

FUNCTION IN FIRE EXPERT JUDGEMENT REPORT WITH CLASSIFICATION FIRES-JR-130-22-NURE

Cable supporting system NIEDAX with halogen-free power cables of Dätwyler

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FUNCTION IN FIRE EXPERT JUDGEMENT REPORT WITH CLASSIFICATION IN ACCORDANCE WITH STN 92 0205: 2014/Z1: 2019

FIRES-JR-130-22-NURE

Name of the product: Cable supporting system NIEDAX with halogen-free power cables of Dätwyler

Sponsor: Dätwyler IT Infra AG
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1. INTRODUCTION

This expert judgement report with classification defines the function in fire classification assigned to element „Cable supporting system Niedax GmbH & Co. KG with halogen-free power cables of Dätwyler IT Infra AG” in accordance with the classes given in STN 92 0205: 2014/ Z1: 2019.

This expert judgement report defines field of application which is outside the field of direct application according test standard or outside the field of extended application according to relevant extended application standard.

2. DETAILS OF CLASSIFIED PRODUCT

2.1 GENERAL

The element, Cable supporting system Niedax GmbH & Co. KG with halogen-free power cables of Dätwyler IT Infra AG, is defined as a cable supporting system for power and communication halogen free cables with circuit integrity maintenance in fire.

2.2 PRODUCT DESCRIPTION

The element comprises of cable supporting system of company Niedax GmbH & Co. KG (cable trays, cable ladders, cable group holders, consoles, brackets, threaded rods, cable clips and accessories) with halogen-free power cables of company Dätwyler IT Infra AG with circuit integrity maintenance in fire.

Cable tray RLVC 60

Cable tray is made of steel sheet 0,9 mm thick. Height of side wall is 60 mm and maximum tested width is 400 mm. Trays are fixed together by integrated plug-in connectors and nut bolts FLM 6x12 (1pc per side and 2 pcs on the bottom). Maximum tested loading is 20 kg.m⁻¹. Tested cable tray is RLVC 60.400.

Cable ladder STL 60

Cable ladder is made of steel sheet thickness 1,5 mm and spacing of transoms is 300 mm. Cross-section dimensions of transoms are (30 x 15 x 1,5) mm. Height of side wall is 60 mm and maximum tested width of cable ladder is 400 mm. Cable ladders are fixed together by two side connectors KLVB 60/4 with nut bolts FLM8x13 (4 pcs per connector). Maximum tested loading is 20 kg.m⁻¹. Tested ladder is STL 60.403.

C-profile 2970

Profile with dimensions (30 x 15) mm is made of bent steel sheet 1,5 mm thick. Profile is used for fixing of cables to ceiling and wall by cable clips.

Console HU 5050

Console consists of base plate with dimensions (140 x 80 x 5) mm and support with dimensions (50 x 50 x 2,5) mm. Console is used for gripping of brackets to ceiling.

Holder WWU

Holder WWU150/8 is made of L-shape steel sheet 5,0 mm thick with dimensions (60 x 60) mm and 40 mm wide. Holders are used for fixation of ladders to ceiling.

Bracket KTAS

Bracket consists of two parts – base plate (163 x 60 x 8 mm) and bent steel sheet (103,6 x 430 x 2 mm) welded together. Brackets are used for fixation of trays and ladders to consoles.

Spacer HDS

Spacer is made of bent steel sheet 1,5 mm thick with dimensions (80 x 43) mm. Spacers are used for reinforcement of consoles at place of brackets fixation.

Cable clip SAS

Cable clip consists of two parts made of bent steel sheet from 1,2 to 2,0 mm thick and is used for fixation of cables to ceiling or wall.

**Cable clamps “B”**

Cable clamp consists of two parts made of bent steel sheet from 1,5 to 2,0 mm thick and is used for fixation of cables to ceiling or wall.

Cable group holder SHUD V1

Cable group holder with dimensions (110 x 93 x 80) mm is made of steel sheet 1,5 mm thick and is used for fixation of cables to wall.

