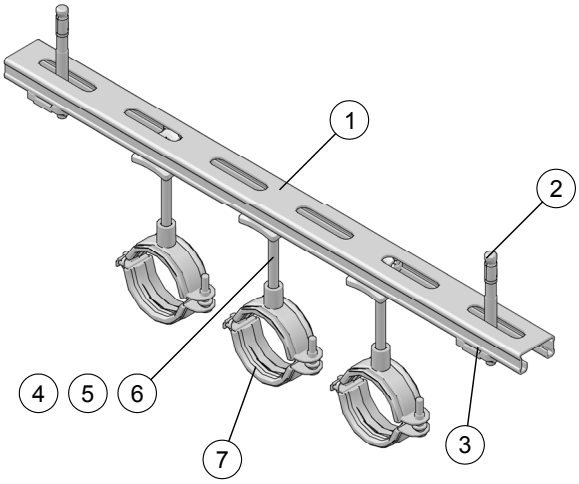
* Selection of the pipering see tables on Page 29 or 30.

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

Fire Resistance Applications - Headrail On Concrete

Channel MQ-21 or MQ-41

Possible ultimate loads depending on the required fire resistance time 30 minutes and limited deformation of the channel ≤ 50 mm.

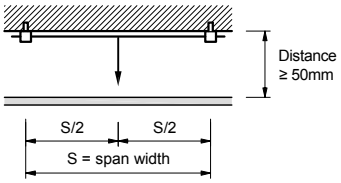


Headrail - Loading capacity limits	
Channel:	MQ-21 or MQ-41
Fire resistance time:	30 minutes
Deformation of the channel:	≤ 50 mm

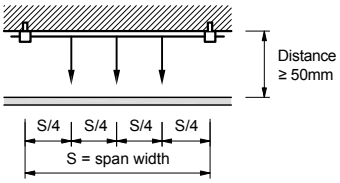
Pipering saddle	Span width (mm)	Single load (kN)	Multiple load (kN)
≥ MQA-M8	350	0.35	3 x 0.25
	500	0.30	3 x 0.20
	700	0.25	3 x 0.15
≥ MQA-M10B	350	0.45	3 x 0.30
	500	0.40	3 x 0.25
	700	0.35	3 x 0.20

Extract of test report IBMB no.2100/580/15-CM, table 3-1

Single load scheme



Multiple load scheme



Bill of material

Part of typical		Ref.	Item no.	Description	Quantites for structure		Quantites for single load		Quantites for multiple load	
					Piece	m	Piece	m	Piece	m
Structure	Channel	1	2148544	MQ-21 3m channel	-	Min. S + 0.05				
			369591	MQ-41 3m channel						
	Fixation material	2	2105714	HST3 M10x110 50/30 anchor *1	2	-				
			2105715	HST3 M10x130 70/50 anchor *2						
		3	369679	MQZ-L11 bored plate	2	-				
Pipe connection	M8	4	369629	MQA-M8 pipering saddle			1	-	3	-
		5	216465	M8 hexagon nut			1	-	3	-
		6	216382	AM8x60 threaded stud			1	-	3	-
	M10	4	372471	MQA-M10-B pipering saddle			1	-	3	-
		5	216466	M10 hexagon nut			1	-	3	-
		6	216392	AM10x80 threaded stud			1	-	3	-
	M12	4	369631	MQA-M12 pipering saddle			1	-	3	-
		5	216467	M12 hexagon nut			1	-	3	-
		6	216399	AM12x100 threaded stud			1	-	3	-
Pipering	M8/M10/M12	7	-	Various *3			1	-	3	-

*1 Anchor for MQ-21 channel

*2 Anchor for MQ-41 channel

*3 Selection of the pipering see tables on Page 29 or 30.

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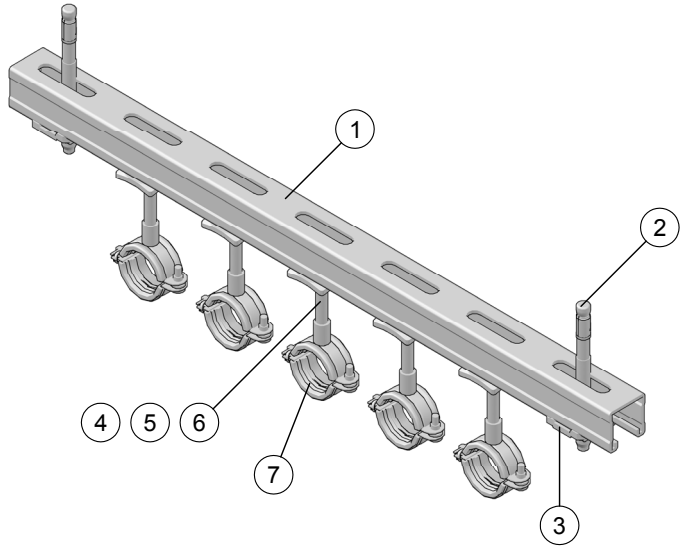
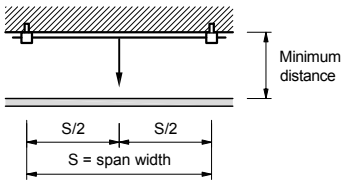
Fire Resistance Applications - Headrail On Concrete

Channel MQ-41/3 or MQ-41/3 LL

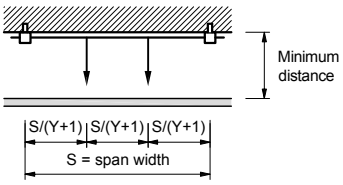
Possible ultimate loads depending on the required fire resistance time.



Single load scheme



Multiple load scheme



Note: Y = quantity of loads

Headrail - Loading capacity limits				
Channel:	MQ-41/3 and MQ-41/3 LL			
Fire resistance time:	30, 60, 90, 120 minutes			
Fire resistant time	**Span width (mm)**	**Single load (kN)**	**Multiple load (kN)**	**Min. distance (mm)**
30 minutes	**350**	1.60	3 x 0.90	55
	500	1.35	4 x 0.58	85
	600	1.10	5 x 0.42	95
	700	1.00	6 x 0.30	100
60 minutes	**350**	0.95	3 x 0.45	55
	500	0.80	4 x 0.31	85
	600	0.70	5 x 0.22	95
	700	0.60	6 x 0.16	100
90 minutes	**350**	0.65	3 x 0.30	55
	500	0.50	4 x 0.19	75
	600	0.45	5 x 0.14	80
	700	0.40	6 x 0.11	80
120 minutes	**350**	0.60	3 x 0.28	55
	500	0.45	4 x 0.17	75
	600	0.40	5 x 0.12	80
	700	0.35	6 x 0.10	80

Extract of test report IBMB no.3054/048/12-CM, Table C-1to C-5

Bill of material

Part of typical		Ref.	Item no.	Description	Quantites for structure		Quantites for single load		Quantites for multiple load	
					Piece	m	Piece	m	Piece	m
Structure	**Channel**	1	369596 2048102	MQ-41/3 3m channel MQ-41/3 LL 3m channel	-	Min. S + 0.10				
	Fixation material	2	2105715	HST3 M10x130 70/50 anchor	2	-				
		3	369679	MQZ-L11 bored plate	2	-				
Pipe connection	**M10**	4	372471	MQA-M10-B pipering saddle			1	-	1 x Y	-
		5	216466	M10 hexagon nut			1	-	1 x Y	-
		6	216392	AM10x80 threaded stud			1	-	1 x Y	-
	M12	4	369631	MQA-M12 pipering saddle			1	-	1 x Y	-
		5	216467	M12 hexagon nut			1	-	1 x Y	-
		6	216399	AM12x100 threaded stud			1	-	1 x Y	-
	M16	4	369632	MQA-M16-B pipering saddle			1	-	1 x Y	-
		5	216468	M16 hexagon nut			1	-	1 x Y	-
		6	212635	AM16x100 threaded stud			1	-	1 x Y	-
Pipering	**M10/ M12/M16**	7	-	Various*			1	-	1 x Y	-

* Selection of the pipering see tables on Page 29 or 30.

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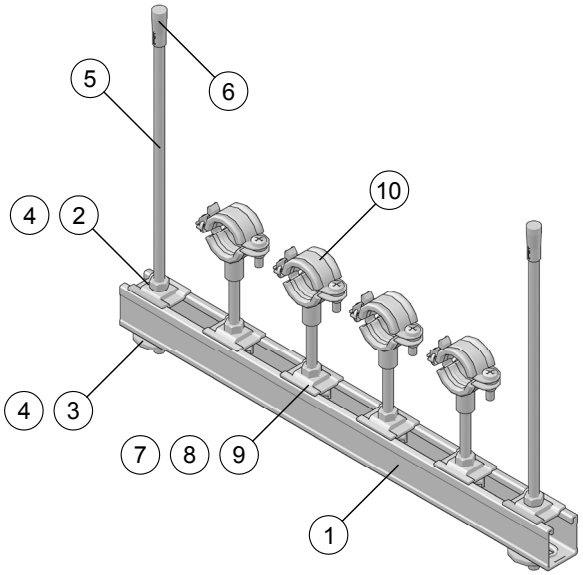
Fire Resistance Applications - Trapeze On Rods On Concrete

Channel MM-C-36 or MM-C-45

Possible ultimate loads depending on the required fire resistance time 30 minutes and limited deformation of the channel ≤ 50 mm.

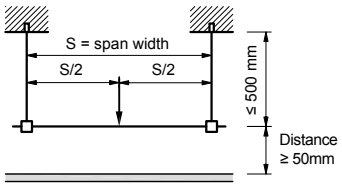


Trapeze on rods - Loading capacity limits	
Channel:	MM-C-36 or MM-C-45
Fire resistance time:	30 minutes
Deformation of the channel:	≤ 50 mm

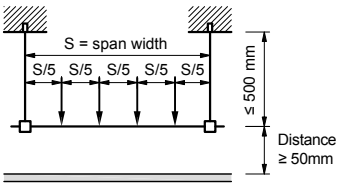
Channel	Span width (mm)	Single load (kN)	Multiple load (kN)
MM-C-36	400	0.25	4 x 0.125
MM-C-45		0.35	4 x 0.175

Extract of test report IBMB no. 3074/068/12-CM , table 2-1to 2-2

Single load scheme



Multiple load scheme



Bill of material

Part of typical		Ref.	Item no.	Description	Quantites for structure		Quantites for single load		Quantites for multiple load	
					Piece	m	Piece	m	Piece	m
Structure	Channel	1	418751	MM-C-36 3m channel	-	0.45				
			2048104	MM-C-45 3m channel						
	Fix. material	2	418770	MM-CW M10 channel w asher	2	-				
		3	282862	A 10.5/28 flat w asher	2	-				
		4	216466	M10 hexagon nut	4	-				
		5	339795	AM10x1000 4.8 threaded rod	1	2 x 0.5				
		6	376967	HKD M10x40 drop-in anchor	2	-				
Pipe connection	M8	7	418760	MM-S M8 pipering saddle			1	-	4	-
		8	216465	M8 hexagon nut			1	-	4	-
		9	216382	AM8x60 threaded stud			1	-	4	-
	M10	7	418761	MM-S M10 pipering saddle			1	-	4	-
		8	216466	M10 hexagon nut			1	-	4	-
		9	216392	AM10x80 threaded stud			1	-	4	-
Pipering	M8/M10	10	-	Various*			1	-	4	-

* Selection of the pipering see tables on Page 29 or 30.

