

FUNCTIONAL RESISTANCE IN FIRE EXPERT JUDGEMENT REPORT WITH CLASSIFICATION FIRES-JR-087-24-NURE

**Cable supporting system NIEDAX with halogen-free power
and communication cables Bitner**

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FUNCTIONAL RESISTANCE IN FIRE EXPERT JUDGEMENT REPORT WITH CLASSIFICATION IN ACCORDANCE WITH ČSN 73 0895: 2016

FIRES-JR-087-24-NURE

Name of the product: Cable supporting system NIEDAX with halogen-free power and communication cables Bitner

Sponsor: Niedax GmbH & Co. KG
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1. INTRODUCTION

This expert judgement report with classification defines the functional resistance in fire classification assigned to element Cable supporting system NIEDAX with halogen-free power and communication cables Bitner in accordance with the classes given in ČSN 73 0895: 2016.

The test was carried out according to standard STN 92 0205 and meets also all requirements of ČSN 73 0895: 2016 and test results can be directly used for classification of tested products according to ČSN 73 0895: 2016.

This expert judgement report defines field of direct application and field of extended application according test standard.

This product has already been classified by FIRES, s.r.o. and number of previous fire resistance expert judgement report with classification is FIRES-JR-006-16-NURE (issued on 23. 01. 2019) with validity until 23. 01. 2024. Document FIRES-JR-087-24-NURE replaces expert judgement report with classification FIRES-JR-006-19-NURE.

2. DETAILS OF CLASSIFIED PRODUCT

2.1 GENERAL

The element, Cable supporting system NIEDAX with halogen-free power and communication cables Bitner, is defined as a cable supporting system for power and communication halogen free cables with circuit integrity maintenance.

2.2 PRODUCT DESCRIPTION

Product comprised of cable supporting system NIEDAX (cable trays, mesh trays, ladders with accessories) with halogen-free power and communication cables Bitner.

Cable supporting system of Niedax:

Cable tray RLVC 60

Cable tray is made of steel sheet thickness 0,75 mm, 0,8 mm or 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) or alternatively by connectors RVV50 with nut bolts. Maximum tested loading is 20kg.m⁻¹. Tested cable trays are RLVC 60.300 and RLVC 60.400.

Cable tray RL 110

Cable tray is made of steel sheet thickness 0,8 mm, 0,9 mm or 1,0 mm thick. Height of side wall is 110 mm and maximum tested width is 400 mm. Trays are fixed together by connectors (RV 110.400) with nut bolts (FLM 6x12). Maximum tested loading is 20kg.m⁻¹. Tested cable tray is RL 110.400.

Cable mesh tray MTC 54

Cable mesh tray is made of longitudinal steel wires either ø 3,9 mm or ø 4,8 mm and transverse steel wires ø 3,9 mm, ø 4,8 mm or ø 5,8 mm. Height of side wall is 54,0 mm and maximum tested width of cable mesh tray is 400 mm. Mesh trays are fixed together by integrated plug-in connectors or alternatively by nut bolts GRHKM 6x15. Maximum tested loading is 15kg.m⁻¹. Tested mesh tray is MTC 54.400.

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 20kg.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.

C-profile 2987

Profile with dimensions (48 x 22) mm is made of bent steel sheet 1,75 mm thick. Profile is used for suspension of trays and ladders.

C-profile 2986

Profile with dimensions (40 x 22) mm is made of bent steel sheet 2,0 mm thick. Profile is used for suspension of trays and ladders.

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.

Bracket KTA and KTAG

Bracket consists of two parts – base plate (from 4,0 to 6,0 mm thick) and bent steel sheet (from 1,5 to 2,0 mm thick) welded together. Brackets are used for fixation of trays and ladders.

Support TAH

Support consists of two parts and is made of bent steel sheet 4,0 mm thick and 30 mm wide. Support is used for suspension of trays and ladders.

Trapezoidal hanger DBT 40

Hanger is made of bent steel sheet 1,5 mm thick.

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.

Suspension hanger DBG

Hanger consists of two part made of bent steel sheet with dimensions (58 x 54 x 4) mm. Hanger is used for fixation of threaded rod to ceiling or wall.

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.

All parts of cable supporting systems are made of galvanized steel according to EN ISO 1461.

Steel chains were used for additional loading of tracks.

Cables

Halogen-free cables are used for applications in public buildings, where fire would present a significant hazard to human life as a result of emission of toxic gasses and dense smoke hampering the evacuation or when the losses caused by the corrosive acid gasses would be higher than other damage caused by fire.

