

FUNCTION IN FIRE EXPERT JUDGEMENT REPORT WITH CLASSIFICATION FIRES-JR-059-21-NURE

Simple and double clips, type X-FB and X-DFB with nails X-EGN, X-GHP and X-GN together with power and communication cables

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FUNCTION IN FIRE EXPERT JUDGEMENT REPORT WITH CLASSIFICATION IN ACCORDANCE WITH DIN 4102-12: 1998-11

FIRES-JR-059-21-NURE

Name of the product: Simple and double clips, type X-FB and X-DFB
with nails X-EGN, X-GHP and X-GN
together with power and communication cables

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1. INTRODUCTION

This expert judgement report with classification defines the function in fire classification assigned to element „Simple and double clips, type X-FB and X-DFB with nails X-EGN, X-GHP and X-GN together with power and communication cables” with circuit integrity maintenance in fire in accordance with the classes given in DIN 4102 – 12: 1998-11.

The test was carried out according to standard STN 92 0205 and meets requirements of DIN 4102-12: 1998-11. Basic deviation in process and carrying out of test between these standards is in measuring and in control of temperature in the test furnace. According to STN 92 0205, plate thermometers according to EN 1363-1 are used. According to DIN 4102-12: 1998-11, common thermocouples of construction which was used for this measurement till issue of EN 1363-1 are used. Measurement by plate thermometers acc. to EN 1363-1 can be considered as stricter method of temperature control in test furnace in compare with thermocouples used till issue of EN 1363-1. Therefore, it is possible to use results of test according to STN 92 0205 for classification of tested cables according to DIN 4102-12: 1998-11, but not conversely. Identified deviation results in stricter course of test and it can lead to reduced classification of tested cables what is accepted as enhanced security in practice.

This expert judgement report defines field of application that is wider than field according test standard. This expert judgement expresses the opinion of the FIRES and is based on the experience or internal rules of FIRES.

This products have already been classified by FIRES, s.r.o. and number of previous Function in fire expert judgement report with classification is FIRES-JR-096-16-NURE Edition 3 (issued on 29. 01. 2019) with validity until 20. 07. 2021. Document FIRES-JR-059-21-NURE replaces expert judgement reports with classification FIRES-JR-096-16-NURE Edition 3.

This document also supplements the customer's request to add the possibility of using new self-tapping screws for sheet metal, type S-MS 01 Z 4.8x20.

2. DETAILS OF CLASSIFIED PRODUCT

2.1 GENERAL

The element, simple and double clips, type X-FB and X-DFB with nails X-EGN, X-GHP and X-GN together with power and communication halogen free cables is defined as a cable bearing system for power and communication halogen free cables with circuit integrity maintenance in fire.

2.2 PRODUCT DESCRIPTION

Product are simple and double clips, type X-FB and X-DFB with nails X-EGN, X-GHP and X-GN together with power and communication halogen free cables with circuit integrity maintenance in fire.

Simple and double clips X-FB and X-DFB

Simple and double clips, type X-FB and X-DFB are made of zinc-coated steel sheet 1 mm thick, $f_u = 270 - 420 \text{ N/mm}^2$, thickness of zinc coat $\geq 5 \text{ }\mu\text{m}$. Clips are designed to simply, fast and safe fixing electrical cables and electric distribution systems to ceiling or to wall of building and steel profiles.

Nails

Nail X - EGN 14 is designed to steel and very hard concrete. It is made of steel HRC 58, thickness of zinc coat 2 – 8 μm , diameter of head nail 6,8 mm and diameter of nail 3 mm.

Nails X – GHP 18 and 20 are designed to steel and hard concrete. They are made of steel HRC 58, thickness of zinc coat 2 – 8 μm , diameter of head nail 6,8 mm and diameter of nail 3 mm.

Nail X – GN 20 is designed to concrete. It is made of steel HRC 53,5, thickness of zinc coat 2 – 8 μm , diameter of head nail 6,8 mm and diameter of nail 3 mm.

Nail X – GN 27 are designed to concrete, aerated concrete and brick. It is made of steel HRC 53,5, thickness of zinc coat 2 – 8 μm , diameter of head nail 6,8 mm and diameter of nail 3 mm.