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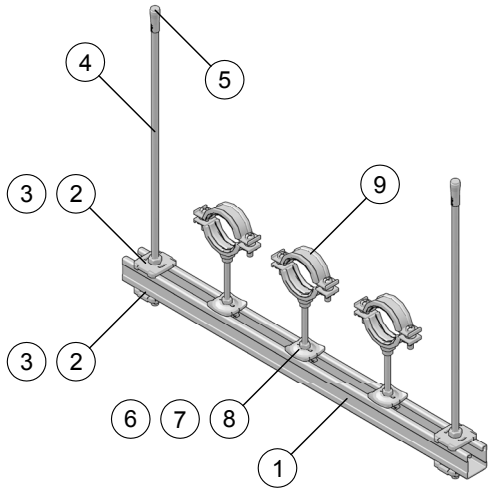
Fire Resistance Applications - Trapeze On Rods On Concrete

Channel MQ-41 or MQ-41 LL

Possible ultimate loads depending on the required fire resistance time 30 minutes and limited deformation of the channel ≤ 50 mm.

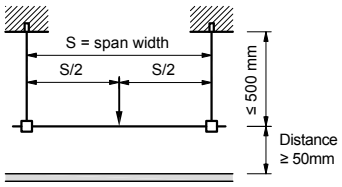


Trapeze on rods - Loading capacity limits	
Channel:	MQ-41 or MQ-41 LL
Fire resistance time:	30 minutes
Deformation of the channel:	≤ 50 mm

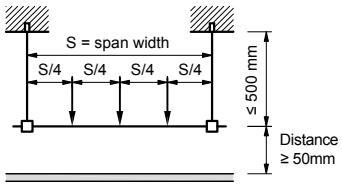
Pipering saddle	Span width (mm)	Single load (kN)	Multiple load (kN)
≥ MQA-M8	350	0.40	3 x 0.30
	500	0.30	3 x 0.20
	700	0.20	3 x 0.12
≥ MQA-M10B	350	0.50	3 x 0.35
	500	0.40	3 x 0.25
	700	0.30	3 x 0.15

Extract of test report IBMB no.2100/580/15-CM

Single load scheme



Multiple load scheme



Bill of material

Part of typical		Ref.	Item no.	Description	Quantites for structure		Quantites for single load		Quantites for multiple load	
					Piece	m	Piece	m	Piece	m
Structure	Channel	1	369591 2048100	MQ-41 3m channel MQ-41 LL 3m channel	-	Min. S + 0.05				
	Fixation material	2	369680	MQZ-L11 bored plate	4	-				
		3	216466	M10 hegaxon nut	4	-				
		4	339795	AM10x1000 4.8 threaded rod	-	2 x 0.5				
		5	376967	HKD M10x40 drop-in anchor	2	-				
Pipe connection	M8	6	369629	MQA-M8 pipering saddle			1	-	3	-
		7	216465	M8 hexagon nut			1	-	3	-
		8	216382	AM8x60 threaded stud			1	-	3	-
	M10	6	372471	MQA-M10-B pipering saddle			1	-	3	-
		7	216466	M10 hexagon nut			1	-	3	-
		8	216392	AM10x80 threaded stud			1	-	3	-
	M12	6	369631	MQA-M12 pipering saddle			1	-	3	-
		7	216467	M12 hexagon nut			1	-	3	-
		8	216399	AM12x100 threaded stud			1	-	3	-
Pipering	M8/ M10/M12	9	-	Various*			1	-	3	-

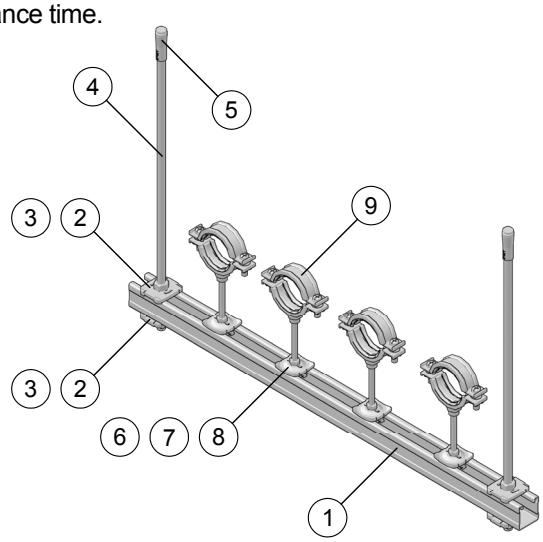
* Selection of the pipering see tables on Page 29 or 30.

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

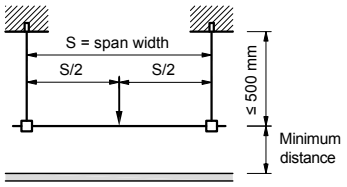
Fire Resistance Applications - Trapeze On Rods On Concrete

Channel MQ-41/3 or MQ-41/3 LL

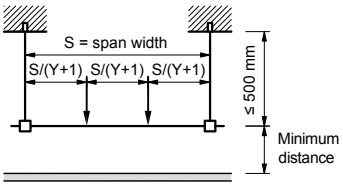
Possible ultimate loads depending on the required fire resistance time.



Single load scheme



Multiple load scheme



Note: Y = Quantity of loads

Trapeze on rods - Loading capacity limits

Channel: MQ-41/3 and MQ-41/3 LL

Fire resistance time: 30, 60, 90, 120 minutes

Fire resistant time	Span width (mm)	Single load		Multiple load	
		Load (kN)	Min. distance (mm)	Load (kN)	Min. distance (mm)
30 minutes	350	1.70	185	3 x 1.06	55
	700	1.70	380	6 x 0.48	240
	1000	1.45	440	9 x 0.27	425
	1250	1.20	495	11 x 0.21	625
60 minutes	350	1.20	170	3 x 0.58	60
	700	1.20	305	6 x 0.25	225
	1000	0.90	395	9 x 0.14	370
	1250	0.85	475	11 x 0.10	530
90 minutes	350	0.80	155	3 x 0.40	70
	700	0.80	295	6 x 0.17	200
	1000	0.70	390	9 x 0.10	345
	1250	0.70	465	11 x 0.07	495
120 minutes	350	0.60	175	3 x 0.31	65
	700	0.60	290	6 x 0.13	195
	1000	0.60	395	9 x 0.07	330
	1250	0.60	475	11 x 0.05	485

Extract of test report IBMB no.3054/048/12-CM, table D-6 to D-25

Bill of material

Part of typical		Ref.	Item no.	Description	Quantites for structure		Quantites for single load		Quantites for multiple load	
					Piece	m	Piece	m	Piece	m
Structure	Channel	1	369596 2048102	MQ-41/3 3m channel MQ-41/3 LL 3m channel	-	Min. S + 0.10				
	Fixation material	2	369680	MQZ-L13 bored plate	4	-				
		3	216467	M12 hegaxon nut	4					
		4	339797	AM12x1000 4.8 threaded rod	-	2 x 0.5				
		5	378544	HKD M12x50 drop-in anchor	2	-				
Pipe connection	M10	6	372471	MQA-M10-B pipering saddle			1	-	1 x Y	-
		7	216466	M10 hexagon nut			1	-	1 x Y	-
		8	216392	AM10x80 threaded stud			1	-	1 x Y	-
	M12	6	369631	MQA-M12 pipering saddle			1	-	1 x Y	-
		7	216467	M12 hexagon nut			1	-	1 x Y	-
		8	216399	AM12x100 threaded stud			1	-	1 x Y	-
	M16	6	369632	MQA-M16-B pipering saddle			1	-	1 x Y	-
		7	216468	M16 hexagon nut			1	-	1 x Y	-
		8	212635	AM16x100 threaded stud			1	-	1 x Y	-
Pipering	M10/ M12/M16	9	-	Various*			1	-	1 x Y	-

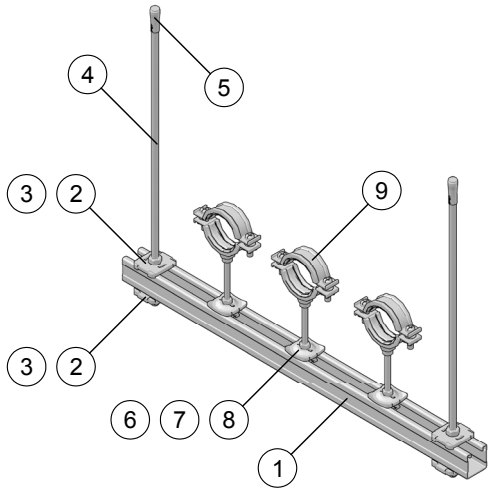
* Selection of the pipering see tables on Page 29 or 30.

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

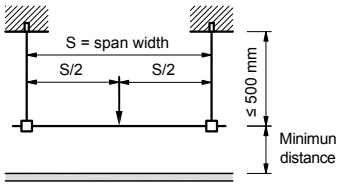
Fire Resistance Applications - Trapeze On Rods On Concrete

Channel MQ-41/3 or MQ-41/3 LL

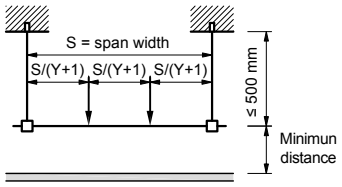
Possible ultimate loads depending on the required fire resistance time 30 minutes and limited deformation of the channel ≤ 50 mm.