Aluminium tube IESR 63 AL

Aluminium tubes IESR 63 AL with a circumference of Ø 63 mm and a wall thickness of 1,5 mm is used for cable routing

Cables

Power and communication free halogen cables are specified for stationary distribution of electrical energy in dry and damp premises. Since they are free from halogens and exhibit enhanced fire performance, these cables are used in those applications where in the event of fire, the negative effect on concentrations of people and valuable material goods must be minimized. Suitable for hotels, hospitals, underground railways, airport etc. to protect people and technical building equipment in the event of fire where there is requirement for maintaining the functional integrity all cable installation in the event of fire. The cables develop in case of fire low heat released rate and smoke and no burning particles drop away during fire accident. Functional integrity all cable installation in the event of fire is guaranteed only with use specified supporting member and cables grips.

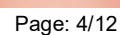
The cables used for the test:Power cables:

DATWYLER KERAM (N)HXH-J FE180 E90 B2ca-s1a, d1, a1, 1kV 4x1,5
DATWYLER KERAM (N)HXH-J FE180 E90 B2ca-s1a, d1, a1, 1kV 4x16
DATWYLER KERAM (N)HXH-J FE180 E90 B2ca-s1a, d1, a1, 1kV 4x50
DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca-s1a, d1, a1, 1 kV 4x1,5
DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca-s1a, d1, a1, 1 kV 4x50
DATWYLER KERAM (N)HXCH FE180 E90 B2ca-s1a, d1, a1, 1kV 4x1,5/1,5
DATWYLER KERAM (N)HXCH FE180 E90 B2ca-s1a, d1, a1, 1kV 4x50/25

The length of cables was 5,2 m and 4,0 m from that was exposed to fire.

More detailed information about product construction is shown in the drawings which form an integral part of test report [1]. Drawings were delivered by sponsor.

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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 sponsor	Test report No.	Date of the test	Test method
[1]	FIRES, s.r.o., Batizovce, SR	Dätwyler IT Infra AG, Altdorf, Switzerland	FIRES-FR-167-22-AUNE	16. 06. 2022	STN 92 0205: 2014 / Z1: 2019

