

Fire test report

valid for

MPR-Support Channels

41/21/2,0; 41/21/2,5

41/41/2,0; 41/41/2,5

41/62/2,5

1-Field System, acc. EN 1363-1

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TEST REPORT SHORT FORM

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Validity: not limited

Subject matter: Extract from test report no. 210006985-1 dated 29.03.2016 of MPA NRW regarding the load-bearing capacity of MÜPRO MPR support channels 41/21/2.0 and 41/21/2.5 as 1-field system made of galvanized steel, loaded by centric tension when it is exposed to fire according to DIN EN 1363-1 in conjunction with threaded rods \geq M12. The load was attached to the MÜPRO MPR support channels with threaded rods \geq M8 and MPR-hammer head screws.

Fire testing: On 03.12.2015 MÜPRO MPR support channels have been exposed to fire according to DIN EN 1363-1 in the testing laboratory of MPA NRW. In addition, deformation measurements have been carried out on the MÜPRO MPR support channels during fire exposure.

Application: The required minimum distance a_{min} for installations in the cavity of suspended ceilings of fire safety relevant ceiling constructions between the top of the suspended ceiling and the bottom of the MÜPRO support channels can be defined by the determined deformations on the MÜPRO support channels according to the illustration in figure 1 and the details given in the tables in clause 2.

1 Fire resistance duration of MÜPRO MPR support channels 41/21/2.0, and 41/21/2.5

According to the test results specified in the test report no. 210006985-1 of 29.03.2016, fire resistance durations (load-bearing capacity of the support channels in time dependency) can be assigned to MÜPRO MPR support channels, which are produced in profile dimensions 41/21/2.0 and 41/21/2.5 (made of galvanized steel) and which are designed as 1-field system. The MÜPRO MPR support channels are fixed to the floor with threaded rods $\geq M12$ in strength category ≥ 4.6 , washers and nuts $\geq M12$ (each made of galvanized steel).

1.1 Table 1 / 1-field system (mounted directly) admissible load with centric single load

1-4	Fire resistance duration [min.]			
Designation	30 max. F [kN]	60 max. F [kN]	90 max. F [kN]	120 max. F [kN]
MÜPRO MPR-support channel 41/21/2.0 fixed with threaded rods $\geq M12$ MPR-fixing clips (M12) heavy type, 2x hexagon nut DIN 934, load fixed with threaded rods $\geq M8$ and MPR-hammer head screws M8 x 40 mm static span ≤ 480 mm	≤ 1.190	≤ 0.680		≤ 0.340

1.2 Table 2 / 1-field system (mounted directly) admissible load with centric single load

5-6	Fire resistance duration [min.]			
Designation	30 max. F [kN]	60 max. F [kN]	90 max. F [kN]	120 max. F [kN]
MÜPRO MPR-support channels 41/21/2.0 fixed with threaded rods ≥ M 12 MPR-fixing clips (M12) heavy type, 2x hexagon nut DIN 934, load fixed with threaded rods ≥ M 10 and MPR-hammer head screws M10 x 55 mm static span ≤ 480 mm	≤ 1.360	≤ 0.850	≤ 0.430	

1.3 Table 3 / 1-field system (mounted directly) admissible load with uniformly distributed load

17-20	Fire resistance duration [min.]			
Designation	30 max. F [kN]	60 max. F [kN]	90 max. F [kN]	120 max. F [kN]
MÜPRO MPR-support channel 41/21/2.0 fixed with threaded rods ≥ M 12 MPR-fixing clips (M12)) heavy type, 2x hexagon nut DIN 934, load fixed with threaded rods ≥ M 8 and MPR-hammer head screws M8 x 40 mm load distance = 195 mm static span ≤ 480 mm	≤ 1.790		≤ 0.510	

1.4 Table 4 / 1-field system (mounted directly) admissible load with uniformly distributed load

21-24	Fire resistance duration [min.]			
Designation	30 max. F [kN]	60 max. F [kN]	90 max. F [kN]	120 max. F [kN]
MÜPRO MPR-support channel 41/21/2,0 fixed with threaded rods ≥ M 12 MPR-fixing clips (M12) heavy type, 2x hexagon nut DIN 934, load fixed with threaded rods ≥ M 10 and MPR-hammer head screws M10 x 55 mm load distance = 195 mm static span ≤ 480 mm	≤ 2.040			