Single load scheme



Multiple load scheme



Note: Y = Quantity of loads

Trapeze on rods - Loading capacity limits

Channel:	**MQ-41/3 and MQ-41/3 LL**
Fire resistance time:	**30 minutes**
Deformation of the channel:	**≤ 50 mm**

Fire resistant time	Span width (mm)	Single load (kN)	Multiple load (kN)	Min. distance (mm)
30 minutes	**350**	0.95	3 x 0.55	40
	500	0.55	4 x 0.24	40
	600	0.40	5 x 0.13	40
	700	0.30	6 x 0.10	40

Extract of test report IBMB no.3054/048/12-CM, table B-1to B-4

Bill of material

Part of typical		Ref.	Item no.	Description	Quantites for structure		Quantites for single load		Quantites for multiple load	
					Piece	m	Piece	m	Piece	m
Structure	Channel	1	369596 2048102	MQ-41/3 3m channel MQ-41/3 LL 3m channel	-	Min. S + 0.05				
	Fixation material	2	369680	MQZ-L11 bored plate	4	-				
		3	216466	M10 hegaxon nut	4					
		4	339795	AM10x1000 4.8 threaded rod	-	2 x 0.5				
		5	376967	HKD M10x40 drop-in anchor	2	-				
Pipe connection	M10	6	372471	MQA-M10-B pipering saddle			1	-	1 x Y	-
		7	216466	M10 hexagon nut			1	-	1 x Y	-
		8	216392	AM10x80 threaded stud			1	-	1 x Y	-
	M12	6	369631	MQA-M12 pipering saddle			1	-	1 x Y	-
		7	216467	M12 hexagon nut			1	-	1 x Y	-
		8	216399	AM12x100 threaded stud			1	-	1 x Y	-
	M16	6	369632	MQA-M16-B pipering saddle			1	-	1 x Y	-
		7	216468	M16 hexagon nut			1	-	1 x Y	-
		8	212635	AM16x100 threaded stud			1	-	1 x Y	-
Pipering	M10/ M12/M16	9	-	Various*			1	-	1 x Y	-

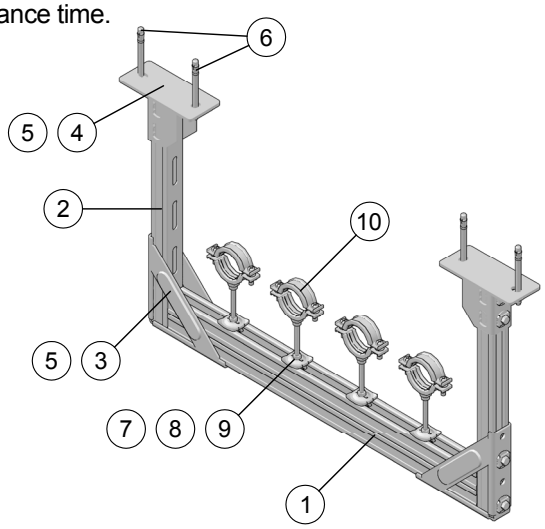
* Selection of the pipering see tables on Page 29 or 30.

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

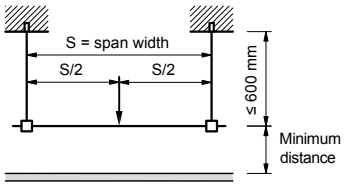
Fire Resistance Applications - Trapeze On Frame On Concrete

Vertical channel MQ-41/3 and horizontal channel MQ-41 D

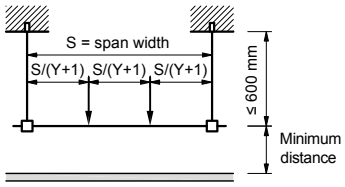
Possible ultimate loads depending on the required fire resistance time.



Single load scheme



Multiple load scheme



Note: Y = Quantity of loads

Trapeze on Frame - Loading capacity limits

Channel: Horizontal MQ-41 D and vertical MQ-41/3

Fire resistance time: 30, 60, 90, 120 minutes

Fire resistant time	Span width (mm)	Single load		Multiple load	
		Load (kN)	Min. distance (mm)	Load (kN)	Min. distance (mm)
30 minutes	700	2.54	284	6 x 0.64	50
	1000	2.46	424	9 x 0.32	124
	1250	1.98	458	11 x 0.24	139
60 minutes	700	1.48	239	6 x 0.45	90
	1000	1.17	234	9 x 0.19	103
	1250	1.00	470	11 x 0.12	97
90 minutes	700	1.09	148	6 x 0.32	110
	1000	0.76	266	9 x 0.14	116
	1250	0.67	355	11 x 0.08	136
120 minutes	700	0.87	161	6 x 0.25	84
	1000	0.56	127	9 x 0.11	122
	1250	0.51	394	11 x 0.06	205

Extract of test report IBMB no.3022/9626-CM, table A-1 to A-4

Bill of material

Part of typical		Ref.	Item no.	Description	Quantites for structure		Quantites for single load		Quantites for multiple load	
					Piece	m	Piece	m	Piece	m
Structure	Channel	1	369603	MQ-41 D 3m channel	-	S				
		2	369596	MQ-41/3 3m channel	-	2 x 0.6				
	Fixation material	3	369665	MQW-S/2 angle	2	-				
		4	369651	MQP-21-72 base plate	2	-				
		5	369623	MQN pushbutton	12	-				
		6	2105718	HST3 M12x105 30/10 stud anchor	4	-				
Pipe connection	M10	7	372471	MQA-M10-B pipering saddle			1	-	1 x Y	-
		8	216466	M10 hexagon nut			1	-	1 x Y	-
		9	216392	AM10x80 threaded stud			1	-	1 x Y	-
	M12	7	369631	MQA-M12 pipering saddle			1	-	1 x Y	-
		8	216467	M12 hexagon nut			1	-	1 x Y	-
		9	216399	AM12x100 threaded stud			1	-	1 x Y	-
	M16	7	369632	MQA-M16-B pipering saddle			1	-	1 x Y	-
		8	216468	M16 hexagon nut			1	-	1 x Y	-
		9	212635	AM16x100 threaded stud			1	-	1 x Y	-
Pipering	M10/ M12/M16	10	-	Various*			1	-	1 x Y	-

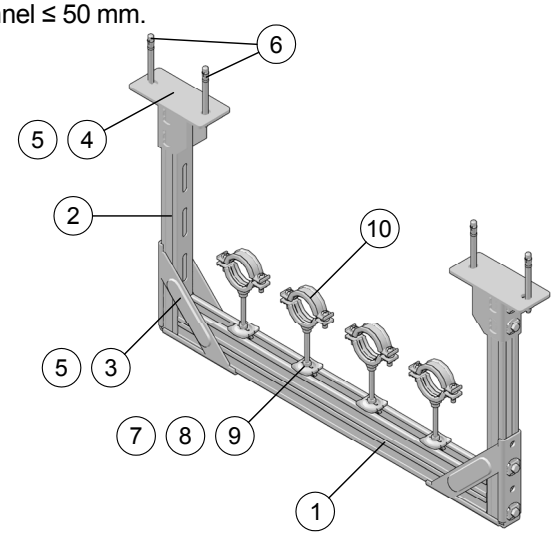
* Selection of the pipering see tables on Page 29 or 30.

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

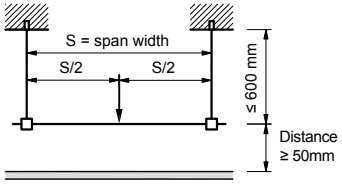
Fire Resistance Applications - Trapeze On Frame On Concrete

Vertical channel MQ-41/3 and horizontal channel MQ-41 D

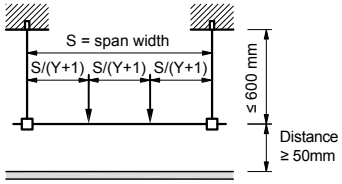
Possible ultimate loads depending on the required fire resistance time 30 minutes and limited deformation of the channel ≤ 50 mm.



Single load scheme



Multiple load scheme



Note: Y = Quantity of loads

Trapeze on Frame - Loading capacity limits	
Channel:	Horizontal MQ-41 D and vertical MQ-41/3
Fire resistance time:	30 minutes
Deformation of the channel:	≤ 50 mm

Fire resistant time	Span width (mm)	Single load (kN)	Multiple load (kN)
30 minutes	700	1.20	6 x 0.64
	1000	0.60	9 x 0.15
	1250	0.30	11 x 0.07

Extract of test report IBMB no.3022/9626-CM, table A-5

Bill of material

Part of typical		Ref.	Item no.	Description	Quantites for structure		Quantites for single load		Quantites for multiple load	
					Piece	m	Piece	m	Piece	m
Structure	Channel	1	369603	MQ-41 D 3m channel	-	S				
		2	369596	MQ-41/3 3m channel	-	2 x 0.6				
	Fixation material	3	369665	MQW-S/2 angle	2	-				
		4	369651	MQP-21-72 base plate	2	-				
		5	369623	MQN pushbutton	12	-				
		6	2105718	HST3 M12x105 30/10 stud anchor	4	-				
Pipe connection	M10	7	372471	MQA-M10-B pipering saddle			1	-	1 x Y	-
		8	216466	M10 hexagon nut			1	-	1 x Y	-
		9	216392	AM10x80 threaded stud			1	-	1 x Y	-
	M12	7	369631	MQA-M12 pipering saddle			1	-	1 x Y	-
		8	216467	M12 hexagon nut			1	-	1 x Y	-
		9	216399	AM12x100 threaded stud			1	-	1 x Y	-
	M16	7	369632	MQA-M16-B pipering saddle			1	-	1 x Y	-
		8	216468	M16 hexagon nut			1	-	1 x Y	-
		9	212635	AM16x100 threaded stud			1	-	1 x Y	-
Pipering	M10/ M12/M16	10	-	Various*			1	-	1 x Y	-

* Selection of the pipering see tables on Page 29 or 30.

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

Fire Resistance Applications - Suspened Bracket On Concrete

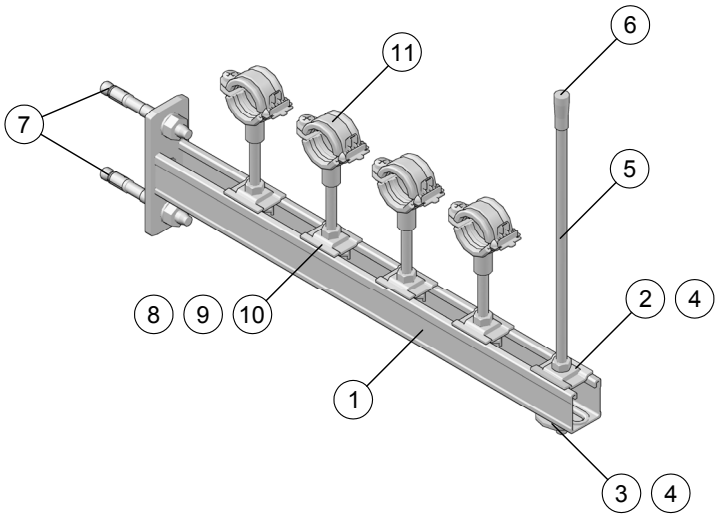
Bracket MM-B-36

Possible ultimate loads depending on the required fire resistance time 30 minutes and limited deformation of the channel ≤ 50 mm.