Nails X – GN 32 and 39 are designed to aerated concrete and brick. It is made of steel HRC 53,5, thickness of zinc coat 2 – 8 μm , diameter of head nail 6,8 mm and diameter of nail 3 mm.

**Power and communications cables**

Power and communication free halogen cables are intended for the stationary distribution of electrical energy in dry or damp premises and for fixed installations in air or concrete. Suitable for hotels, hospitals, underground railways, airports etc. to protect people and technical building equipment in the event of fire if circuit integrity is required (circuit integrity is only maintained if these cables are installed with specified supporting elements). Not allowed for installations underground or in water.

Used cables by test:

PRAKAB PRAŽSKÁ KABELOVNA, s.r.o.:

Power cables:

- type PRAFlaDur[®] 90 (N)HXH-J 4x1,5 RE FE180/P90-R... (6x – acc. TP PRAKAB 04/08)
- type PRAFlaDur[®] 90 (N)HXH-J 5x10 RE FE180/P90-R... (6x – acc. TP PRAKAB 04/08)
- type PRAFlaDur[®] 90 (N)HXH-J 4x35 RE FE180/P90-R... (2x – acc. TP PRAKAB 04/08)
- type PRAFlaDur[®] 90 (N)HXH-J 4x50 RE FE180/P90-R... (4x – acc. TP PRAKAB 04/08)

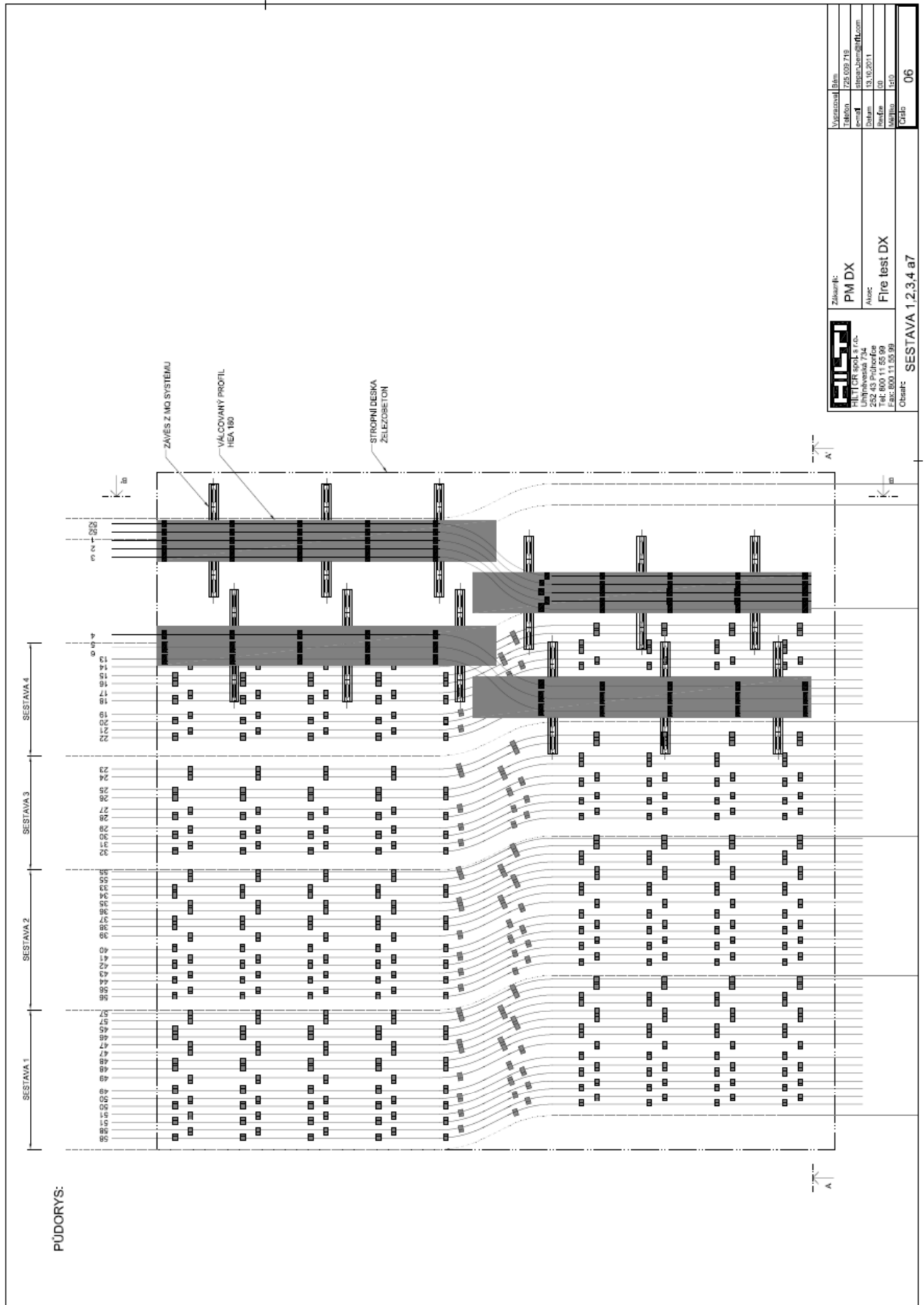
- Communication cables:
- type PRAFlaGuard[®] F SSKFH-V180 1x2x0,8 P90-R... (6x – acc. TP PRAKAB 05/01 – 5. ed.)