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	S1	2 cables DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca....., 1 kV 4x50	E2	0 minutes no failure / interruption
	S2	2 cables DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca....., 1 kV 4x1,5		0 minutes
	S3	2 cables DATWYLER KERAM (N)HXCH FE180 E90 B2ca....., 1kV 4x50/25	E3	0 minutes no failure / interruption
	S4	2 cables DATWYLER KERAM (N)HXCH FE180 E90 B2ca....., 1kV 4x1,5/1,5		2 minutes
	S5	2 cables DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca....., 1 kV 4x50	C2	0 minutes no failure / interruption
	S6	2 cables DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca....., 1 kV 4x1,5		2 minutes
	S7	DATWYLER KERAM (N)HXCH FE180 E90 B2ca....., 1kV 4x1,5/1,5		0 minutes no failure / interruption
	S8	DATWYLER KERAM (N)HXCH FE180 E90 B2ca....., 1kV 4x50/25		0 minutes no failure / interruption
	S9	2 cables DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca....., 1 kV 4x1,5	D3	0 minutes
	S10	2 cables DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca....., 1 kV 4x50		0 minutes no failure / interruption
	S11	2 cables DATWYLER KERAM (N)HXCH FE180 E90 B2ca....., 1kV 4x1,5/1,5	D2	0 minutes no failure / interruption
	S12	2 cables DATWYLER KERAM (N)HXCH FE180 E90 B2ca....., 1kV 4x50/25		0 minutes no failure / interruption
	S13	2 cables DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca....., 1 kV 4x1,5	B1	0 minutes no failure / interruption
	S14	2 cables DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca....., 1 kV 4x50		0 minutes no failure / interruption
	S15	2 cables DATWYLER KERAM (N)HXCH FE180 E90 B2ca....., 1kV 4x1,5/1,5		0 minutes no failure / interruption
	S16	2 cables DATWYLER KERAM (N)HXCH FE180 E90 B2ca....., 1kV 4x50/25		0 minutes no failure / interruption
	S17	2 cables DATWYLER KERAM (N)HXH-J FE180 E90 B2ca....., 1kV 4x1,5		0 minutes
	S18	2 cables DATWYLER KERAM (N)HXH-J FE180 E90 B2ca....., 1kV 4x50		0 minutes no failure / interruption
	S19	2 cables DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca....., 1 kV 4x1,5	B2	0 minutes no failure / interruption
	S20	2 cables DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca....., 1 kV 4x50		0 minutes no failure / interruption
	S21	2 cables DATWYLER KERAM (N)HXCH FE180 E90 B2ca....., 1kV 4x1,5/1,5		2 minutes
	S22	2 cables DATWYLER KERAM (N)HXCH FE180 E90 B2ca....., 1kV 4x50/25		0 minutes no failure / interruption
	S23	2 cables DATWYLER KERAM (N)HXH-J FE180 E90 B2ca....., 1kV 4x1,5	A1	2 minutes
	S24	2 cables DATWYLER KERAM (N)HXH-J FE180 E90 B2ca....., 1kV 4x50		0 minutes no failure / interruption
	S25	2 cables DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca....., 1 kV 4x1,5		7 minutes
	S26	2 cables DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca....., 1 kV 4x50		0 minutes no failure / interruption
	S27	2 cables DATWYLER KERAM (N)HXCH FE180 E90 B2ca....., 1kV 4x1,5/1,5		0 minutes no failure / interruption
	S28	2 cables DATWYLER KERAM (N)HXCH FE180 E90 B2ca....., 1kV 4x50/25		0 minutes no failure / interruption
	S29	2 cables DATWYLER KERAM (N)HXH-J FE180 E90 B2ca....., 1kV 4x1,5	A1	0 minutes no failure / interruption
	S30	2 cables DATWYLER KERAM (N)HXH-J FE180 E90 B2ca....., 1kV 4x50		0 minutes no failure / interruption
	S31	2 cables DATWYLER KERAM (N)HXH-J FE180 E90 B2ca....., 1kV 4x50		0 minutes no failure / interruption
	S32	2 cables DATWYLER KERAM (N)HXH-J FE180 E90 B2ca....., 1kV 4x1,5		0 minutes no failure / interruption
	S33	DATWYLER KERAM (N)HXCH FE180 E90 B2ca....., 1kV 4x50/25	C1	7 minutes
	S34	DATWYLER KERAM (N)HXCH FE180 E90 B2ca....., 1kV 4x1,5/1,5		0 minutes no failure / interruption
	S35	2 cables DATWYLER KERAM (N)HXH-J FE180 E90 B2ca....., 1kV 4x1,5		0 minutes no failure / interruption
	S36	2 cables DATWYLER KERAM (N)HXH-J FE180 E90 B2ca....., 1kV 4x50		0 minutes no failure / interruption
	S37	2 cables DATWYLER KERAM (N)HXH-J FE180 E90 B2ca....., 1kV 4x16	F1	0 minutes
	S38	2 cables DATWYLER KERAM (N)HXH-J FE180 E90 B2ca....., 1kV 4x1,5		2 minutes
	S39	2 cables DATWYLER KERAM (N)HXH-J FE180 E90 B2ca....., 1kV 4x50	E1	0 minutes no failure / interruption
	S40	2 cables DATWYLER KERAM (N)HXH-J FE180 E90 B2ca....., 1kV 4x1,5		2 minutes



The fire test was terminated in the 93rd minute upon request of test sponsor.

Specimens S1 – S40 were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W. Circuit breakers with rating 3 A and performance characteristics B(gL) were used.

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

- Beyond the range of extended application in this expert judgement report is allowed to use a power cables also with one conductor.

5. REASONS SUPPORTING THE PERMIT OF CHANGES

- Number of conductors will not affect of functional resistance in fire, if the same cable construction is maintained.

6. CLASSIFICATION AND FIELD OF APPLICATION

6.1 CLASSIFICATION

The element, cable supporting system of company Niedax GmbH & Co. KG (cable trays, cable mesh trays, cable ladders, support channels, brackets and accessories) with halogen-free power and communication cables of company Dätwyler IT Infra AG with circuit integrity maintenance in fire, is classified according to the following combinations of performance parameters and classes as appropriate.