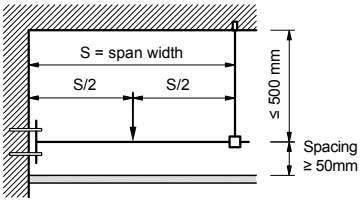
Suspended Bracket - Loading capacity limits	
Bracket:	MM-B-36/450
Fire resistance time:	30 minutes
Deformation of the channel:	≤ 50 mm

Channel	Span width (mm)	Single load (kN)	Multiple load (kN)
MM-B-36/450	400	0.25	4 x 0.125

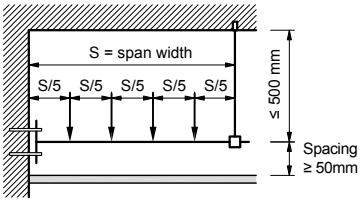
Extract of test report IBMB no.(3074/068/12)-CM, Table 2-1to 2-2



Single load scheme



Multiple load scheme



Bill of material

Part of typical		Ref.	Item no.	Description	Quantites for structure		Quantites for single load		Quantites for multiple load	
					Piece	m	Piece	m	Piece	m
Structure	Bracket	1	418755	MM-B-36/450 bracket	1	-				
	Fixation material	2	418769	MM-CW M8 channel w asher	1	-				
		3	282856	A 8.4/40 flat w asher	1	-				
		4	216465	M8 hexagon nut	2	-				
		5	339793	AM8x1000 4.8 threaded rod	-	0.5				
		6	376959	HKD M8x30 drop-in anchor	1	-				
		7	2105712	HST3 M10x90 30/10 stud anchor	2	-				
Pipe connection	M8	8	418760	MM-S M8 pipering saddle			1	-	4	-
		9	216465	M8 hexagon nut			1	-	4	-
		10	216382	AM8x60 threaded stud			1	-	4	-
	M10	8	418761	MM-S M10 pipering saddle			1	-	4	-
		9	216466	M10 hexagon nut			1	-	4	-
		10	216392	AM10x80 threaded stud			1	-	4	-
Pipering	M8/M10	11	-	Various*			1	-	4	-

* Selection of the pipering see tables on Page 29 or 30.

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

Fire Resistance Applications - Suspended Bracket On Concrete

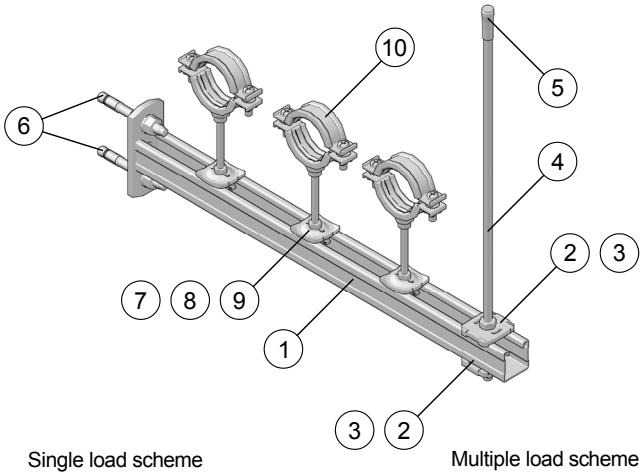
Bracket MQK-41

Possible ultimate loads depending on the required fire resistance time 30 minutes and limited deformation of the channel ≤ 50 mm.

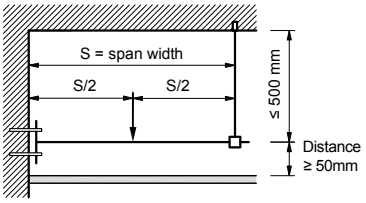
Suspended Bracket - Loading capacity limits	
Bracket:	MQK-41
Fire resistance time:	30 minutes
Deformation of the channel:	≤ 50 mm

Pipering saddle	Span width (mm)	Single load (kN)	Multiple load (kN)
≥ MQA-M8	350	0.40	3 x 0.30
	500	0.30	3 x 0.20
	600	0.20	3 x 0.12
≥ MQA-M10B	350	0.50	3 x 0.35
	500	0.40	3 x 0.25
	600	0.30	3 x 0.15

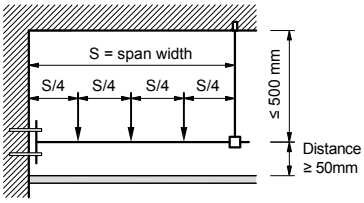
Extract of test report IBMB no.2100/580/15-CM, table 3-1



Single load scheme



Multiple load scheme



Bill of material

Part of typical		Ref.	Item no.	Description	Quantites for structure		Quantites for single load		Quantites for multiple load	
					Piece	m	Piece	m	Piece	m
Structure	Bracket	1	369610	MQK-41/450 bracket	1	-				
			369611	MQK-41/600 bracket						
	Fixation material	2	369680	MQZ-L11 bored plate	2	-				
		3	216466	M10 hegaxon nut	2	-				
		4	339795	AM10x1000 4.8 threaded rod	-	1 x 0.5				
		5	376967	HKD M10x40 drop-in anchor	1	-				
		6	2105718	HST3 M12x105 30/10 stud anchor	2	-				
Pipe connection	M8	7	369629	MQA-M8 pipering saddle			1	-	3	-
		8	216465	M8 hexagon nut			1	-	3	-
		9	216382	AM8x60 threaded stud			1	-	3	-
	M10	7	372471	MQA-M10-B pipering saddle			1	-	3	-
		8	216466	M10 hexagon nut			1	-	3	-
		9	216392	AM10x80 threaded stud			1	-	3	-
	M12	7	369631	MQA-M12 pipering saddle			1	-	3	-
		8	216467	M12 hexagon nut			1	-	3	-
		9	216399	AM12x100 threaded stud			1	-	3	-
Pipering	M8/ M10/M12	10	-	Various*			1	-	3	-

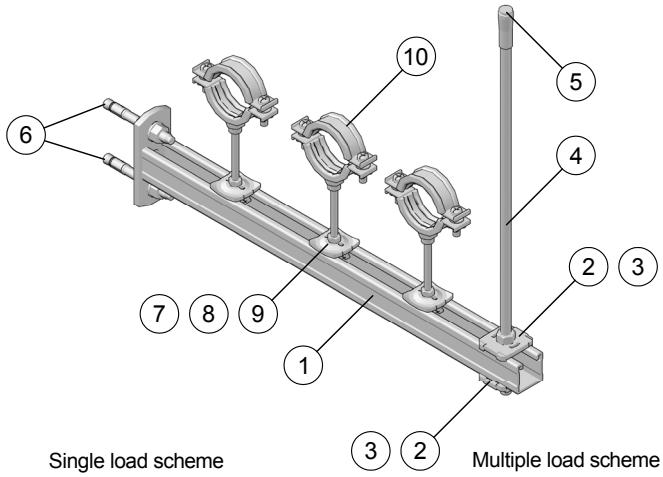
* Selection of the pipering see tables on Page 29 or 30.

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

Fire Resistance Applications - Suspended Bracket On Concrete

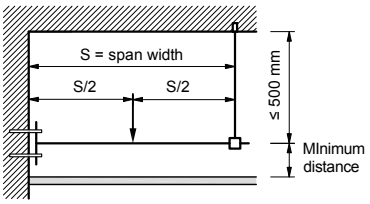
Bracket MQK-41/3

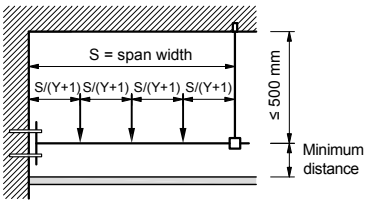
Possible ultimate loads depending on the required fire resistance time.



Single load scheme

Multiple load scheme





Note: Y = Quantity of loads

Suspended Bracket - Loading capacity limits				
Bracket:				MQK-41/3
Fire resistance time:				30, 60, 90, 120 minutes
Fire resistant time	**Span width (mm)**	**Single load (kN)**	**Multiple load (kN)**	**Min. distance (mm)**
30 minutes	350	1.70	3 x 1.06	185
	500	1.70	4 x 0.76	270
	600	1.70	5 x 0.59	325
60 minutes	350	1.20	3 x 0.58	170
	500	1.20	4 x 0.40	230
	600	1.20	5 x 0.31	270
90 minutes	350	0.80	3 x 0.40	155
	500	0.80	4 x 0.28	270
	600	0.80	5 x 0.21	260
120 minutes	350	0.60	3 x 0.31	175
	500	0.60	4 x 0.22	230
	600	0.60	5 x 0.16	260

Extract of test report IBMB no.3054/048/12-CM, Table C-1to C-5

Bill of material

Part of typical		Ref.	Item no.	Description	Quantites for structure		Quantites for single load		Quantites for multiple load	
					Piece	m	Piece	m	Piece	m
Structure	Bracket	1	370596 370597	MQK-41/3/450 bracket MQK-41/3/600 bracket	1	-				
	Fixation material	2	369680	MQZ-L13 bored plate	2	-				
		3	216467	M12 hegaxon nut	2	-				
		4	339797	AM12x1000 4.8 threaded rod	-	1 x 0.5				
		5	378544	HKD M12x50 drop-in anchor	1	-				
		6	2105718	HST3 M12x105 30/10 stud anchor	2	-				
Pipe connection	M10	7	372471	MQA-M10-B pipering saddle			1	-	1 x Y	-
		8	216466	M10 hexagon nut			1	-	1 x Y	-
		9	216392	AM10x80 threaded stud			1	-	1 x Y	-
	M12	7	369631	MQA-M12 pipering saddle			1	-	1 x Y	-
		8	216467	M12 hexagon nut			1	-	1 x Y	-
		9	216399	AM12x100 threaded stud			1	-	1 x Y	-
	M16	7	369632	MQA-M16-B pipering saddle			1	-	1 x Y	-
		8	216468	M16 hexagon nut			1	-	1 x Y	-
		9	212635	AM16x100 threaded stud			1	-	1 x Y	-
Pipering	M10/ M12/M16	10	-	Various*			1	-	1 x Y	-

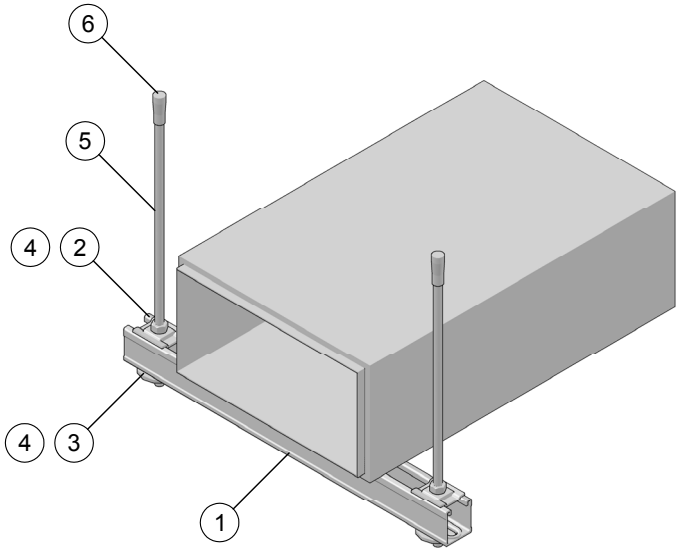
* Selection of the pipering see tables on Page 29 or 30.