The length of cables was 4,5 m, 3,1 m from that was exposed to fire.

More detailed information about the product is provided by the description of the tested product and the drawing documentation, which is part of the test reports [1-2], which uses this expert judgement report. Drawings were delivered by sponsor.



Assembly of the tested structure, more information in the test report [1].





3. TEST REPORTS AND EXTENDED APPLICATION REPORTS IN SUPPORT OF CLASSIFICATION

3.1 TEST REPORTS AND EXTENDED APPLICATION REPORTS

No.	Name of laboratory	Name of sponsors	Test report No.	Date of the test	Test method
[1]	Fires s.r.o., Batizovce Slovak Republic	Hilti ČR spol. s r.o., Průhonice, Praha – západ, Czech Republic	FIRES-FR- 178-11-AUNS	25.08.2011	STN 92 0205
[2]	EMI Budapest, Hungary	Hilti (Hungária) Szolgáltató, Budapest, Hungary	M-767/2010	05.11.2010	EN 1363-1: 2000

3.2 TEST RESULTS

Test report No. /Test method	Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
[1] STN 92 0205	1	PRAFlaDur® 90 (N)HXH-J 4x1,5 RE FE180/P90-R...	7	120 minutes no failure / interruption
	2	PRAFlaDur® 90 (N)HXH-J 4x1,5 RE FE180/P90-R...	7	120 minutes no failure / interruption
	3	PRAFlaDur® 90 (N)HXH-J 5x10 RE FE180/P90-R...	7	77 minutes
	4	PRAFlaDur® 90 (N)HXH-J 5x10 RE FE180/P90-R...	7	11 minutes
	5	PRAFlaDur® 90 (N)HXH-J 4x50 RE FE180/P90-R...	7	55 minutes
	6	PRAFlaDur® 90 (N)HXH-J 4x50 RE FE180/P90-R...	7	94 minutes
	45	PRAFlaDur® 90 (N)HXH-J 4x1,5 RE FE180/P90-R...	1	120 minutes no failure / interruption
	46	PRAFlaDur® 90 (N)HXH-J 4x1,5 RE FE180/P90-R...	1	120 minutes no failure / interruption
	47	2 káble PRAFlaDur® 90 (N)HXH-J 5x10 RE FE180/P90-R...	1	120 minutes no failure / interruption
	48	2 káble PRAFlaDur® 90 (N)HXH-J 4x35 RE FE180/P90-R...	1	120 minutes no failure / interruption
	49	2 káble PRAFlaDur® 90 (N)HXH-J 4x50 RE FE180/P90-R...	1	120 minutes no failure / interruption
	50	2 káble PRAFlaDur® 90 (N)HXH-J 5x10 RE FE180/P90-R...	1	120 minutes no failure / interruption
	51	2 káble PRAFlaDur® 90 (N)HXH-J 4x1,5 RE FE180/P90-R...	1	120 minutes no failure / interruption
	52A	PRAFlaGuard® F SSKFH-V180 1x2x0,8 P90-R...	7	100 minutes
	52B	PRAFlaGuard® F SSKFH-V180 1x2x0,8 P90-R...	7	98 minutes
	57A	PRAFlaGuard® F SSKFH-V180 1x2x0,8 P90-R...	1	120 minutes no failure / interruption
	57B	PRAFlaGuard® F SSKFH-V180 1x2x0,8 P90-R...	1	120 minutes no failure / interruption
	58A	PRAFlaGuard® F SSKFH-V180 1x2x0,8 P90-R...	1	99 minutes
58B	PRAFlaGuard® F SSKFH-V180 1x2x0,8 P90-R...	1	120 minutes no failure / interruption	