Cables used by test:Power cables:

BiTflame®1000 FE180/PH90/E90 0,6/1kV
BiTflame®1000C FE180/PH90/E90 0,6/1kV
NHXH FE180/E90 0,6/1kV
NHXCH FE180/E90 0,6/1kV
(N)HXH FE180/E90 0,6/1kV
(N)HXCH FE180/E90 0,6/1kV



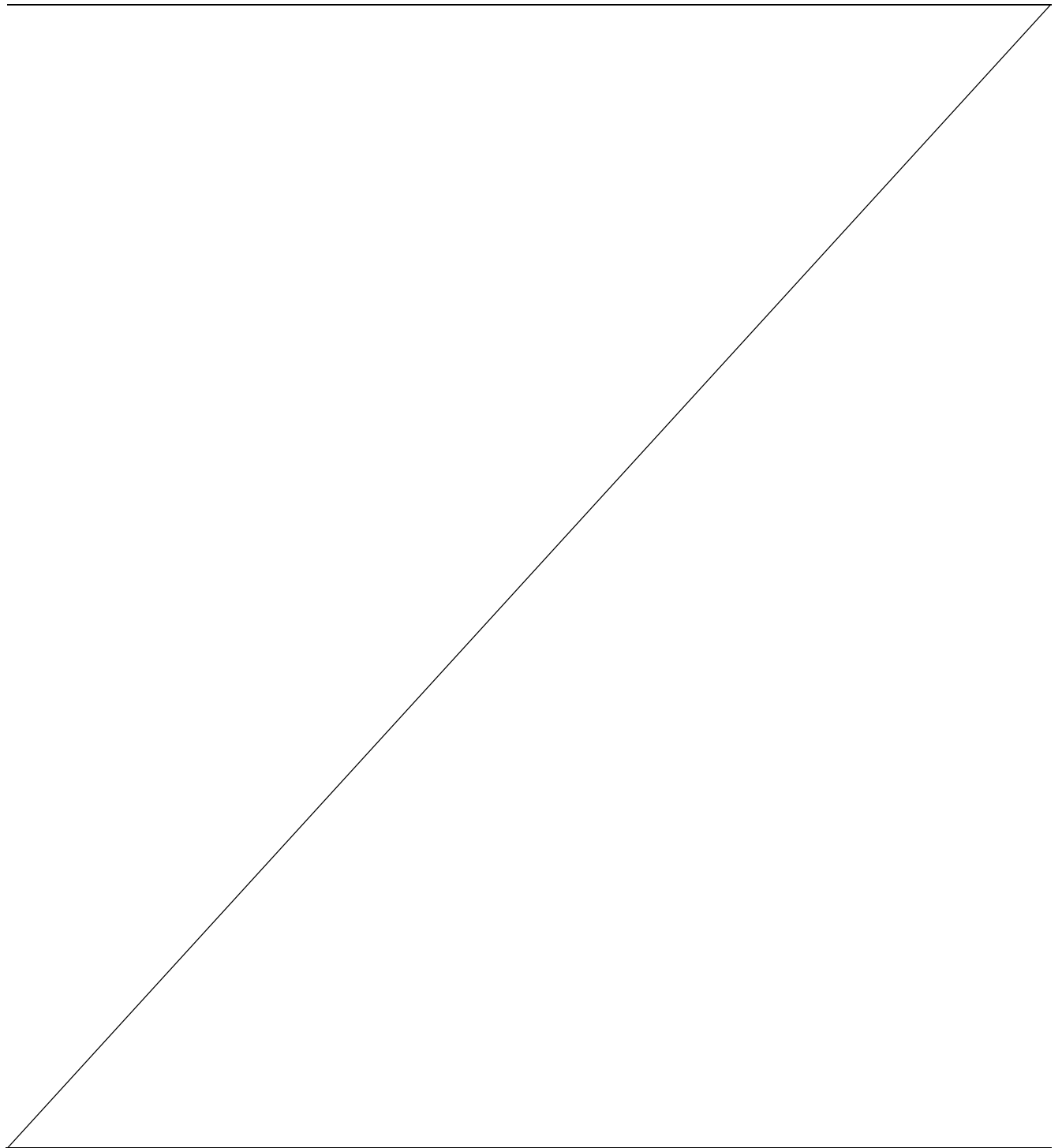
Communication cables:

HTKSH FE180/PH90/E90 225V
HTKSHekw FE180/PH90/E90 225V
HDGs FE180/PH90/E90 300/500V
HDGsekwf FE180/PH90/E90 300/500V

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

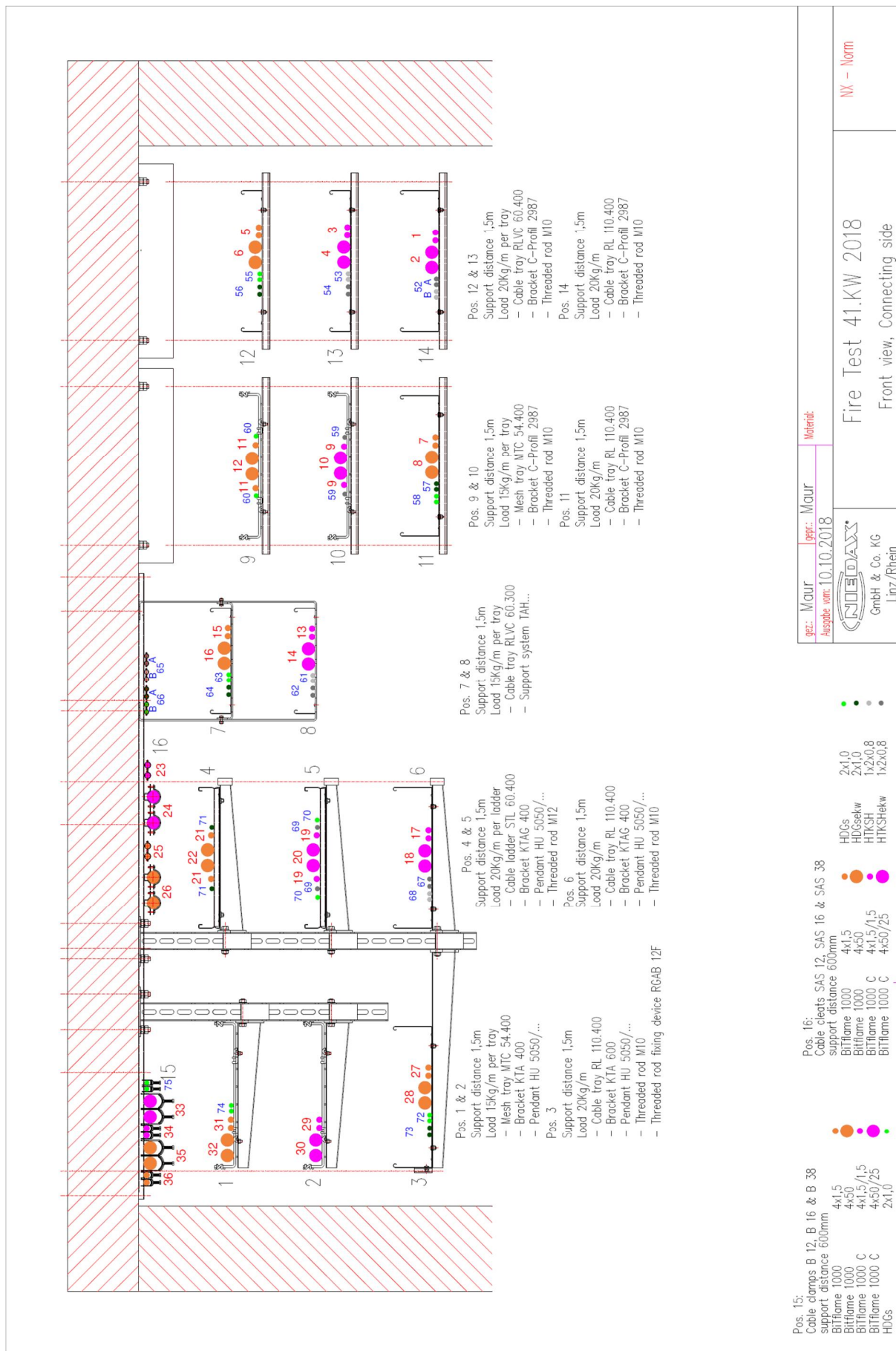
Cable penetration through the wall of test furnace was sealed by mineral wool and sprayed insulation material Tecwool.

More detailed information about product construction is shown in test reports [1] and [2].





Constructions tested by test [2]:





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	Niedax GmbH & Co. KG, Linz am Rhein, DE	FIRES-FR-026-17-AUNE	23. 03. 2017	STN 92 0205
[2]			FIRES-FR-222-18-AUNE	11. 10. 2018	

Note: The test was carried out according previous version of test standard. Current version of test standard is: STN 92 0205: 2014/Z1: 2019. Change of the standard does not have influence on the test results summarized in the test report.