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

Fire Resistance Applications - Rigid duct On Concrete

Channel MM-C-36 or MM-C-45

Possible ultimate loads depending on the required fire resistance time 30 minutes and limited deformation of the channel ≤ 50 mm.

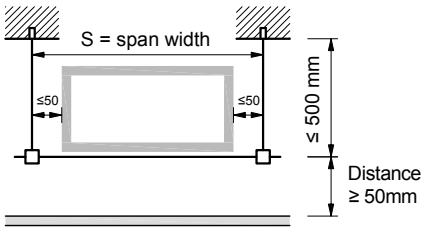


Rigid duct - Loading capacity limits	
Channel:	MM-C-36 and MM-C-45
Fire resistance time:	30 minutes
Deformation of the channel:	≤ 50 mm

Fire resistant time	Span width (mm)	Equal load (∑ equally distributed load) Load (kN)
MM-C-36	400	0.50
	700	0.35
MM-C-45	400	1.00
	700	0.50

Extract of test report IBMB no. 3074/068/12-CM , table 2-1to 2-2

Equal load scheme



Bill of material

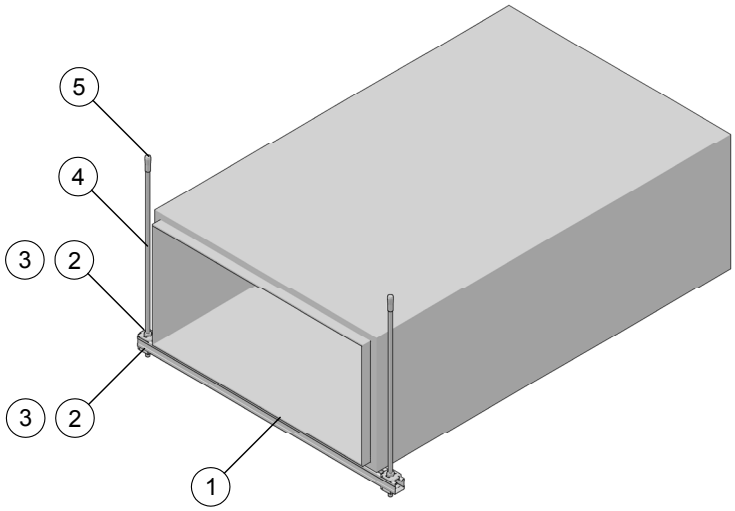
Part of typical		Ref.	Item no.	Description	Quantites for structure	
					Piece	m
Structure	Channel	1	418751 2048104	MM-C-36 3m channel MM-C-45 3m channel	-	S + 0.05
	Fixation material	2	418769	MM-CW M8 channel w asher	2	-
		3	282861	A 8.4/28 flat w asher	2	-
		4	216465	M8 hexagon nut	4	-
		5	339793	AM8x1000 4.8 threaded rod	-	2 x 0.5
		6	376959	HKD M8x30 drop-in anchor	2	-

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

Fire Resistance Applications - Rigid duct On Concrete

Channel MQ-41 or MQ-41 LL

Possible ultimate loads depending on the required fire resistance time.

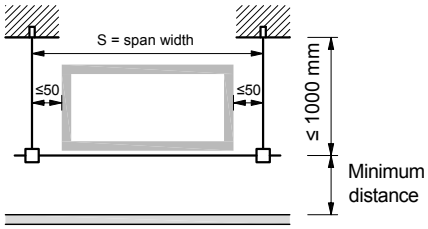


Rigid duct - Loading capacity limits	
Channel:	MQ-41 and MQ-41 LL
Fire resistance time:	30, 60, 90 minutes

Fire resistant time	Span width (mm)	Equal load (∑ equally distributed load)	
		Load (kN)	Min. distance (mm)
30 minutes	≤ 1250mm	2.4	100
		1.7	65
		1.3	50
60 minutes		1.7	105
		1.3	65
		1.0	50
90 minutes		1.3	110
		1.0	80

Extract of test report IBMB no. 3054/048/12-CM , table D-26 to D-27

Equal load scheme



Bill of material

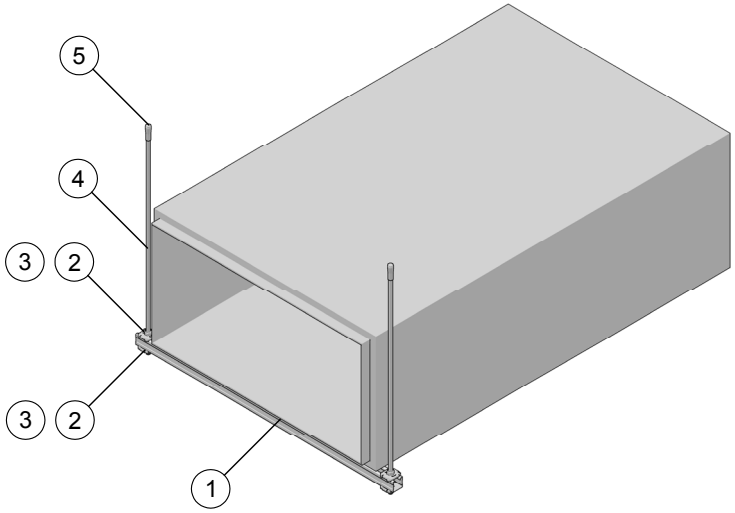
Part of typical		Ref.	Item no.	Description	Quantites for structure	
					Piece	m
Structure	Channel	1	369591 2048100	MQ-41 3m channel MQ-41 LL 3m channel	-	Min. S + 0.05
	Fixation material	2	369680	MQZ-L11 bored plate	4	-
		3	216466	M10 hegaxon nut	4	-
		4	339795	AM10x1000 4.8 threaded rod	-	2 x 1
		5	376967	HKD M10x40 drop-in anchor	2	-

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

Fire Resistance Applications - Rigid duct On Concrete

Channel MQ-41/3 or MQ-41/3 LL

Possible ultimate loads depending on the required fire resistance time.

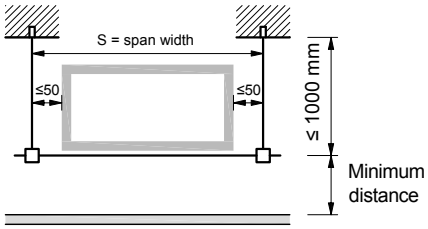


Rigid duct - Loading capacity limits	
Channel:	MQ-41/3 and MQ-41/3 LL
Fire resistance time:	30, 60, 90 minutes

Fire resistant time	Span width (mm)	Equal load (∑ equally distributed load)	
		Load (kN)	Min. distance (mm)
30 minutes	≤ 1250 mm	3.2	100
		1.9	65
		1.4	50
60 minutes		1.9	105
		1.4	65
		1.1	50
90 minutes		1.4	110
		1.1	80

Extract of test report IBMB no. 3054/048/12-CM , table D-26

Equal load scheme



Bill of material

Part of typical		Ref.	Item no.	Description	Quantites for structure	
					Piece	m
Structure	Channel	1	369596	MQ-41/3 3m channel	-	Min. S + 0.05
			2048102	MQ-41/3 LL 3m channel		
	Fixation material	2	369680	MQZ-L13 bored plate	4	-
		3	216467	M12 hegaxon nut	4	-
		4	339797	AM12x1000 4.8 threaded rod	-	2 x 1.0
		5	378544	HKD M12x50 drop-in anchor	2	-

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

Fire Resistance Applications - Rigid duct On Concrete

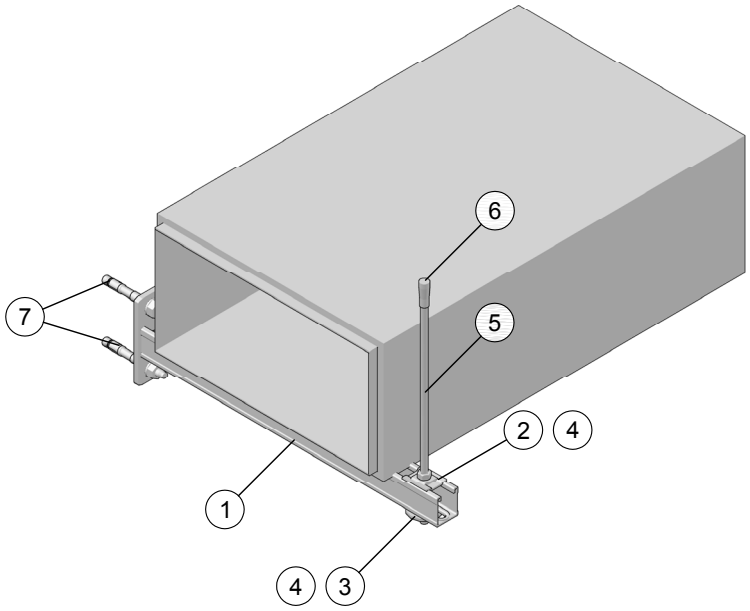
Bracket MM-B-36

Possible ultimate loads depending on the required fire resistance time 30 minutes and limited deformation of the channel ≤ 50 mm.