1.5 Table 5 / 1-field system (mounted directly) admissible load with centric single load

G1-G4	Fire resistance duration [min.]			
Designation	30 max. F [kN]	60 max. F [kN]	90 max. F [kN]	120 max. F [kN]
MÜPRO MPR-support channel 41/21/2,0 fixed with threaded rods ≥ M 12 MPR-fixing clips (M12) heavy type, 2x hexagon nut DIN 934, load fixed with threaded rods ≥ M 8 MPR-threaded plate M8 and MPR-fixing clip M8 heavy static span ≤ 480 mm	≤ 1.190	≤ 0.680		≤ 0.340

1.6 Table 6 / 1-field system (mounted directly) admissible load with centric single load

9-12	Fire resistance duration [min.]			
Designation	30 max. F [kN]	60 max. F [kN]	90 max. F [kN]	120 max. F [kN]
MÜPRO MPR-support channel 41/21/2,5 fixed with threaded rods ≥ M 12 MPR-fixing clips (M12) heavy type, 2x hexagon nut DIN 934, load fixed with threaded rods ≥ M 10 and MPR-hammer head screws M10 x 55 mm static span ≤ 480 mm	≤ 0.940			

1.7 Table 7 / 1-field system (suspended) admissible load with centric single load

13-16	Fire resistance duration [min.]			
Designation	30 max. F [kN]	60 max. F [kN]	90 max. F [kN]	120 max. F [kN]
MÜPRO MPR-support channel 41/21/2,5 fixed with threaded rods ≥ M 12 MPR-fixing clips (M12) heavy type, 2x hexagon nut DIN 934, load fixed with threaded rods ≥ M 10 and MPR-hammer head screws M12 x 55 mm static span ≤ 480 mm	≤ 0.940			

1.8 Table 8 / 1-field system (mounted directly) admissible load with uniformly distributed load

25-28	Fire resistance duration [min.]			
Designation	30 max. F [kN]	60 max. F [kN]	90 max. F [kN]	120 max. F [kN]
MÜPRO MPR-support channel 41/21/2,5 fixed with threaded rods ≥ M 12 MPR-fixing clips (M12) heavy type, 2x hexagon nut DIN 934, load fixed with MPR-hammer head screws M10 x 55 mm load distance = 195 mm static span ≤ 480 mm	≤ 2.300		≤ 1.400	≤ 0.890

1.9 Table 9 / 1-field system (mounted directly) admissible load with uniformly distributed load

29-32	Fire resistance duration [min.]			
Designation	30 max. F [kN]	60 max. F [kN]	90 max. F [kN]	120 max. F [kN]
MÜPRO MPR-support channel 41/21/2,5 fixed with threaded rods ≥ M 12 MPR-fixing clips (M12) heavy type, 2x hexagon nut DIN 934, load fixed with MPR-hammer head screws M12 x 55 mm load distance = 195 mm static load ≤ 480 mm	≤ 2.420	≤ 1.400		≤ 0.890

1.10 Table 10 / 1-field system (mounted directly) admissible load with centric single load

G5-G8	Fire resistance duration [min.]			
Designation	30 max. F [kN]	60 max. F [kN]	90 max. F [kN]	120 max. F [kN]
MÜPRO MPR-support channel 41/21/2,0 fixed with threaded rods ≥ M 12 MPR-fixing clips (M12) heavy type, 2x hexagon nut DIN 934, Load fixed with MPR-fixing clips M10 heavy static span ≤ 480 mm	≤ 1.360	≤ 0.850	≤ 0.600	≤ 0.430

1.11 Table 11 / 1-field system (mounted directly) admissible load with uniformly distributed load

G17-G20	Fire resistance duration [min.]			
Designation	30 max. F [kN]	60 max. F [kN]	90 max. F [kN]	120 max. F [kN]
MÜPRO MPR-support channel 41/21/2,0 fixed with threaded rods ≥ M 12 MPR-fixing clips (M12) heavy type, 2x hexagon nut DIN 934, load fixed with MPR-fixing clips M8 heavy load distance = 195 mm static span ≤ 480 mm	≤ 1.790			