3.2 TEST RESULTS

No./ Test method	Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
[1] STN 92 0205: 2014	1	cable (N)HXCH FE 180/E90 4x50RM/25 0,6/1kV	11	82 minutes
	2	cable (N)HXCH FE 180/E90 4x50RM/25 0,6/1kV		74 minutes
	3	cable (N)HXCH FE 180/E90 4x1,5RE/1,5 0,6/1kV		53 minutes
	4	cable (N)HXCH FE 180/E90 4x1,5RE/1,5 0,6/1kV		51 minutes
	5	cable (N)HXH FE 180/E90 4x50RM 0,6/1kV	10	90 minutes no failure / interruption
	6	cable (N)HXH FE 180/E90 4x50RM 0,6/1kV		90 minutes no failure / interruption
	7	cable (N)HXH FE 180/E90 4x1,5RE 0,6/1kV		67 minutes
	8	cable (N)HXH FE 180/E90 4x1,5RE 0,6/1kV		65 minutes
	9	cable (N)HXCH FE 180/E90 4x50RM/25 0,6/1kV	14	88 minutes
	10	cable (N)HXCH FE 180/E90 4x50RM/25 0,6/1kV		85 minutes
	11	cable (N)HXCH FE 180/E90 4x1,5RE/1,5 0,6/1kV		90 minutes no failure / interruption
	12	cable (N)HXCH FE 180/E90 4x1,5RE/1,5 0,6/1kV		74 minutes
	13	cable (N)HXH FE 180/E90 4x50RM 0,6/1kV		90 minutes no failure / interruption
	14	cable (N)HXH FE 180/E90 4x50RM 0,6/1kV		41 minutes
	15	cable (N)HXH FE 180/E90 4x1,5RE 0,6/1kV		74 minutes
	16	cable (N)HXH FE 180/E90 4x1,5RE 0,6/1kV		79 minutes
	17	cable (N)HXCH FE 180/E90 4x1,5RE/1,5 0,6/1kV	9	69 minutes
	18	cable (N)HXCH FE 180/E90 4x50RM/25 0,6/1kV		73 minutes
	19	cable (N)HXCH FE 180/E90 4x50RM/25 0,6/1kV		79 minutes
	20	cable (N)HXCH FE 180/E90 4x1,5RE/1,5 0,6/1kV		69 minutes
	21	cable (N)HXH FE 180/E90 4x1,5RE 0,6/1kV	8	78 minutes
	22	cable (N)HXH FE 180/E90 4x50RM 0,6/1kV		90 minutes no failure / interruption
	23	cable (N)HXH FE 180/E90 4x50RM 0,6/1kV		90 minutes no failure / interruption
	24	cable (N)HXH FE 180/E90 4x1,5RE 0,6/1kV		90 minutes no failure / interruption
	25	cable NHXCH FE 180/E90 4x1,5RE/1,5 0,6/1kV	7	90 minutes no failure / interruption
	26	cable NHXCH FE 180/E90 4x50RM/25 0,6/1kV		90 minutes no failure / interruption
	27	cable NHXCH FE 180/E90 4x50RM/25 0,6/1kV		90 minutes no failure / interruption
	28	cable NHXCH FE 180/E90 4x1,5RE/1,5 0,6/1kV		90 minutes no failure / interruption



No./ Test method	Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
[1] STN 92 0205: 2014	29	cable (N)HXCH FE180/E90 4x1,5RE/1,5 0,6/1kV	6	90 minutes no failure / interruption
	30	cable (N)HXCH FE180/E90 4x50RM/25 0,6/1kV		90 minutes no failure / interruption
	31	cable (N)HXCH FE180/E90 4x50RM/25 0,6/1kV		90 minutes no failure / interruption
	32	cable (N)HXCH FE180/E90 4x1,5RE/1,5 0,6/1kV		90 minutes no failure / interruption
	33	cable (N)HXH FE180/E90 4x1,5RE 0,6/1kV	5	90 minutes no failure / interruption
	34	cable (N)HXH FE180/E90 4x50RM 0,6/1kV		90 minutes no failure / interruption
	35	cable (N)HXH FE180/E90 4x50RM 0,6/1kV		90 minutes no failure / interruption
	36	cable (N)HXH FE180/E90 4x1,5RE 0,6/1kV		33 minutes
	37	cable NHXCH FE180/E90 4x1,5RE/1,5 0,6/1kV	4	90 minutes no failure / interruption
	38	cable NHXCH FE180/E90 4x50RM/25 0,6/1kV		85 minutes
	39	cable NHXCH FE180/E90 4x50RM/25 0,6/1kV		88 minutes
	40	cable NHXCH FE180/E90 4x1,5RE/1,5 0,6/1kV		90 minutes no failure / interruption
	41	2 cables NHXH FE180/E90 4x1,5RE 0,6/1kV	3	90 minutes no failure / interruption
	42	2 cables NHXH FE180/E90 4x50RM 0,6/1kV		90 minutes no failure / interruption
	43	2 cables NHXCH FE180/E90 4x1,5RE/1,5 0,6/1kV	2	90 minutes no failure / interruption
	44	2 cables NHXCH FE180/E90 4x50RM/25 0,6/1kV		84 minutes
	45	2 cables NHXH FE180/E90 4x1,5RE 0,6/1kV	1	37 minutes
	46	2 cables NHXH FE180/E90 4x50RM 0,6/1kV		90 minutes no failure / interruption
	47	2 cables NHXCH FE180/E90 4x50RM/25 0,6/1kV	12	90 minutes no failure / interruption
	48	2 cables NHXCH FE180/E90 4x1,5RE/1,5 0,6/1kV		90 minutes no failure / interruption
	49	2 cables NHXH FE180/E90 4x50RM 0,6/1kV		90 minutes no failure / interruption
	50	2 cables NHXH FE180/E90 4x1,5RE 0,6/1kV		90 minutes no failure / interruption
	52	2 cables HTKSHekw 1x2x0,8 FE180 PH90/E90 225V	11	90 minutes no failure / interruption
	53	2 cables HTKSH 1x2x0,8 FE180 PH90/E90 225V	10	90 minutes no failure / interruption
	54	2 cables HTKSHekw 1x2x0,8 FE180 PH90/E90 225V	9	51 minutes
	55	2 cables HTKSH 1x2x0,8 FE180 PH90/E90 225V	8	90 minutes no failure / interruption
	56	2 cables HDGs 2x1,0 FE180 PH90/E90 300/500V	7	90 minutes no failure / interruption
	57	2 cables HDGsekwf 2x1,0 FE180 PH90/E90 300/500V		29 minutes
	58	2 cables HTKSHekw 1x2x0,8 FE180 PH90/E90 225V	6	47 minutes
	59	2 cables HTKSH 1x2x0,8 FE180 PH90/E90 225V	5	90 minutes no failure / interruption
	60	2 cables HTKSHekw 1x2x0,8 FE180 PH90/E90 225V	13	90 minutes no failure / interruption
61	2 cables HTKSH 1x2x0,8 FE180 PH90/E90 225V	90 minutes no failure / interruption		
62	2 cables HDGsekwf 2x1,0 FE180 PH90/E90 300/500V	90 minutes no failure / interruption		
63	2 cables HDGs 2x1,0 FE180 PH90/E90 300/500V	87 minutes		
64	2 cables HDGsekwf 2x1,0 FE180 PH90/E90 300/500V	4	90 minutes no failure / interruption	
65	2 cables HDGs 2x1,0 FE180 PH90/E90 300/500V	3	90 minutes no failure / interruption	
66	2 cables HDGsekwf 2x1,0 FE180 PH90/E90 300/500V	2	90 minutes no failure / interruption	
67	2 cables HDGs 2x1,0 FE180 PH90/E90 300/500V	1	90 minutes no failure / interruption	
[2] STN 92 0205: 2014	1	2 cables BiTflame® 1000C FE180/PH90/E90 4x1,5RE/1,5 0,6/1kV	14	90 minutes no failure / interruption
	2	2 cables BiTflame® 1000C FE180/PH90/E90 4x50RM/25 0,6/1kV		90 minutes no failure / interruption
	3	2 cables BiTflame® 1000C FE180/PH90/E90 4x1,5RE/1,5 0,6/1kV	13	90 minutes no failure / interruption
	4	2 cables BiTflame® 1000C FE180/PH90/E90 4x50RM/25 0,6/1kV		90 minutes no failure / interruption
	5	2 cables BiTflame® 1000 FE180/PH90/E90 4x1,5RE 0,6/1kV	12	90 minutes no failure / interruption
	6	2 cables BiTflame® 1000 FE180/PH90/E90 4x50RM 0,6/1kV		90 minutes no failure / interruption