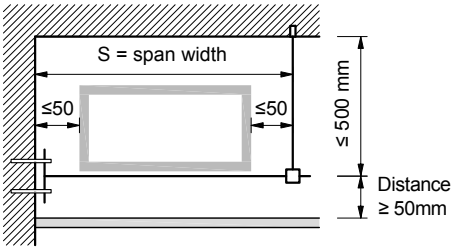
Rigid duct - Loading capacity limits	
Bracket:	MM-B-36
Fire resistance time:	30 minutes
Deformation of the channel:	≤ 50 mm

Channel:	Span width (mm)	Equal load (∑ equally distributed load)
		Load (kN)
MM-B-36	400	0.5

Extract of test report IBMB no. 3074/068/12-CM , table 2-1to 2-2



Equal load scheme



Bill of material

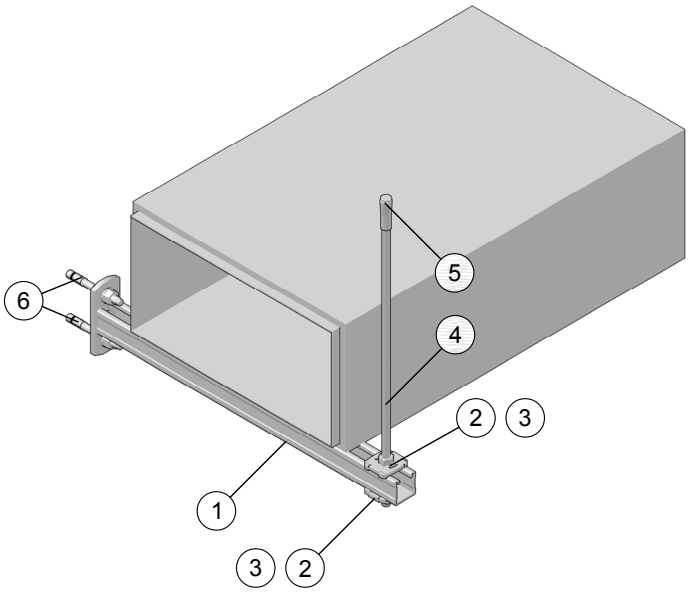
Part of typical		Ref.	Item no.	Description	Quantites for structure	
					Piece	m
Structure	Bracket	1	418755	MM-B-36/450 bracket	1	-
	Fixation material	2	418769	MM-CW M8 channel w asher	1	-
		3	282856	A 8.4/40 flat w asher	1	-
		4	216465	M8 hexagon nut	2	
		5	339793	AM8x1000 4.8 threaded rod	-	0.5
		6	376959	HKD M8x30 drop-in anchor	1	-
		7	2105712	HST3 M10x90 30/10 stud anchor	2	-

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

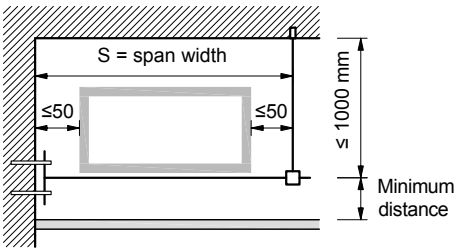
Fire Resistance Applications - Rigid Duct On Concrete

Bracket MQK-41 or MQK-41/3

Possible ultimate loads depending on the required fire resistance time.



Equal load scheme



Rigid duct - Loading capacity limits				
Bracket:	MQK-41 and MQK-41/3			
Fire resistance time:	30, 60, 90 minutes			

Fire resistant time	Span width (mm)	Equal load (∑ equally distributed load)			
		Load (kN)		Min. distance (mm)	
		MQK-41/600	MQK-41/3/600	MQK-41/600	MQK-41/3/600
30 minutes	600 mm	2.4	3.2	100	
		1.7	1.9	65	
		1.3	1.4	50	
60 minutes		1.7	1.9	105	
		1.3	1.4	65	
		1.0	1.1	50	
90 minutes		1.3	1.4	110	
		1.0	1.1	80	

Extract of test report IBMB no. 3054/048/12-CM , table D-26 to D-27

Bill of material

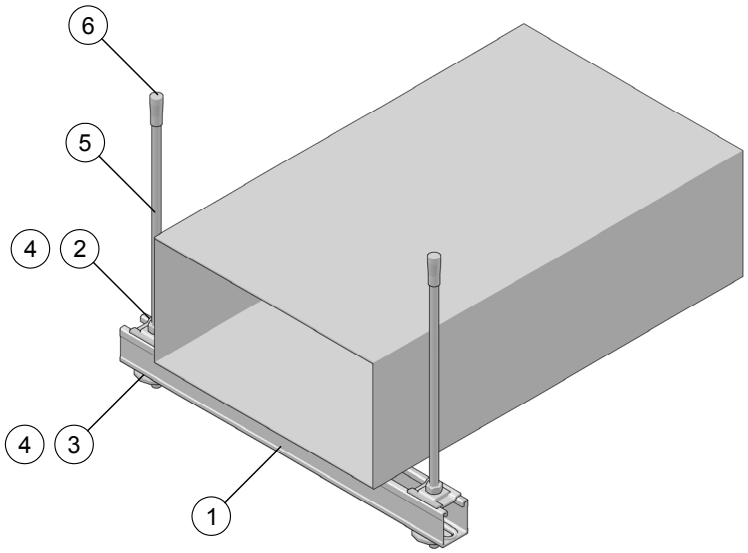
Part of typical		Ref.	Item no.	Description	Quantites for structure	
					Piece	m
Structure	Bracket	1	369611 370597	MQK-41/600 bracket MQK-41/3/600 bracket	1	-
	Fixation material	2	369680	MQZ-L13 bored plate	2	-
		3	216467	M12 hegaxon nut	2	-
		4	339797	AM12x1000 4.8 threaded rod	-	1
		5	378544	HKD M12x50 drop-in anchor	1	-
		6	2105718	HST3 M12x105 30/10 stud anchor	2	-

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

Fire Resistance Applications - Flexible Duct On Concrete

Channel MM-C-36 or MM-C-45

Possible ultimate loads depending on the required fire resistance time 30 minutes and limited deformation of the channel ≤ 50 mm.

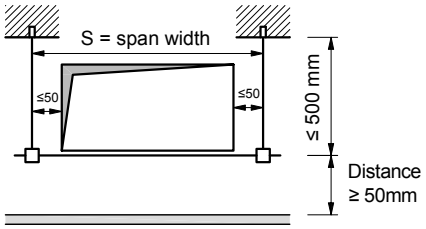


Flexible duct - Loading capacity limits	
Channel:	MM-C-36 and MM-C-45
Fire resistance time:	30 minutes
Deformation of the channel:	≤ 50 mm

Channel:	Span width (mm)	Equal load (∑ equally distributed load) Load (kN)
MM-C-36	400	0.50
	700	0.35
MM-C-45	400	1.00
	700	0.50

Extract of test report IBMB no. 3074/068/12-CM , table 2-1to 2-2

Equal load scheme



Bill of material

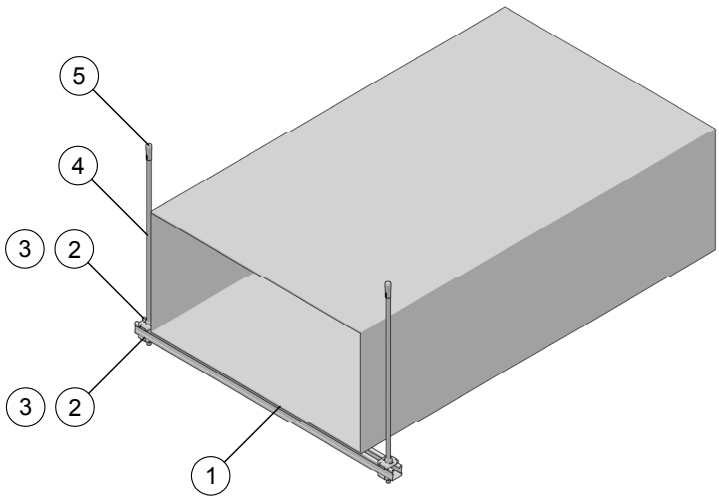
Part of typical		Ref.	Item no.	Description	Quantites for structure	
					Piece	m
Structure	Channel	1	418751	MM-C-36 3m channel	-	S + 0.05
			2048104	MM-C-45 3m channel		
	Fixation material	2	418769	MM-CW M8 channel w asher	2	-
		3	282861	A 8.4/28 flat w asher	2	-
		4	216465	M8 hexagon nut	4	-
		5	339793	AM8x1000 4.8 threaded rod	-	2 x 0.5
		6	376959	HKD M8x30 drop-in anchor	2	-

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

Fire Resistance Applications - Flexible Duct On Concrete

Channel MQ-41 or MQ-41 LL

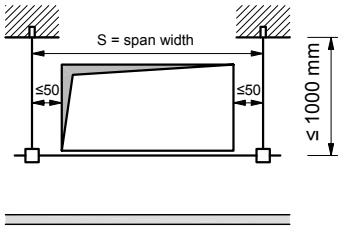
Possible ultimate loads depending on the required fire resistance time.



Flexible duct - Loading capacity limits		
Channel:		MQ-41 and MQ-41 LL
Fire resistance time:		30, 60, 90 minutes
Fire resistant time	Span width (mm)	Equal load (∑ equally distributed load) Load (kN)
30 minutes	≤ 1250mm	2.40
		1.70
		1.30
60 minutes		1.70
		1.30
		1.00
90 minutes		1.30
		1.00

Extract of test report IBMB no. 3054/048/12-CM , table D-27

Equal load scheme



Bill of material

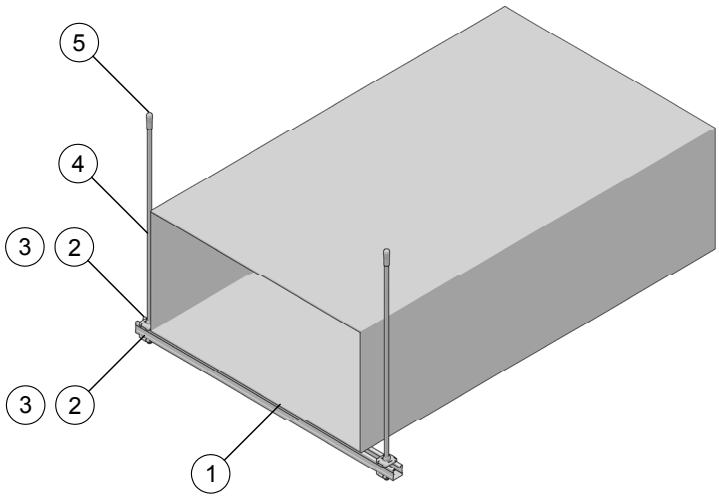
Part of typical		Ref.	Item no.	Description	Quantites for structure	
					Piece	m
Structure	Channel	1	369591	MQ-41 3m channel	-	Min. S + 0.05
			2048100	MQ-41 LL 3m channel		
	Fixation material	2	369680	MQZ-L11 bored plate	4	-
		3	216466	M10 hegaxon nut	4	-
		4	339795	AM10x1000 4.8 threaded rod	-	2 x 1
		5	376967	HKD M10x40 drop-in anchor	2	-

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

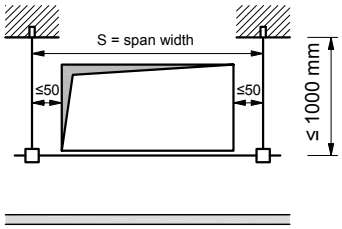
Fire Resistance Applications - Flexible Duct On Concrete

Channel MQ-41/3 or MQ-41/3 LL

Possible ultimate loads depending on the required fire resistance time.