1.12 Table 12 / 1-field system (mounted directly) admissible load with uniformly distributed load

G21-G24	Fire resistance duration [min.]			
Designation	30 max. F [kN]	60 max. F [kN]	90 max. F [kN]	120 max. F [kN]
MÜPRO MPR-support channel 41/21/2,0 fixed with threaded rods ≥ M 12 MPR-fixing clips (M12) heavy type, 2x hexagon nut DIN 934, load fixed with MPR-fixing clips M10 heavy load distance = 195 mm static span ≤ 480 mm	≤ 2.040		≤ 0.890	

1.13 Table 13 / 1-field system (mounted directly) admissible load with centric single load

G9-G12	Fire resistance duration [min.]			
Designation	30 max. F [kN]	60 max. F [kN]	90 max. F [kN]	120 max. F [kN]
MÜPRO MPR-support channel 41/21/2,5 fixed with threaded rods ≥ M 12 MPR-fixing clips (M12) heavy type, 2x hexagon nut DIN 934, load fixed with MPR-fixing clips M10 heavy static span ≤ 480 mm	≤ 1.530	≤ 0.600		≤ 0.430

1.14 Table 14 / 1-field system (mounted directly) admissible load with centric single load

G13-G16	Fire resistance duration [min.]			
Designation	30 max. F [kN]	60 max. F [kN]	90 max. F [kN]	120 max. F [kN]
MÜPRO MPR-support channel 41/21/2,5 fixed with threaded rods ≥ M 12 MPR-fixing clips (M12) heavy type, 2x hexagon nut DIN 934, load fixed with MPR-fixing clips M12 heavy static span ≤ 480 mm	≤ 0.940		≤ 0.430	

1.15 Table 15 / 1-field system (mounted directly) admissible load with uniformly distributed load

G25-G28	Fire resistance duration [min.]			
Designation	30 max. F [kN]	60 max. F [kN]	90 max. F [kN]	120 max. F [kN]
MÜPRO MPR-support channel 41/21/2,5 fixed with threaded rods ≥ M 12 MPR-fixing clips (M12) heavy type, 2x hexagon nut DIN 934, load fixed with MPR-fixing clips M10 heavy load distance = 195 mm static span ≤ 480 mm	≤ 2.300			

1.16 Table 16 / 1-field system (mounted directly) admissible load with uniformly distributed load

G29-G32	Fire resistance duration [min.]			
Designation	30 max. F [kN]	60 max. F [kN]	90 max. F [kN]	120 max. F [kN]
MÜPRO MPR-support channel 41/21/2.5 fixed with threaded rods ≥ M 12 MPR-fixing clips (M12) heavy type, 2x hexagon nut DIN 934, load fixed with MPR-fixing clips M12 heavy load distance = 195 mm static span ≤ 480 mm	≤ 2.420		≤ 1.420	≤ 0.890

2 Minimum distances a_{\min} for MÜPRO MPR support channels 41/21/2.0, and 41/21/2.5 considering clause 1

For the direct mounting of MÜPRO MPR support channels which are to be mounted in the cavity of suspended ceilings of fire safety relevant ceiling constructions, a sufficient minimum distance a_{\min} is specified between the top of the ceiling and the bottom edge of the MÜPRO MPR support channels according to figure 1 and the specifications given in the tables in clause 2 according to the test results obtained in the fire tests.