[1] The fire test was discontinued in the 122nd minute at the request of test sponsor.

The result of specimen S4 can be considered as random regarding to results of the same cables in other cable systems and therefore can be omitted from the classification.

Specimens S1 – S51 were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W. Specimens S52 – S58 were tested by one-phase voltage supply 1 x 110V with LED diodes 3V /0,03W. Circuit breakers with rating 3 A and operating characteristic B(gL) were used.



4. CHANGES OF PRODUCT OR PRODUCT FINAL USAGE WHICH EXCEED A RANGE OF DIRECT OR EXTENDED APPLICATION

In previous expert judgement reports FIRES-JR-094-16-NURS Edition 1 to Edition 3, the installation of single and double clamps X-FB and X-DFB was allowed by means of fastening nails and the change of the thickness of the zinc layer on the clamps was allowed:

- 1) Nails X-S 14 B3 and X-S 14 G3 MX are designed to steel and very hard concrete. Nails are made of steel HRC 57,5, thickness of zinc coat 2 – 8 μm , diameter of head nail 6,8 mm and diameter of nail 3 mm.
- 2) Klince X-P 17/20/24 B3 MX, X-P 17/20/24 G3 MX a X-P 30/36 B3 P7 are designed to concrete, aerated concrete and brick. Nails are made of steel HRC 57,5, thickness of zinc coat 2 – 8 μm , diameter of head nail 6,8 mm and diameter of nail 3 mm.
- 3) Previous thickness of Zinc layer 10-20 μm can be decreased to new value $\geq 5\mu\text{m}$.

In addition to the extended application, in this judgement report, application of test results stated in chap 6.1 is allowed also for:

- 4) assembly of simple X-FB clamps by means of self-tapping screws S-MS 01 Z 4.8x20. The screws are designed for steel sheet of at least thickness of 2 mm. The screws have a diameter of 4.8 mm and a length of 20 mm. The maximum load of the clamps fastened with S-MS 01 Z screws can be 2 kg;
- 5) use of single core cables.

5. REASONS SUPPORTING THE PERMIT OF CHANGES

Product changes referred to in cl. 4. of this document are permitted for the following reasons:

- 1) - 2) the design of the new fastening nails is the same as the tested nails, the change is in the design of the plastic nail stack, which makes it possible to use a different nail gun. This change will not influence the functional resistance to fire of the product, as mentioned to in clause 6.1 of this document;
- 3) the reduction of the thickness of the zinc layer on the clamps will not influence the functional resistance to fire of the product, as mentioned in clause 6.1 of this document;
- 4) tested screws with X-FB clamps, anchored to steel sheet thickness 2 mm, reached according to document [2] in chap. 3.1 load capacity in fire conditions rated as R-120, which exceeds the functional resistance time of PS 90 cable single clamps, type X-FB, anchored to steel beams with X-EGN fastening nails, according to document [1] in chap. 3.1. Concurrently tested screws with X-FB clamps, anchored to steel sheet thickness 2 mm, were according to document [2] in chap. 3.1 loaded with a weight of 2 kg (each screw with a clamp), which exceeds the maximum load of the X-FB clamps with X-EGN fastening nails in the test, which was 3.03 kg.m⁻¹ and thus 0.91 kg per 1 clamp X- FB;
- 5) single-core cables of the same type as tested, are of the same construction and of the same materials as the tested cables and the reduction in the number of cores does not influence the functional fire resistance of the product as mentioned to in clause 6.1 of this document.