Used cables of company Dätwyler IT Infra AG 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
DATWYLER KERAM (N)HXH FE180 E30-E60	DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca-s1a, d1, a1, 1 kV 4x1,5	Track is made of C-profiles 2970 fixed to ceiling in spacing of 300 mm. Cables are fixed to profiles by cable clamps type "SAS". Ceiling installation. Standard track A1.	PS 60	n x ≥1,5 mm ² n ≥1 PS 60
	DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca-s1a, d1, a1, 1 kV 4x50		PS 90	
DATWYLER KERAM (N)HXH FE180 E90	DATWYLER KERAM (N)HXH-J FE180 E90 B2ca-s1a, d1, a1, 1kV 4x1,5		PS 90	n x ≥1,5 mm ² n ≥1 PS 90
	DATWYLER KERAM (N)HXH-J FE180 E90 B2ca-s1a, d1, a1, 1kV 4x50		PS 90	
DATWYLER KERAM (N)HXCH FE180 E90	DATWYLER KERAM (N)HXCH FE180 E90 B2ca-s1a, d1, a1, 1kV 4x1,5/1,5		PS 90	n x ≥1,5/1,5 mm ² n ≥1 PS 90
	DATWYLER KERAM (N)HXCH FE180 E90 B2ca-s1a, d1, a1, 1kV 4x50/25		PS 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
DATWYLER KERAM (N)HXH FE180 E30-E60	DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca-s1a, d1, a1, 1 kV 4x1,5	Track is made of C-profiles 2970 fixed to ceiling in spacing of 300 mm. Cables are fixed to profiles by cable clamps type "B". Ceiling installation. Standard track B1.	PS 90	n x ≥1,5 mm ² n ≥1 PS 90
	DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca-s1a, d1, a1, 1 kV 4x50		PS 90	
DATWYLER KERAM (N)HXH FE180 E90	DATWYLER KERAM (N)HXH-J FE180 E90 B2ca-s1a, d1, a1, 1kV 4x1,5		PS 60	n x ≥1,5 mm ² n ≥1 PS 60
	DATWYLER KERAM (N)HXH-J FE180 E90 B2ca-s1a, d1, a1, 1kV 4x50		PS 90	
DATWYLER KERAM (N)HXCH FE180 E90	DATWYLER KERAM (N)HXCH FE180 E90 B2ca-s1a, d1, a1, 1kV 4x1,5/1,5		PS 90	n x ≥1,5/1,5 mm ² n ≥1 PS 90
	DATWYLER KERAM (N)HXCH FE180 E90 B2ca-s1a, d1, a1, 1kV 4x50/25		PS 90	
DATWYLER KERAM (N)HXH FE180 E30-E60	DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca-s1a, d1, a1, 1 kV 4x1,5	Track is made of C-profiles 2970 fixed to ceiling in spacing of 600 mm. Cables are fixed to profiles by cable clamps type "B". Ceiling installation. Non-standard track B2.	PS 90	n x ≥1,5 mm ² n ≥1 PS 90
	DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca-s1a, d1, a1, 1 kV 4x50		PS 90	
DATWYLER KERAM (N)HXH FE180 E90	DATWYLER KERAM (N)HXH-J FE180 E90 B2ca-s1a, d1, a1, 1kV 4x1,5		PS 60	n x ≥1,5 mm ² n ≥1 PS 60
	DATWYLER KERAM (N)HXH-J FE180 E90 B2ca-s1a, d1, a1, 1kV 4x50		PS 90	
DATWYLER KERAM (N)HXCH FE180 E90	DATWYLER KERAM (N)HXCH FE180 E90 B2ca-s1a, d1, a1, 1kV 4x1,5/1,5		PS 30	n x ≥1,5/1,5 mm ² n ≥1 PS 30
	DATWYLER KERAM (N)HXCH FE180 E90 B2ca-s1a, d1, a1, 1kV 4x50/25		PS 90	
DATWYLER KERAM (N)HXH FE180 E30-E60	DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca-s1a, d1, a1, 1 kV 4x1,5	In cable ladders STL 60.403 fixed to ceiling at up-side down position by corner angles WWU 150/8. Cables fixed to ladder by cable clamps type B in spacing of 300 mm. Fixation in spacing of 1200 mm. Maximum loading 20 kg.m ⁻¹ . Ceiling installation. Standard track C1 and C2.	PS 60	n x ≥1,5 mm ² n ≥1 PS 60
	DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca-s1a, d1, a1, 1 kV 4x50		PS 90	
DATWYLER KERAM (N)HXH FE180 E90	DATWYLER KERAM (N)HXH-J FE180 E90 B2ca-s1a, d1, a1, 1kV 4x1,5		PS 90	n x ≥1,5 mm ² n ≥1 PS 90
	DATWYLER KERAM (N)HXH-J FE180 E90 B2ca-s1a, d1, a1, 1kV 4x50		PS 90	
DATWYLER KERAM (N)HXCH FE180 E90	DATWYLER KERAM (N)HXCH FE180 E90 B2ca-s1a, d1, a1, 1kV 4x1,5/1,5		PS 90	n x ≥1,5/1,5 mm ² n ≥1 PS 60
	DATWYLER KERAM (N)HXCH FE180 E90 B2ca-s1a, d1, a1, 1kV 4x50/25		PS 60	