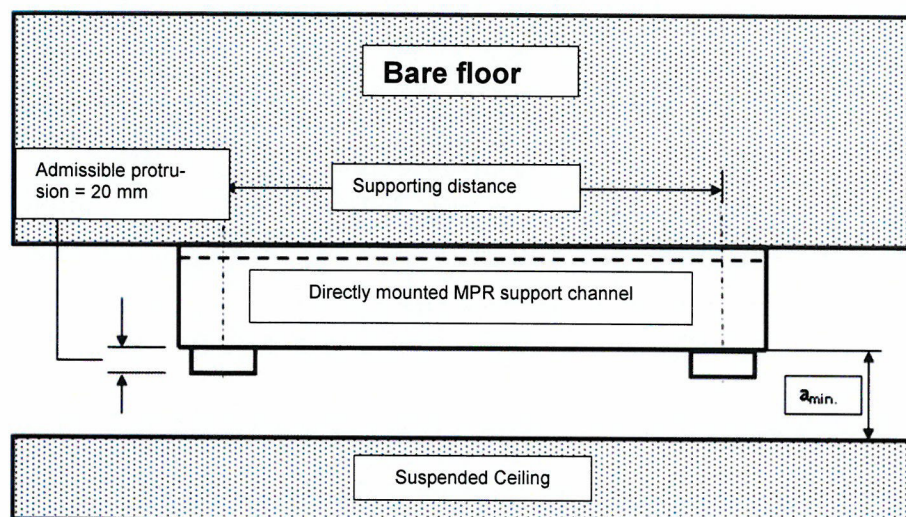
When the minimum distances a_{\min} are kept, the ceiling is not influenced by temperature-caused change in length of the MÜPRO MPR support channels in case of fire exposure.

The minimum distances a_{\min} for the fire resistance durations are specified in clause 2 of the tables. When the minimum distances were specified, the overlap of the threaded rods of $u_1=20$ mm on the bottom of the support channels was taken into account. In case of greater protrusion of the threaded rods the amount from u_2 minus u_1 (u_2 = protrusion ≥ 20 mm) has to be added to the minimum distances.

2.1 Figure 1

For the cavity of suspended ceilings of fire safety relevant ceiling constructions, minimum distances a_{\min} which must be taken into account correspondingly depending on the static span and the threaded rod protrusion u_2 below the support channels are shown in figure 1.

The minimum distances a_{\min} in dependence of the fire resistance durations shown in the following tables are valid for MÜPRO MPR support channels 41/21/2.0 and 41/21/2.5 in connection with washers and nuts $n_g \geq M8$ according to the test setup during the fire tests.



2.2 Table 17 / 1-field system (mounted directly)

Minimum distances a_{min}

Müpro MPR support channel 41/21/2.0, single load 1-4

support channel	Müpro MPR support channel 41/21/2.0	
Fixing device	Threaded rod M 12	
System	1-field system	
Load mounting	M 8	
Load distance	Not applicable	
Static span	$l \leq 480 \text{ mm}$	
Suspension height	$h = 0 \text{ mm}$	
a_{min} for fire resistance durations of 30 min. F_{max}	$f \leq \text{mm}$ kN	141 1.19
a_{min} for fire resistance durations of 30 min. to 90 min. F_{max}	$f \leq \text{mm}$ kN	255 0.68
a_{min} for fire resistance durations of 30 min. to 120 min. F_{max}	$f \leq \text{mm}$ kN	130 0.34

2.3 Table 18 / 1-field system (mounted directly)

Minimum distances a_{\min}

Müpro MPR support channel 41/21/2.0, single load 5-8

support channel	Müpro MPR support channel 41/21/2.0	
Fixing device	Threaded rod M 12	
System	1-field system	
Load mounting	M 10	
Load distance	Not applicable	
Static span	$l \leq 480 \text{ mm}$	
Suspension height	$h = 0 \text{ mm}$	
a_{\min} for fire resistance durations of 30 min. F_{\max}	$f \leq \text{mm}$ kN	90 1.36
a_{\min} for fire resistance durations of 30 min. to 90 min. F_{\max}	$f \leq \text{mm}$ kN	121 0.85
a_{\min} for fire resistance durations of 30 min. to 120 min. F_{\max}	$f \leq \text{mm}$ kN	130 0.43

2.4 Table 19 / 1-field system (mounted directly)

Minimum distances a_{\min}

Müpro MPR support channel 41/21/2.0,
uniformly distributed load 17-20

support channel	Müpro MPR support channel 41/21/2.0	
Fixing device	Threaded rod M 12	
System	1-field system	
Load mounting	M 8	
Load distance	$e = 195 \text{ mm}$	
Static span	$l \leq 480 \text{ mm}$	
Suspension height	$h = 0 \text{ mm}$	
a_{\min} for fire resistance durations of 30 min. F_{\max}	$f \leq \text{mm}$ kN	91 1.79
a_{\min} for fire resistance durations of 30 min. to 90 min. F_{\max}	$f \leq \text{mm}$ kN	172 1.79
a_{\min} for fire resistance durations of 30 min. to 120 min. F_{\max}	$f \leq \text{mm}$ kN	180 1.02