Equal load scheme



Flexible duct - Loading capacity limits	
Channel:	MQ-41/3 and MQ-41/3 LL
Fire resistance time:	30, 60, 90, 120 minutes

Fire resistant time	Span width (mm)	Equal load (∑ equally distributed load)
		Load (kN)
30 minutes	≤ 350	3.40
	≤ 700	3.00
	≤ 1000	2.65
	≤ 1250	2.50
60 minutes	≤ 350	2.10
	≤ 700	1.60
	≤ 1000	1.35
	≤ 1250	1.25
90 minutes	≤ 350	1.50
	≤ 700	1.10
	≤ 1000	0.95
	≤ 1250	0.85
120 minutes	≤ 350	1.20
	≤ 700	0.85
	≤ 1000	0.70
	≤ 1250	0.65

Extract of test report IBMB no. 3054/048/12-CM , table D-6 to D-9

Bill of material

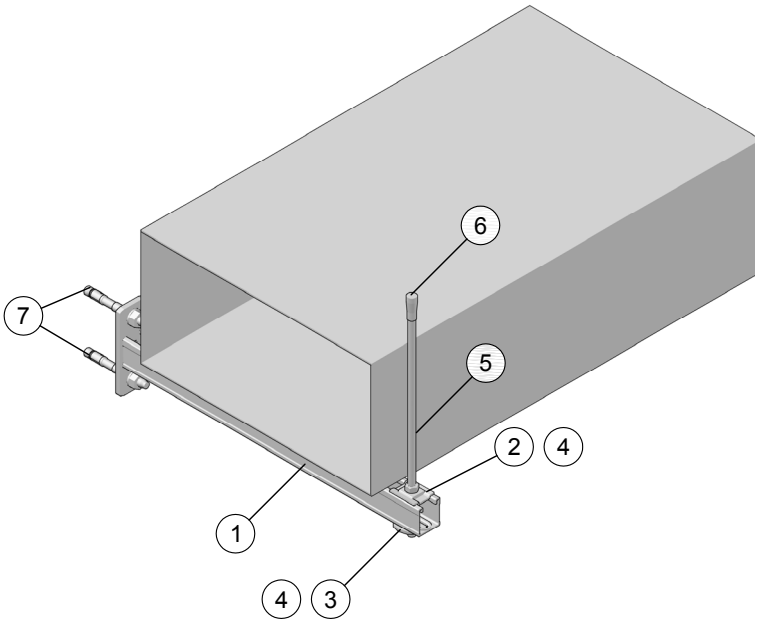
Part of typical		Ref.	Item no.	Description	Quantites for structure	
					Piece	m
Structure	Channel	1	369596 2048102	MQ-41/3 3m channel MQ-41/3 LL 3m channel	-	Min. S + 0.05
	Fixation material	2	369680	MQZ-L13 bored plate	4	-
		3	216467	M12 hegaxon nut	4	-
		4	339797	AM12x1000 4.8 threaded rod	-	2 x 1.0
		5	378544	HKD M12x50 drop-in anchor	2	-

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

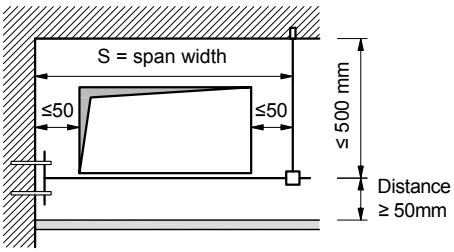
Fire Resistance Applications - Flexible Duct On Concrete

Bracket MM-B-36

Possible ultimate loads depending on the required fire resistance time 30 minutes and limited deformation of the channel ≤ 50 mm.



Equal load scheme



Flexible duct - Loading capacity limits	
Bracket:	MM-B-36
Fire resistance time:	30 minutes
Deformation of the channel:	≤ 50 mm

Bracket:	Span width (mm)	Equal load (∑ equally distributed load)
		Load (kN)
MM-B-36	400	0.5

Extract of test report IBMB no. 3074/068/12-CM , table 2-1to 2-2

Bill of material

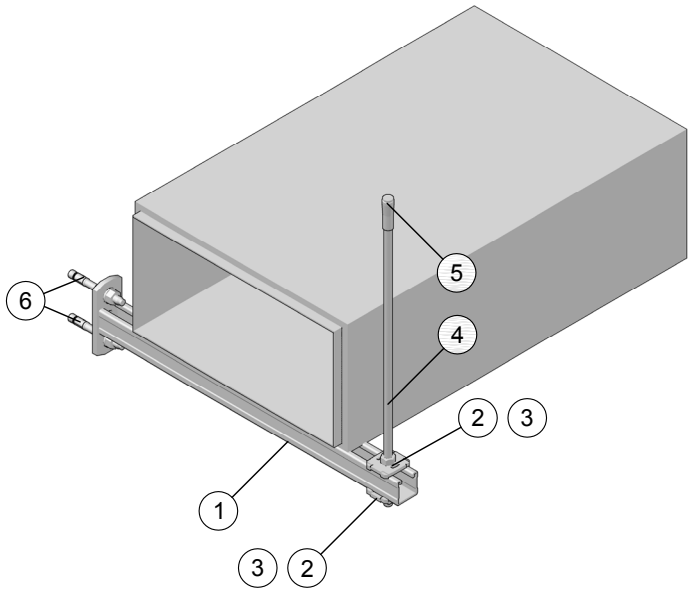
Part of typical		Ref.	Item no.	Description	Quantites for structure	
					Piece	m
Structure	Bracket	1	418755	MM-B-36/450 bracket	1	-
	Fixation material	2	418769	MM-CW M8 channel w asher	1	-
		3	282856	A 8.4/40 flat w asher	1	-
		4	216465	M8 hexagon nut	2	
		5	339793	AM8x1000 4.8 threaded rod	-	0.5
		6	376959	HKD M8x30 drop-in anchor	1	-
		7	2105712	HST3 M10x90 30/10 stud anchor	2	-

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

Fire Resistance Applications - Flexible Duct On Concrete

Bracket MQK-41 or MQK-41/3

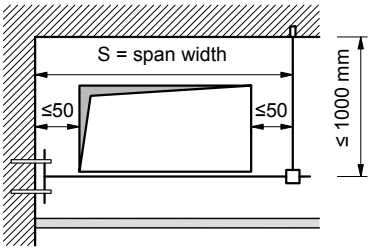
Possible ultimate loads depending on the required fire resistance time.



Flexible duct - Loading capacity limits		
Bracket:	MQK-41 and MQK-41/3	
Fire resistance time:	30, 60, 90 minutes	
Fire resistant time	Span width (mm)	Equal load (∑ equally distributed load)
		Load (kN)
		MQK-41 or MQK-41/3
30 minutes	350	3.40
	500	3.30
	600	3.15
60 minutes	350	2.10
	500	1.80
	600	1.70
90 minutes	350	2.10
	500	1.80
	600	1.70
120 minutes	350	1.50
	500	1.30
	600	1.15

Extract of test report IBMB no.3054/048/12-CM

Equal load scheme



Bill of material

Part of typical		Ref.	Item no.	Description	Quantites for structure	
					Piece	m
Structure	Bracket	1	369610	MQK-41/450 bracket	1	-
			369611	MQK-41/600 bracket		
			370596	MQK-41/3/450 bracket		
			370597	MQK-41/3/600 bracket		
	Fixation material	2	369680	MQZ-L13 bored plate	2	-
		3	216467	M12 hegaxon nut	2	
		4	339797	AM12x1000 4.8 threaded rod	-	1
		5	378544	HKD M12x50 drop-in anchor	1	-
		6	2105718	HST3 M12x105 30/10 stud anchor	2	-

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

Overview of fire-tested piperings

Hilti has tested various types of pipe ring over the last few years in accordance with the RAL quality guideline GZ-656 [6]. Furthermore, in the past other rings were fire-tested and evaluated by IBMB in Braunschweig. The corresponding RAL and IBMB test reports are summarized in annex 3.

Critical areas of suspended pipe rings when exposed to fire:

- Connection boss
  - Welded seam
  - Thread failure, internal thread on connection boss or threaded rod

- Closing mechanism
  - Joint
  - Screw
  - Quick-lock closure

Overview:

MPN-LI
RAL TD656.2011-17a.01

MPN-QRC
IBMB (3364/7036)-CM

MP-HI M8/M10
RAL TD656.2011-18a.01

MPN-RC
IBMB (3712/787/09)-CM

MP-MI/MIS
RAL TD656.2013-04a.01

MP-MX/MXI
IBMB (3365/7046)-CM

MP-SRNI
RAL TD656.2011-16a.01

MP-SRN
RAL TD656.2011-16a.02

MPN-MR
IBMB (3366/7056)-CM

MP-MRXI
IBMB (3366/7056)-CM

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

Pipering selection

Hilti fire-tested galvanized pipe rings

The following conditions must be clarified before a suitable pipe ring can be determined based upon the table:

1. The applicable pipe diameter.
2. Calculation of pipe weight per meter, taking the filling and possible insulation into account.
3. Definition of the available space between the pipe ring and relevant fire protection applications that are positioned below.
4. Clarification of the required fire resistance time.

The following table is used to clarify whether the pipe weight is lower than the maximum load capacity of the pipe ring with the specified spacing of the suspensions. Furthermore, it is possible to read whether the spacing is sufficient between the pipe ring and a classified building component or system that is installed below.