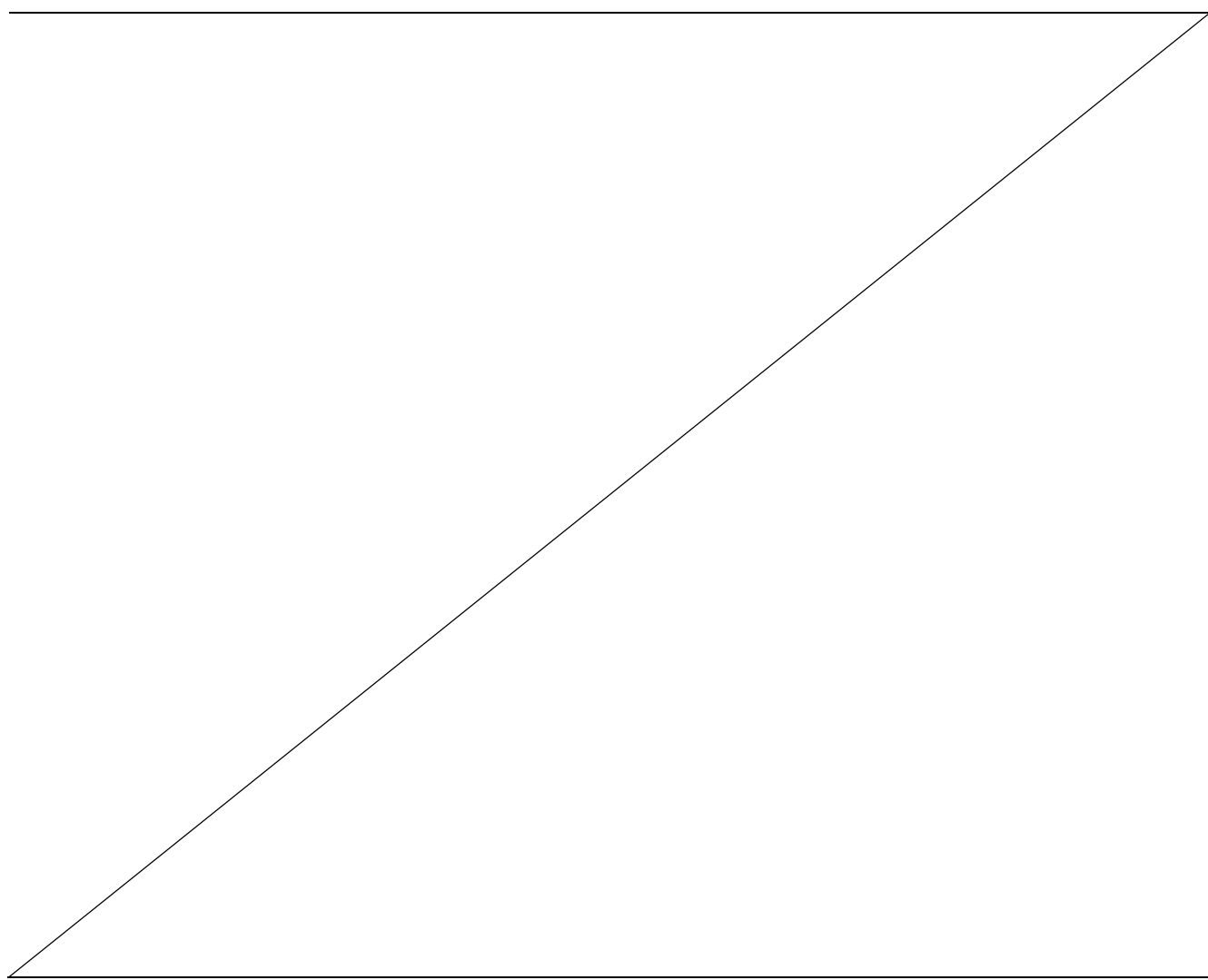
No./ Test method	Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor	
[2] STN 92 0205: 2014	7	2 cables BiTflame® 1000 FE180/PH90/E90 4x1,5RE 0,6/1kV	11	58 minutes	
	8	2 cables BiTflame® 1000 FE180/PH90/E90 4x50RM 0,6/1kV		90 minutes no failure / interruption	
	9	2 cables BiTflame® 1000C FE180/PH90/E90 4x1,5RE/1,5 0,6/1kV	10	90 minutes no failure / interruption	
	10	2 cables BiTflame® 1000C FE180/PH90/E90 4x50RM/25 0,6/1kV		90 minutes no failure / interruption	
	11	2 cables BiTflame® 1000 FE180/PH90/E90 4x1,5RE 0,6/1kV	9	90 minutes no failure / interruption	
	12	2 cables BiTflame® 1000 FE180/PH90/E90 4x50RM 0,6/1kV		90 minutes no failure / interruption	
	13	2 cables BiTflame® 1000C FE180/PH90/E90 4x1,5RE/1,5 0,6/1kV	8	90 minutes no failure / interruption	
	14	2 cables BiTflame® 1000C FE180/PH90/E90 4x50RM/25 0,6/1kV		90 minutes no failure / interruption	
	15	2 cables BiTflame® 1000 FE180/PH90/E90 4x1,5RE 0,6/1kV	7	90 minutes no failure / interruption	
	16	2 cables BiTflame® 1000 FE180/PH90/E90 4x50RM 0,6/1kV		90 minutes no failure / interruption	
	17	2 cables BiTflame® 1000C FE180/PH90/E90 4x1,5RE/1,5 0,6/1kV	6	77 minutes	
	18	2 cables BiTflame® 1000C FE180/PH90/E90 4x50RM/25 0,6/1kV		90 minutes no failure / interruption	
	19	2 cables BiTflame® 1000C FE180/PH90/E90 4x1,5RE/1,5 0,6/1kV	5	90 minutes no failure / interruption	
	20	2 cables BiTflame® 1000C FE180/PH90/E90 4x50RM/25 0,6/1kV		64 minutes	
	21	2 cables BiTflame® 1000 FE180/PH90/E90 4x1,5RE 0,6/1kV	4	90 minutes no failure / interruption	
	22	2 cables BiTflame® 1000 FE180/PH90/E90 4x50RM 0,6/1kV		90 minutes no failure / interruption	
	23	2 cables BiTflame® 1000C FE180/PH90/E90 4x1,5RE/1,5 0,6/1kV	16	90 minutes no failure / interruption	
	24	2 cables BiTflame® 1000C FE180/PH90/E90 4x50RM/25 0,6/1kV		90 minutes no failure / interruption	
	25	2 cables BiTflame® 1000 FE180/PH90/E90 4x1,5RE 0,6/1kV		90 minutes no failure / interruption	
	26	2 cables BiTflame® 1000 FE180/PH90/E90 4x50RM 0,6/1kV		90 minutes no failure / interruption	
	27	2 cables BiTflame® 1000 FE180/PH90/E90 4x1,5RE 0,6/1kV	3	53 minutes	