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
DATWYLER KERAM (N)HXH FE180 E90	DATWYLER KERAM (N)HXH-J FE180 E90 B2ca-s1a, d1, a1, 1kV 4x1,5	In cable ladders STL 60.403. Consoles combined of console HU 5050, bracket KTAS 400 and spacer HDS 5050. Consoles in spacing of 1500 mm. Maximum loading 20 kg.m ⁻¹ . Suspended installation. Non-standard track D1.	PS 90	n x ≥1,5 mm ² n ≥1 PS 90
	DATWYLER KERAM (N)HXH-J FE180 E90 B2ca-s1a, d1, a1, 1kV 4x50		PS 90	
DATWYLER KERAM (N)HXH FE180 E30-E60	DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca-s1a, d1, a1, 1 kV 4x1,5	In cable ladders STL 60.403. Consoles combined of console HU 5050, bracket KTAS 400 and spacer HDS 5050. Consoles in spacing of 1500 mm. Maximum loading 20 kg.m ⁻¹ . Suspended installation. Non-standard tracks D2 and D3.	PS 45	n x ≥1,5 mm ² n ≥1 PS 45
	DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca-s1a, d1, a1, 1 kV 4x50		PS 90	
DATWYLER KERAM (N)HXCH FE180 E90	DATWYLER KERAM (N)HXCH FE180 E90 B2ca-s1a, d1, a1, 1kV 4x1,5/1,5	Consoles in spacing of 1500 mm. Maximum loading 20 kg.m ⁻¹ . Suspended installation. Non-standard tracks D2 and D3.	PS 90	n x ≥1,5/1,5 mm ² n ≥1 PS 90
	DATWYLER KERAM (N)HXCH FE180 E90 B2ca-s1a, d1, a1, 1kV 4x50/25		PS 90	
DATWYLER KERAM (N)HXH FE180 E30-E60	DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca-s1a, d1, a1, 1 kV 4x1,5		PS 45	n x ≥1,5 mm ² n ≥1 PS 45
	DATWYLER KERAM (N)HXH-J FE180 E30-E60 B2ca-s1a, d1, a1, 1 kV 4x50		PS 90	
DATWYLER KERAM (N)HXH FE180 E90	DATWYLER KERAM (N)HXH-J FE180 E90 B2ca-s1a, d1, a1, 1kV 4x1,5	Tracks are made of cable group holders SHUD V1 fixed to wall in spacing of 800 mm. Maximum loading 6 kg.m ⁻¹ . Wall installation. Non-standard tracks E1, E2 and E3.	PS 30	n x ≥1,5 mm ² n ≥1 PS 30
	DATWYLER KERAM (N)HXH-J FE180 E90 B2ca-s1a, d1, a1, 1kV 4x50		PS 90	
DATWYLER KERAM (N)HXCH FE180 E90	DATWYLER KERAM (N)HXCH FE180 E90 B2ca-s1a, d1, a1, 1kV 4x1,5/1,5		PS 60	n x ≥1,5/1,5 mm ² n ≥1 PS 60
	DATWYLER KERAM (N)HXCH FE180 E90 B2ca-s1a, d1, a1, 1kV 4x50/25		PS 90	
DATWYLER KERAM (N)HXH FE180 E90	DATWYLER KERAM (N)HXH-J FE180 E90 B2ca-s1a, d1, a1, 1kV 4x1,5	In aluminum tubes IESR 63 AL fixed to wall by cable clamps SAS 60 in spacing of 1200 mm. Maximum loading 3 kg.m ⁻¹ . Wall installation. Non-standard track F1.	PS 60	Without classification
	DATWYLER KERAM (N)HXH-J FE180 E90 B2ca-s1a, d1, a1, 1kV 4x16		Without classification	

The element comprised of Cable supporting system Niedax GmbH & Co. KG with halogen-free power cables of Dätwyler IT Infra AG with circuit integrity maintenance in fire, is classified to classes according to achieved test results of tested cables at tracks.
Other classification is not allowed.