Selection table for galvanized pipe rings

Pipe Size	MPN-LI (M8) Clamping Range [mm]	MPN-LI (M8) Load / Deflection 30 min [N] / [mm]	MPN-LI (M8) Load / Deflection 90 min [N] / [mm]	MPN-QRC (M10) Clamping Range [mm]	MPN-QRC (M10) Load / Deflection 30 min [N] / [mm]	MPN-QRC (M10) Load / Deflection 90 min [N] / [mm]	MPN-RC (M8/M10) Clamping Range [mm]	MPN-RC (M8/M10) Load / Defl. 30 min [N] / [mm]	MP-HI (M8) Clamping Range [mm]	MP-HI (M8) Load / Deflection 30 min [N] / [mm]	MP-HI (M8) Load / Deflection 90 min [N] / [mm]	MP-MI / MIS (M10/M12/M16) Clamping Range [mm]	MP-MI / MIS (M10/M12/M16) Load / Deflection 30 min [N] / [mm]	MP-MI / MIS (M10/M12/M16) Load / Deflection 90 min [N] / [mm]	MP-MX / MP-MXI (M10/M12/M16) Clamping Range [mm]	MP-MX / MP-MXI (M10/M12/M16) Load / Deflection 30 min [N] / [mm]	MP-MX / MP-MXI (M10/M12/M16) Load / Deflection 90 min [N] / [mm]	Max. weight steel pipe, filled [N/m]
8/11	8 - 61	120 / 10 320 / 23	70 / 31	8 - 41	300 / 50	130 / 55	8 - 61 (20 x 1 mm)	100 / 50 130 / > 50	8 - 38	50 / 10 270 / 27	90 / 30								7
1"												14 - 64	230 / 20 840 / 39	350 / 54					41
2"				40 - 93	450 / 50	190 / 75			38 - 66	150 / 15 280 / 39	140 / 39				60 - 93	1050 / 50 1700 / 122	850 / 122		72
3"							40 - 93 (20 x 1.5 mm)	200 / 50 380 / > 50	66 - 110	280 / 30 580 / 46	230 / 46	68 - 90	270 / 25 850 / 45	430 / 59					135
4"				99 - 118	500 / 50 750 / 82	360 / 82						97 - 168	390 / 30 1320 / 66	730 / 75	108 - 166	1600 / 50 1700 / 148	850 / 148		209
5"							99 - 170 (20 x 2 mm)	400 / 50 590 / > 50	110 - 172	590 / 50 640 / 54	310 / 54								298
6"																			386
8"												177.8 - 244.5	770 / 50 1780 / 69	790 / 78	163 - 508	2300 / 50 3000 / 218	1600 / 218		947
368																			1600
457																			2600
508																			3200

Note: Use fire-tested Hilti anchors (annex 7)

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

Pipering selection

Hilti fire-tested stainless steel pipe rings

The following conditions must be clarified before a suitable pipe ring can be determined based upon the table:

1. The applicable pipe diameter.
2. Calculation of pipe weight per meter, taking the filling and possible insulation into account.
3. Definition of the available space between the pipe ring and relevant fire protection applications that are positioned below.
4. Clarification of the required fire resistance time.

The following table is used to clarify whether the pipe weight is lower than the maximum load capacity of the pipe ring with the specified spacing of the suspensions. Furthermore, it is possible to read whether the spacing is sufficient between the pipe ring and a classified building component or system that is installed below.

Selection table for stainless steel pipe rings

Pipe Size		Clamping Range	Load / Deflection			Clamping Range	Load / Deflection		Max. weight of water filled stainless steel pipes (DIN EN 10296 / DIN EN 10312)
			30 min	90 min			30 min	90 min	
		[mm]	[N] / [mm]	[N] / [mm]		[mm]	[N] / [mm]	[N] / [mm]	[N/m]
8/11	MP-SRNI (M8/M10)	17 - 34	310 / 10 1300 / 20	410 / 41	MP-SRN (M8/M10)	21 - 42	310 / 10 1300 / 20	410 / 41	2
1"									32
2"		42 - 60	1040 / 10 1600 / 12	700 / 17		42 - 60	1040 / 10 1600 / 12	700 / 17	59
3"	MP-MR (M12/M16)	68 - 219.1	1500 / 50 3600 / 128	1300 / 128					100
4"									166
5"									231
6"									338
8"									821
368	MRXI (M16)	244.5 - 508	1500 / 50 3600 / 128	1300 / 193					1377
457									2619
508									3224

Note: Use fire-tested Hilti anchors (annex 7)

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

Restriction of the threaded rod lenght for upright installation

To avoid sudden failure of the upright pipe rings due to lack of rigidity, it is recommended that the threaded rod lengths specified in the following tables are not exceeded.
Max. threaded rod length for upright installation of pipe rings .

Recommended maximum threaded rod length for upright installation of pipe rings :

Threaded rod M8 (4.8)

Vertical load [N]	30 min	60 min	90 min	120 min
	Length of rod [mm]			
100	80	80	80	80
150			40	40
200		40		
250				
300	40			
400				
450				
500				

Threaded rod M10 (4.8)

Vertical load [N]	30 min	60 min	90 min	120 min
	Length of rod [mm]			
100	140	140	140	140
150			80	80
200		80		
250			40	40
300	80			
400		40		
450				
500				
600	40			
700				
750				

Threaded rod M12 (4.8)

Vertical load [N]	30 min	60 min	90 min	120 min
	Length of rod [mm]			
100	160	160	160	160
150				120
200			120	80
250				
300		120	80	60
400			60	40
450		80		
500			40	
600	120			
700		60		
750				
800	80	40		
900				
1000				
1050	60			
1250				
1300	40			
1500				

Threaded rod M16 (4.8)

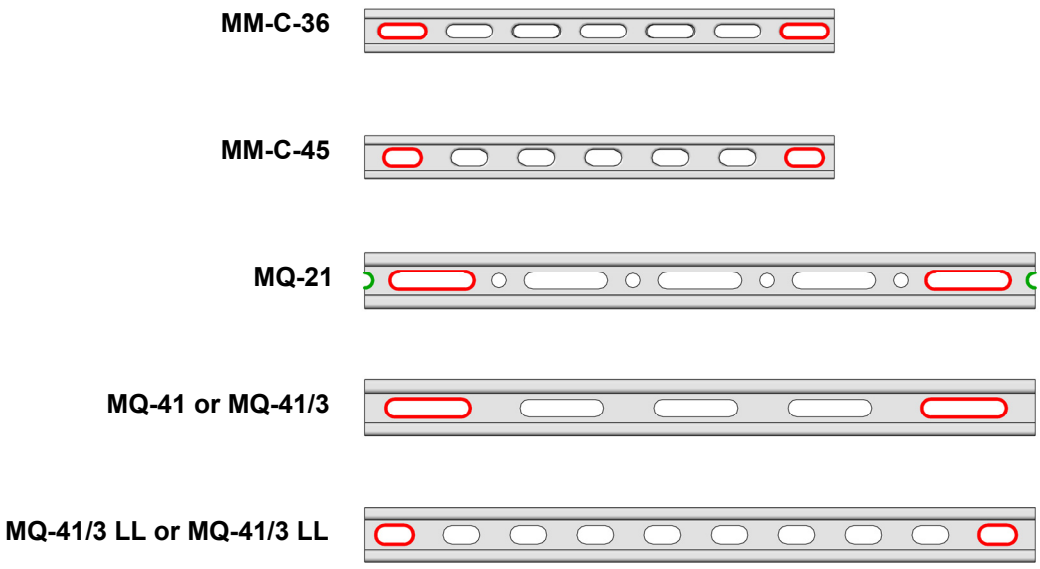
Vertical load [N]	30 min	60 min	90 min	120 min
	Length of rod [mm]			
400	160	160	160	160
450				140
500				
600				120
700			140	100
750			120	80
800		140		
900			100	60
1000		120	80	40
1050	140		60	
1100		100		
1200				
1250		80	40	
1300	120			
1350				
1400		60		
1500				
1600	100	40		
1700				
2000				
2100	80			
2250				
2300	60			
2500				
2600	40			
2900				

The restriction on use mentioned at the beginning of this manual applies to all the information and data described in this manual.

Cutting and distance of the cut from the oblong hole edge for head rail and trapeze on rods applications

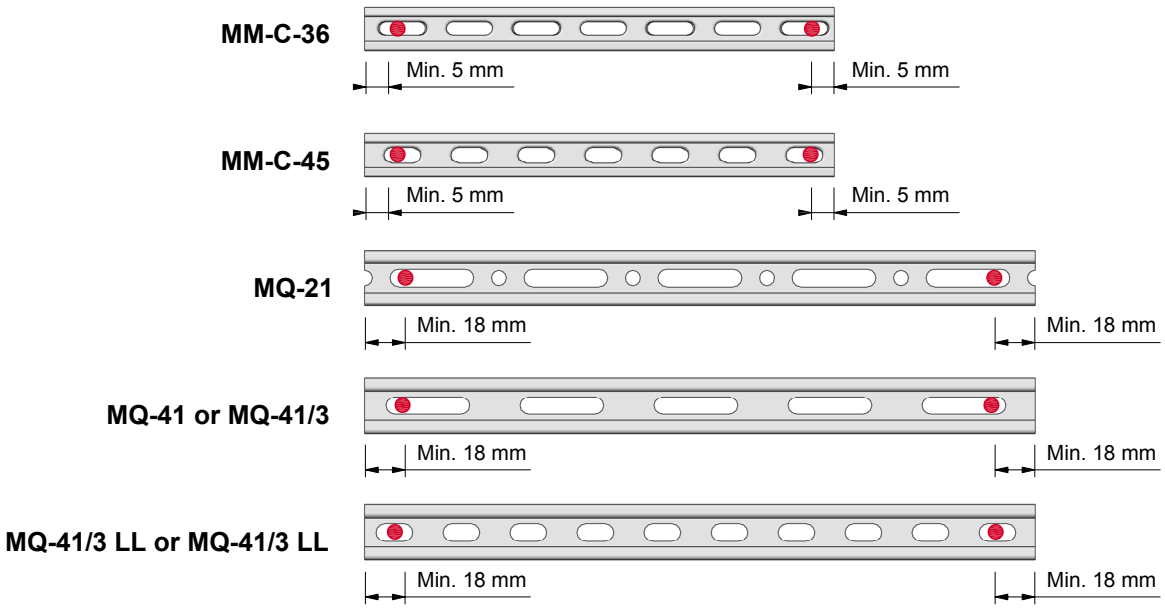
Cutting

To guarantee the loads recommended in this manual, there is an important cutting rule that has to be followed. The oblong holes must not be cut. It does not apply for round holes.



Distance of the cut from the oblong hole edge

There must be a minimum distance between the cut and oblong holes, see details below.



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Annexes

There is a list of used annexes:

Annex 1: Calculation of the deformation of installation channels exposed to fire – MFPA Leipzig GmbH

Annex 2: Fire protection design of installation systems – Process steps

Annex 3: IBMB and RAL test reports – Pipe rings

- Annex 3a: IBMB test report – MPN-QRC
- Annex 3b: IBMB test report – MPN-RC
- Annex 3c: IBMB test report – MP-MX/MXI
- Annex 3d: RAL test report – MPN-LI
- Annex 3e: RAL test report – MP-HI
- Annex 3f: RAL test report – MP-MI
- Annex 3g: RAL test report – MP-SRN
- Annex 3h: IBMB test report – MP-SRNI

Annex 4: IBMB test report – Roller connector

Annex 5: IBMB test reports – Installation channel systems

- Annex 5a: IBMB test report – MM installation channel system
- Annex 5b: IBMB test report – MQ-21 & MQ-41 installation channel system
- Annex 5b: IBMB test report – MQ-41/3 installation channel system
- Annex 5d: IBMB test report – U-support

Annex 6: Assessment - IBB, Germany Page

Anlage 7: Fire-tested Hilti anchors Page

- Annex 7: Fastening Technology Manual for Building Construction and Engineering Construction, issue 08/2015

All these annexes are available in german in the "**Installation Technical Manual - Technical Challenges - Fire Resistance**" and the english version are available on request. For support please contact your local Hilti expert.

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