	28	2 cables BiTflame® 1000 FE180/PH90/E90 4x50RM 0,6/1kV		90 minutes no failure / interruption	
	29	2 cables BiTflame® 1000C FE180/PH90/E90 4x1,5RE/1,5 0,6/1kV	2	90 minutes no failure / interruption	
	30	2 cables BiTflame® 1000C FE180/PH90/E90 4x50RM/25 0,6/1kV		90 minutes no failure / interruption	
	31	2 cables BiTflame® 1000 FE180/PH90/E90 4x1,5RE 0,6/1kV	1	90 minutes no failure / interruption	
	32	2 cables BiTflame® 1000 FE180/PH90/E90 4x50RM 0,6/1kV		90 minutes no failure / interruption	
	33	2 cables BiTflame® 1000C FE180/PH90/E90 4x50RM/25 0,6/1kV	15	90 minutes no failure / interruption	
	34	2 cables BiTflame® 1000C FE180/PH90/E90 4x1,5RE/1,5 0,6/1kV		90 minutes no failure / interruption	
	35	2 cables BiTflame® 1000 FE180/PH90/E90 4x50RM 0,6/1kV		90 minutes no failure / interruption	
	36	2 cables BiTflame® 1000 FE180/PH90/E90 4x1,5RE 0,6/1kV		90 minutes no failure / interruption	
	52	A	2 cables HTKSHekw 1x2x0,8 FE180/PH90/E90 225V	14	90 minutes no failure / interruption
		B	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V		90 minutes no failure / interruption
	53	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V	13	90 minutes no failure / interruption	
	54	2 cables HTKSHekw 1x2x0,8 FE180/PH90/E90 225V		90 minutes no failure / interruption	
	55	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V	12	84 minutes	
	56	2 cables HDGsekwf 2x1,0 FE180/PH90/E90 300/500V		90 minutes no failure / interruption	
57	2 cables HDGsekwf 2x1,0 FE180/PH90/E90 300/500V	11	90 minutes no failure / interruption		
58	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V		90 minutes no failure / interruption		
59	2 cables HTKSHekw 1x2x0,8 FE180/PH90/E90 225V	10	90 minutes no failure / interruption		
60	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V	9	90 minutes no failure / interruption		
61	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V	8	90 minutes no failure / interruption		
62	2 cables HTKSHekw 1x2x0,8 FE180/PH90/E90 225V		90 minutes no failure / interruption		
63	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V	7	41 minutes		
64	2 cables HDGsekwf 2x1,0 FE180/PH90/E90 300/500V		90 minutes no failure / interruption		