6. CLASSIFICATION AND FIELD OF APPLICATION

6.1 CLASSIFICATION ACCORDING TO DIN 4102-12: 1998-11

The element, simple and double clips, type X-FB and X-DFB with nails X-EGN, X-GHP and X-GN together with power and communication halogen free cables with circuit integrity maintenance in fire is classified according to the following combinations of performance parameters and classes as appropriate.

Used cables PRAKAB PRAŽSKÁ KABELOVNA, s.r.o. by test are classified as follows:

Cable	Type of tested cable, single cross-sections and number of conductors	Arrangement	Classification for type of tested cable (by cross-sections and number of conductors)	Classification for cable $n \times \geq 1,5 \text{ mm}^2$ $n \geq 2$
PRAFlaDur® 90 (N)HXH	PRAFlaDur® 90 (N)HXH-J 4x1,5 RE FE180/P90-R...	In simple clips X-FB 8 MX to X-FB 40 MX. Clips in spacing of 300 mm. Installation to ceiling. Loading by mounted cables. Standard track No. 1.	E 90	$n \times \geq 1,5-50 \text{ mm}^2$ $n \geq 1$ E 90
	PRAFlaDur® 90 (N)HXH-J 5x10 RE FE180/P90-R...		E 90	
	PRAFlaDur® 90 (N)HXH-J 4x50 RE FE180/P90-R...		E 90	
PRAFlaGuard® F SSKFH-V180	PRAFlaGuard® F SSKFH-V180 1x2x0,8 P90-R...		E 90	$n \times 2 \times \geq 0,8 \text{ mm}$ $n \geq 1$ E 90

Cable	Type of tested cable, single cross-sections and number of conductors	Arrangement	Classification for type of tested cable (by cross-sections and number of conductors)	Classification for cable $n \times \geq 1,5 \text{ mm}^2$ $n \geq 2$
PRAFlaDur® 90 (N)HXH	PRAFlaDur® 90 (N)HXH-J 4x1,5 RE FE180/P90-R...	Double clips from X-DFB 16 MX to X-DFB 28 MX. Installation to ceiling. Spacing of clips 300 mm. Standard track No. 1.	E 90	$n \times \geq 1,5-35 \text{ mm}^2$ $n \geq 1$ E 90
	PRAFlaDur® 90 (N)HXH-J 5x10 RE FE180/P90-R...		E 90	
	PRAFlaDur® 90 (N)HXH-J 4x35 RE FE180/P90-R...		E 90	
PRAFlaGuard® F SSKFH-V180	PRAFlaGuard® F SSKFH-V180 1x2x0,8 P90-R...		E 90	$n \times 2 \times \geq 0,8 \text{ mm}$ $n \geq 1$ E 90

Cable	Type of tested cable, single cross-sections and number of conductors	Arrangement	Classification for type of tested cable (by cross-sections and number of conductors)	Classification for cable $n \times \geq 1,5 \text{ mm}^2$ $n \geq 2$
PRAFlaDur® 90 (N)HXH	PRAFlaDur® 90 (N)HXH-J 4x1,5 RE FE180/P90-R...	Simple clips from X-FB 8 MX to X-FB 40 MX. Installation to steel profile. Spacing of clips 300 mm. Standard track No. 7.	E 90	$n \times \geq 1,5-50 \text{ mm}^2$ $n \geq 1$ E 30
	PRAFlaDur® 90 (N)HXH-J 5x10 RE FE180/P90-R...		E 60	
	PRAFlaDur® 90 (N)HXH-J 4x50 RE FE180/P90-R...		E 30	
PRAFlaGuard® F SSKFH-V180	PRAFlaGuard® F SSKFH-V180 1x2x0,8 P90-R...		E 90	$n \times 2 \times \geq 0,8 \text{ mm}$ $n \geq 1$ E 90

The product, simple and double clips, type X-FB and X-DFB with nails X-EGN, X-GHP and X-GN together with power and communication halogen free cables with circuit integrity maintenance in fire is classified to classes according to achieved results of tested cables at individual tracks. Another classification is not allowed.