6.2 FIELD OF APPLICATION

This classification is valid for the following end use applications:

General

- the circuit integrity shall not be affected negatively by adjacent building constructions. Although testing is only carried out on test specimens of cable systems arranged horizontally, test results also apply to sloped or vertical arrangement provided the next conditions given in this chapter are met. In such a case the cable system shall be effectively fixed in places where it turns from horizontal to vertical arrangement, i.e. the cable products shall be attached effectively in places of bending;
- direct application of test results obtained from tests of test specimen of cable system support and fixing structures is not possible to another construction project or to any other product from another manufacturer;
- test results obtained for cable system with cable trays are directly applicable also for usage of cable trays coverings; the coverings shall be ensured against movement with a proper manner;
- the condition for validity of direct application of test results is that the support and fixing structure is attached only to such building construction that statically allows it and meets the criterion of fire resistance R according to STN EN 13501-2 at least in the required time of function in fire;
- if the support and fixing structure is fixed directly to a building construction made of a rigid material such as concrete, bricks, aerated concrete or steel load-bearing construction, such anchoring components shall be used, which, in term of their properties, are suitable with respect to used material, used installation method, required thermal attack curve, required period of circuit integrity and mechanical action caused by the support and fixing structure with cables;
- without tests under considered fire temperatures the support and fixing structure may be fixed to a building construction only by means of bolted joints, riveted joints and welded joints made of elements standardized in term of their material and dimensions;
- in case when it is not possible to fix the support and fixing structure directly to a building construction, an additional construction may be used. Design of such construction shall apply all principles for design of support and fixing structure withstanding the fire effects for specified period. It is possible to verify the additional construction properties by means of a calculation in accordance with Eurocodes or by a test; for attachment of the additional construction to an element of building construction all requirements given in clauses 7.1.5 and 7.1.6 of STN 92 0205 apply;
- direct application of function in fire test results must not lead to such construction solutions of cable systems that are in conflict particularly with requirements of chapter 522 of standard STN 33 2000-5-52 and with the requirements of the method of installing cables in electrical installations according to the technical standard.

Cable systems with integrated circuit integrity maintenance

- when cable test specimens according to 6.4.4.1.2 or 6.4.4.1.4 or 6.4.4.1.5 of STN 92 0205 are used the test results are directly applicable to all constructions of tested type of cable product in a specific type of cable system. It is not permitted to transfer the test results between support and fixing structures, which in any parameter differ from standard support structures;
- test results of cable systems obtained from tests with standard support structures from specified manufacturer are directly applicable also to tested cable systems with standard support structures of the same type from another manufacturer;
- test results of cable systems with cable trays or cable ladders are applicable to all cable trays and cable ladders with the same construction and with width less than tested. Direct application of test results is possible also to other methods of joining of cable trays and cable ladders than shown on Figure 3b) of STN 92 0205 provided they are assessed by an accredited testing laboratory;
- support structures made of mesh cable trays according to STN EN 61537 are not considered to be standard support structures. In case of test specimens of support structures made according to STN EN 61537 of steel with a finishing the test results are directly applicable also to support structures of the same type and made of stainless steel but not vice versa;
- if a non-standard support structure is tested than the test results may be directly applied also to a similar standard support structure within a range stated by accredited testing laboratory;
- test results of a test specimen of cable system with cable trays or cable ladders which are suspended on the floor using suspension devices are directly applicable to these cable systems fixed to a wall;
- test results of a test specimen of cable system with cable trays or cable ladders are directly applicable to all cable system parts used for changing of direction or dimension or for termination of lengths (elbows, fittings of shape T, cross elements) provided that individual disposition has been assessed by an accredited testing laboratory;