No./ Test method	Specimen No.		Cables	Track No.	Time to first failure / interruption of conductor
[2] STN 92 0205: 2014	65	A	2 cables HTKSHekw 1x2x0,8 FE180/PH90/E90 225V	16	90 minutes no failure / interruption
		B	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V		90 minutes no failure / interruption
	66	A	2 cables HDGsekwf 2x1,0 FE180/PH90/E90 300/500V		90 minutes no failure / interruption
		B	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V		90 minutes no failure / interruption
	67		2 cables HTKSHekw 1x2x0,8 FE180/PH90/E90 225V	6	55 minutes
	68		2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V		46 minutes
	69		2 cables HTKSHekw 1x2x0,8 FE180/PH90/E90 225V	5	90 minutes no failure / interruption
	70		2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V		60 minutes
	71		2 cables HDGsekwf 2x1,0 FE180/PH90/E90 300/500V	4	90 minutes no failure / interruption
	72		2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V	3	33 minutes
	73		2 cables HDGsekwf 2x1,0 FE180/PH90/E90 300/500V		74 minutes
	74		2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V	1	50 minutes
	75		2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V	15	90 minutes no failure / interruption

[1], [2] The tests were discontinued in 94th minute upon request of the test sponsor

Specimens S1 – S51 were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W.
 Specimens S52 – S75 were tested by one-phase voltage supply 1 x 110V with LED diodes 3V /0,03W.
 Circuit breakers with rating 3 A were used.





4. CLASSIFICATION AND FIELD OF APPLICATION

4.1 CLASSIFICATION ACCORDING TO ČSN 73 0895: 2016

The element, **Cable supporting system NIEDAX with halogen-free power and communication cables Bitner**, is classified according to the following combinations of performance parameters and classes as appropriate.