2.5 Table 20 / 1-field system (mounted directly)

Minimum distances a_{min}

Müpro MPR support channel 41/21/2.0,
uniformly distributed load 21-24

support channel	Müpro MPR support channel 41/21/2.0	
Fixing device	Threaded rod M 12	
System	1-field system	
Load mounting	M 10	
Load distance	$e = 195 \text{ mm}$	
Static span	$l \leq 480 \text{ mm}$	
Suspension height	$h = 0 \text{ mm}$	
a_{min} for fire resistance durations of 30 min. F_{max}	$f \leq \text{mm}$ kN	103 2,04
a_{min} for fire resistance durations of 30 min. to 60 min. F_{max}	$f \leq \text{mm}$ kN	149 2,04
a_{min} for fire resistance durations of 30 min. to 90 min. F_{max}	$f \leq \text{mm}$ kN	160 2,04
a_{min} for fire resistance durations of 30 min. to 120 min. F_{max}	$f \leq \text{mm}$ kN	160 2,04

2.6 Table 21 / 1-field system (mounted directly)

Minimum distances a_{min}

Müpro MPR support channel 41/21/2.5, single load 9-12

support channel	Müpro MPR support channel 41/21/2.5	
Fixing device	Threaded rod M 12	
System	1-field system	
Load mounting	M 10	
Load distance	Not applicable	
Static span	$l \leq 480 \text{ mm}$	
Suspension height	$h = 0 \text{ mm}$	
a_{min} for fire resistance durations of 30 min. F_{max}	$f \leq \text{mm}$ kN	76 0.94
a_{min} for fire resistance durations of 30 min. to 60 min. F_{max}	$f \leq \text{mm}$ kN	120 0.94
a_{min} for fire resistance durations of 30 min. to 90 min. F_{max}	$f \leq \text{mm}$ kN	140 0.94
a_{min} for fire resistance durations of 30 min. to 90 min. F_{max}	$f \leq \text{mm}$ kN	153 0.94

2.7 Table 22 / 1-field system (mounted directly)

Minimum distances a_{\min}

Müpro MPR support channel 41/21/2.5, single load 13-16

support channel	Müpro MPR support channel 41/21/2.5	
Fixing device	Threaded rod M 12	
System	1-field system	
Load mounting	M 12	
Load distance	Not applicable	
Static span	$l \leq 480 \text{ mm}$	
Suspension height	$h = 0 \text{ mm}$	
a_{\min} for fire resistance durations of 30 min. F_{\max}	$f \leq \text{mm}$ kN	125 1.62
a_{\min} for fire resistance durations of 30 min. to 120 min. F_{\max}	$f \leq \text{mm}$ kN	304 1.62

2.8 Table 23 / 1-field system (mounted directly)

Minimum distances a_{\min}

Müpro MPR support channel 41/21/2.5,
uniformly distributed load 25-28

support channel	Müpro MPR support channel 41/21/2.5	
Fixing device	Threaded rod M 12	
System	1-field system	
Load mounting	M 10	
Load distance	$e = 195 \text{ mm}$	
Static span	$l \leq 480 \text{ mm}$	
Suspension height	$h = 0 \text{ mm}$	
a_{\min} for fire resistance durations of 30 min. F_{\max}	$f \leq \text{mm}$ kN	144 2.30
a_{\min} for fire resistance durations of 30 min. to 60 min. F_{\max}	$f \leq \text{mm}$ kN	180 2.30
a_{\min} for fire resistance durations of 30 min. to 90 min. F_{\max}	$f \leq \text{mm}$ kN	156 1.40
a_{\min} for fire resistance durations of 30 min. to 120 min. F_{\max}	$f \leq \text{mm}$ kN	130 0.89