- in case of test with specimen of cable system with cable trays or cable ladders with joining point positioned in the middle of distance between supporting constructions, allowance of $\pm 5\%$, test result is directly applicable to any position of joining point between supporting constructions. If the position of joining point is closer to one of supporting constructions the test result is directly applicable only in case the point of cable tray or cable ladder joining is positioned in this reduced distance from supporting construction;
- test results of a test specimen of cable system with cable trays or cable ladders may be directly applied also in case of finishing by means of a coloured paint or spray representing a non-substantial component according to STN EN 13501-1; this painting or spraying may be realised only by manufacturer of cable trays or ladders. If the thickness of finishing layer is greater than given in STN EN 13501-1 a test according this standard shall be carried out;
- test results obtained from test of specimen of cable system with cable clips under the floor are directly applicable also to a horizontal cable system with cable clips on the wall;
- test results obtained from test of specimen of cable system with cable clips are directly applicable also to attachment of a number of cable products into one cable clip but maximal of three. For arrangement of more than 3 cables into one clip it a test shall be carried out;
- test results from test of cable system with cable clips under the floor are directly applicable to vertical cable system with cable clips on a wall provided that the cable product in cable system is effectively fixed (i.e. the distance between effective fixings is $\leq 3\,500$ mm and the distance between cable clips is ≤ 300 mm) according to standard;
- effective method of fixing of cable system according to Figure 5a) requires the usage of metal cable clips tested in standard support structures which are protected (spacing between protected clips is $\leq 3\,500$ mm) by cladding and sealing against direct effect of heat exposition. The suitability of such protection solution must be assessed by and accredited testing laboratory;
- another method of efficient fixing of cable product in a vertical cable system with cable clips using so-called meander dilatation fixing is shown on Figure 5b) of STN 92 0205;
- cable product in a vertical cable system with cable clips may be effectively fixed also by means of sealing of openings in ceilings and floors according to Figure 5c) of STN 92 0205 provided that the penetration seal satisfies fire resistance classification according to STN EN 13501-2 with period at least equal to period of cable system circuit integrity. However penetration seal fire resistance requirements resulting from fire safety disposition of the building according to relevant enactments are not affected;
- for vertical cable system with cable clips it is allowed to arrange more than one cable product into one clip but maximum of 3. For arrangement of more than 3 cable products into one clip it is necessary to carry out test with a method of effective fixing of cable products according to 7.4.12 of STN 92 0205;
- test results obtained from test with specimen of cable system with cable clips are directly applicable also to usage of protective tube for mechanical protection of cable product in accordance with conditions given in 7.6 of STN 92 1101-1. Different application of protective tube is considered as non-standard support structure; such structure shall be tested according to this standard and test result may be directly applied only to a horizontal arrangement;
- to achieve full classification of cable product of specified type it is possible to combine test results from two tests only after an assessment by approved testing laboratory;
- if a test specimen of cable for distribution of electric power with maximal cross-section of conductor less than 50 mm^2 is used, than test results are directly applicable to all cross-sections of conductors within a range from minimal to maximal tested conductor cross-section;
- in case of cable products for distribution of electric power with five or four conductors test results from tests with cable test specimen are directly applicable also to cable products with a less number of conductors (excepting cable products with one conductor);
- if test specimens of cables for electric power distribution with cross-section and number of conductors other than specified, than test results are directly applicable only to tested type of cable product with tested cross-section of conductor and type of cable system;
- in case only cable products for electric power distribution with minimal or maximal cross- section of the conductors passed the test satisfactorily, the test results are directly applicable only to tested type and cross-section of conductors and type of cable system;
- test results from testing of a test specimen of cables for control and communication are directly applicable to all constructions of specified type with diameter and number of conductors equal to or greater than those in cable test specimen;
- when test specimens of control and communication cables with a higher number of conductors are tested the test results are directly applicable only to cable product types with a number of conductors



equal to or greater than that tested. The test results are directly applicable only to cable products with the same or greater diameter of conductor as used in cable test specimen;

Products used for connection of cables

- test results obtained for products used for connection of cables may be directly applied also to an application with cable products from another manufacturer which were tested following this standard and those constructional realisation was assesses by an approved testing laboratory;