6.2 FIELD OF APPLICATION

This classification is valid for the following end use applications:

- throughout the period during which circuit integrity is to be maintained, neighboring building components shall not have a negative effect on circuit integrity;
- although testing is only carried out on cables arranged horizontally, test results also apply to cables arranged either diagonally or vertically (e.g. in risers), as long as the cable system is supported in transitional areas (i.e. where it switches from a horizontal to a vertical arrangement) in such a manner that the cables will not slip or kink at corners;
- test results of function in fire test of cables tested at standard supporting construction are also applicable for cables of other producers tested at standard supporting construction;
- where risers are used, circuit integrity classification only applies if the cable is effectively supported (i.e. with a spacing of supports of 3 500 mm or less and the distance between cable clips is ≤ 300 mm). Figure 5 of standard DIN 4102-12 shows a suitable means of mounting cables on risers. Cables may also be stabilized by a seal at penetrations in floors, provided that the sealant material is of a suitable material class, or using clips of proven suitability. The suitability of any design other than that shown in figure 5 may only be assessed by an accredited test laboratory;
- for vertical systems, the test results obtained for cables mounted singly on the ceiling using single clips apply. Brackets of proven suitability may also be used, as long as their spacing is equal to that of the single clips tested;
- test results of testing single cables on the ceiling apply also to cables mounted horizontally on walls;
- **classification for type of cable by cross-sections and number of conductors (in art. 6.1) is valid only for tested cable types, number and cross-sections of conductors;**
- **classification for cable (in art. 6.1) is valid for all numbers and cross-sections of tested cable type;**
- **test result obtained from testing of cables with five or four conductors applies also to cables of the same type with smaller or greater number of conductors;**
- **test results of cables are applicable only for tested simple and double clips, type X-FB and X-DFB with nails;**
- **test results of function in fire test of cables in simple or double clips of cables in tested clamps X-FB 8 MX to X-FB 40 MX and double clamps X-DFB 16 MX to X-DFB 28 MX on standard supporting structure (spacing of clamps 300 mm) are also applicable for cables of other manufacturers that are tested on a standard design with a functional fire resistance class equal to or higher than classified cables;**
- **it is possible to applied test results of function in fire test of cables on clips X-FB 5 MX to X-FB 7 MX and double clips X-DFB 5 MX to X-DFB 13 MX under the conditions of usage of cables with same diameter as in tested clips of another manufacturers, which were tested at standard construction;**
- **test results of function in fire test of cables in simple or double clips tested with nails X-GHP 18 is able to applied also for cables in simple or double clips which are attached with other type of nails, referred to in point 2.2 and in point 4. in compliance with the specified base material for the nail;**
- **test results of function in fire test of cables in simple or double clips type X-FB and X-DFB is able to applied also for cables with smaller diameter then 8 mm (e.g. 6 mm);**
- **test results of the function in fire of cable systems with standard load-bearing structures, which are composed of single clips X-FB fixed to steel beams by nails X-EGN, can be applied to standard load-bearing structures of single clips X-FB fastened with self-tapping screws S-MS 01 Z 4,8x20 to steel sheet minimum thickness 2 mm, provided that the conditions, that the fastening of the load-bearing and fastening structure will be only to such a building structure that statically allows it and meets the property of fire resistance R according to STN EN 13501-2 at least in the required time of functional resistance.**



6.4 LABELING OF CABLE TRACK

The contractor shall always label the cable track at the accessible place and by permanent way. Label contains following information:

- the name of individual or legal person whose workers have installed the system;
- indication of cable bearing system which is stated in classification report;
- class of function in fire, number of classification report;
- year of installation of cable bearing system.

If the track is long, it is appropriate to repeat the labelling approximately every 50 m.

7. LIMITATIONS

Load-bearing construction elements for fixing of cable systems must be proved for at least the same fire resistance compare to classified function in fire of cable system.

The construction contractor is solely responsible for proper preparation.

This classification document does not represent type approval or certification of the product.

The classification is valid until 28. 06. 2026 provided that the product, field of application and standards and regulations are not changed.

Approved by:

Ing. Štefan Rástocký
Head of the testing laboratory

Prepared by:

Miroslav Hudák
Technician of the testing laboratory