2.9 Table 24 / 1-field system (mounted directly)

Minimum distances a_{\min}

**Müpro MPR support channel 41/21/2.5,
 uniformly distributed load 28-32**

support channel	Müpro MPR support channel 41/21/2.5	
Fixing device	Threaded rod M 12	
System	1-field system	
Load mounting	M 12	
Load distance	$e = 195 \text{ mm}$	
Static span	$l \leq 480 \text{ mm}$	
Suspension height	$h = 0 \text{ mm}$	
a_{\min} for fire resistance durations of 30 min. F_{\max}	$f \leq \text{mm}$ kN	168 2.42
a_{\min} for fire resistance durations of 30 min. to 90 min. F_{\max}	$f \leq \text{mm}$ kN	166 1.40
a_{\min} for fire resistance durations of 30 min. to 120 min. F_{\max}	$f \leq \text{mm}$ kN	122 0.89

3 Special information

3.1 Support channels

Fire resistance durations according to the specifications given in clause 1 have been verified for MÜPRO MPR support channels with profile dimensions 41/21/2.0 and 41/21/2.5. The assessment for the MÜPRO MPR support channels are only valid in connection with building elements, which have at least the same fire resistance duration as the MÜPRO MPR support channels.

3.2 Application in the intermediate ceiling area

When using MÜPRO MPR support channels together with threaded rods $\geq M12$ according to clause 1 in the intermediate ceiling area of suspended ceiling constructions with fire resistance classification a minimum distance a_{\min} is determined between the top of the ceiling and the bottom side of MÜPRO MPR support channels according to figure 1 and the details given in the tables in clause 2 and 3.

By observing the minimum distances a_{\min} , the ceiling construction is not affected in case of fire exposure due to the temperature-related, vertical deformations.

When attaching MÜPRO pipe clamps or other construction elements, which have been tested by fire (loaded) according to DIN 4102-2; 1977-09 or DIN EN 1363-1, respectively, to the undersides of the afore mentioned MÜPRO support channels, the minimum distance a_{\min} is determined by the total of the individual deformations, which result from the deformations of the MÜPRO MPR support channels, the MÜPRO pipe clamps and other construction elements.

3.3 Cable systems

The suitability of MÜPRO MPR support channels for cable systems for which a functional integrity according to DIN 4102-12:1998-11 is required, has to be verified by fire tests.

3.4 Application, non-combustible pipes

For the MÜPRO MPR support channels fire resistance durations have been verified according to the performed fire test.

With regard to fire protection, there are no concerns against using MÜPRO pipe clamps for fixing of non-combustible pipes to the top side of the support channels.

The specifications given in clause 3.2 have to be taken into account when mounting the MÜPRO pipe clamps to the bottom sides of the MÜPRO MPR support channels.

3.5 Application, combustible pipes

When combustible pipes with an outer diameter of ≤ 160 mm are fixed by MÜPRO pipe clamps on the top side of fire protection support channels, the fire resistance durations of MÜPRO MPR support channels according to clause 1 are only given, when the pipes are additionally protected with pipe sheathings along the entire length in the corresponding fire resistance classification on basis of „Allgemeiner Bauaufsichtlicher Prüfzeugnisse“.

The specifications given in clause 3.2 have to be taken into account when mounting the MÜPRO pipe clamps to the bottom sides of the MÜPRO MPR support channels.

3.6 Material of MÜPRO MPR support channels

With regard to fire protection, there are no concerns against the use of MÜPRO MPR support channels when they are made of stainless steel in quality A2 or A4.

3.7 Cross-sectional dimensions

The assessments given in this test report are valid for MÜPRO MPR support channels of sizes 41/21/2.0 und 41/21/2.5 as well as higher profiles, e.g.:

41/41/2.0

41/41/2.5

41/62/2.5.

The specified assessments for MÜPRO MPR support channels with wall thicknesses $d = 2$ mm are also valid for MÜPRO MPR support channels with wall thicknesses $d > 2$ mm.


3.8 Validity

The validity of this test report is not limited.

This English version of the test report is issued additionally to the test report written in German language with the same report number. In case of doubt the German version is solely valid.

Erwitte, 30.08.2016

On behalf


Dipl.-Ing. H. Kötter
Person in charge



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