6.3 FIELD OF EXTENDED APPLICATION

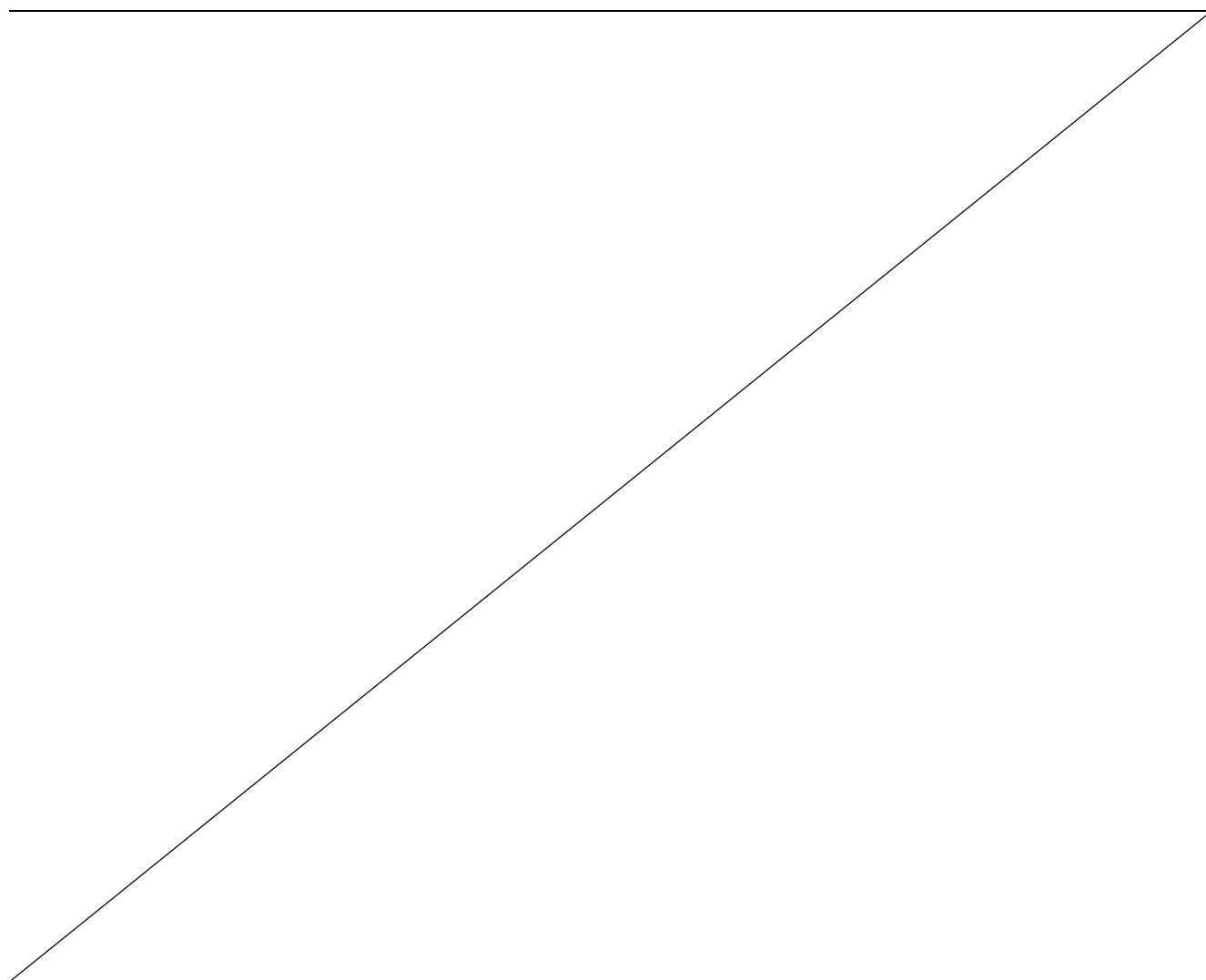
- classification for type of cable (by cross-sections and number of conductors) is valid only for tested cable types, number and cross-sections of conductors;
- classification for cable is valid for all numbers and cross-sections of tested cable type;
- test results of cable systems placed on a non-standard support structures are directly applied only to the tested cable systems;

6.4 LABELING OF CABLE TRACK

Contractor marks cable system by attachment of label which must contain the following informations:

- name of responsible person, who installed the system;
- name of cable system as it is stated in this judgement;
- class of circuit integrity maintenance and classification report number;
- real value of mechanical loading of cable system by cables
- date of assembly of cable 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 provided that the product, field of application and standards and regulations are not changed.

Approved by:

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Head of the testing laboratory

Prepared by:

Ing. Slavomír Hudák
Technician of the testing laboratory