Cable	Type of tested cable, single cross-sections and number of conductors	Arrangement	Classification for type of tested cable (by cross-sections)	Classification for cable
NHXH FE180/E90 0,6/1kV	NHXH FE180/E90 4x1,5RE 0,6/1kV [1]	Cable mesh tray MTC 54.400. Consoles HU 5050, brackets KTA 400 and spacer HDS 5050. Consoles in spacing of 1500 mm. Maximum loading 15kg.m ⁻¹ . Suspended installation. Non-standard tracks: No. 1, 2 and 10, 11 [1]. No. 1 and 2 [2].	P30-R	n x ≥1,5 mm ² n ≥ 1
	NHXH FE180/E90 4x50RM 0,6/1kV [1]		P90-R	P30-R
NHXCH FE180/E90 0,6/1kV	NHXCH FE180/E90 4x1,5RE/1,5 0,6/1kV [1]		P90-R	n x ≥1,5 mm ² n ≥ 1
	NHXCH FE180/E90 4x50RM/25 0,6/1kV [1]		P60-R	P60-R
(N)HXH FE180/E90 0,6/1kV	(N)HXH FE180/E90 4x1,5RE 0,6/1kV [1]		P60-R	n x ≥1,5 mm ² n ≥ 1
	(N)HXH FE180/E90 4x50RM 0,6/1kV [1]		P90-R	P60-R
(N)HXCH FE180/E90 0,6/1kV	(N)HXCH FE180/E90 4x1,5RE/1,5 0,6/1kV [1]		P45-R	n x ≥1,5 mm ² n ≥ 1
	(N)HXCH FE180/E90 4x50RM/25 0,6/1kV [1]		P60-R	P45-R
BiTflame® 1000 FE180/PH90 E90 0,6/1kV	BiTflame® 1000 FE180/PH90/E90 4x1,5RE 0,6/1kV [2]		P90-R	n x ≥1,5 mm ² n ≥ 1
	BiTflame® 1000 FE180/PH90/E90 4x50RM 0,6/1kV [2]		P90-R	P90-R
BiTflame® 1000 C FE180/PH90 E90 0,6/1kV	BiTflame® 1000C FE180/PH90/E90 4x1,5RE/1,5 0,6/1kV [2]		P90-R	n x ≥1,5 mm ² n ≥ 1
	BiTflame® 1000C FE180/PH90/E90 4x50RM/25 0,6/1kV [2]		P90-R	P90-R
HDGs FE180 PH90/E90 300/500V	HDGs 2x1,0 FE180 PH90/E90 300/500V [1]		P90-R	n x ≥1,0 mm ² n ≥ 2 P90-R
HDGsekwf FE180 PH90/E90 300/500V	HDGsekwf 2x1,0 FE180 PH90/E90 300/500V [1]		P90-R	n x ≥1,0 mm ² n ≥ 2 P90-R
HTKSH FE180 PH90/E90 225V	HTKSH 1x2x0,8 FE180 PH90/E90 225V [1]		P90-R	n x 2 x ≥0,8 mm n ≥ 1 P90-R
HTKSHekw FE180 PH90/E90 225V	HTKSHekw 1x2x0,8 FE180 PH90/E90 225V [1]		P90-R	n x 2 x ≥0,8 mm n ≥ 1 P90-R



Cable	Type of tested cable, single cross-sections and number of conductors	Arrangement	Classification for type of tested cable (by cross-sections)	Classification for cable	
NHXH FE180/E90 0,6/1kV	NHXH FE180/E90 4x1,5RE 0,6/1kV [1]	Cable mesh tray MTC 54.400. Consoles combined of C-profile 2986 and threaded rods M10. Consoles suspended to supporting construction ¹⁾ by trapezoidal hangers DBT40 and threaded rods M8. Consoles in spacing of 1500 mm. Maximum loading 15kg.m ⁻¹ . Suspended installation. Non-standard tracks: No. 3, 4 and 8, 9 [1]	P90-R	n x ≥1,5 mm ² n ≥ 1	
	NHXH FE180/E90 4x50RM 0,6/1kV [1]		P90-R	P90-R	
NHXCH FE180/E90 0,6/1kV	NHXCH FE180/E90 4x1,5RE/1,5 0,6/1kV [1]		P90-R	n x ≥1,5 mm ² n ≥ 1	
	NHXCH FE180/E90 4x50RM/25 0,6/1kV [1]		P60-R	P60-R	
(N)HXH FE180/E90 0,6/1kV	(N)HXH FE180/E90 4x1,5RE 0,6/1kV [1]		P60-R	n x ≥1,5 mm ² n ≥ 1	
	(N)HXH FE180/E90 4x50RM 0,6/1kV [1]		P90-R	P60-R	
(N)HXCH FE180/E90 0,6/1kV	(N)HXCH FE180/E90 4x1,5RE/1,5 0,6/1kV [1]		P60-R	n x ≥1,5 mm ² n ≥ 1	
	(N)HXCH FE180/E90 4x50RM/25 0,6/1kV [1]		P60-R	P60-R	
HDGs FE180 PH90/E90 300/500V	HDGs 2x1,0 FE180 PH90/E90 300/500V [1]		P90-R	n x ≥1,0 mm ² n ≥ 2	
HDGsekwf FE180 PH90/E90 300/500V	HDGsekwf 2x1,0 FE180 PH90/E90 300/500V [1]		P90-R	n x ≥1,0 mm ² n ≥ 2	
HTKSH FE180 PH90/E90 225V	HTKSH 1x2x0,8 FE180 PH90/E90 225V [1]		P90-R	n x 2 x ≥0,8 mm n ≥ 1	
HTKSHekw FE180 PH90/E90 225V	HTKSHekw 1x2x0,8 FE180 PH90/E90 225V [1]		P45-R	n x 2 x ≥0,8 mm n ≥ 1	
NHXCH FE180/E90 0,6/1kV	NHXCH FE180/E90 4x1,5RE/1,5 0,6/1kV [1]		Cable ladder STL 60.403. Consoles HU 5050, bracket KTAG 400, spacers HDS 5050, threaded rod M12 and suspension hanger DBG 12. Consoles in spacing of 1500 mm. Maximum loading 20kg.m ⁻¹ . Suspended installation. Non-standard tracks: No. 5 – 7 [1]	P90-R	n x ≥1,5 mm ² n ≥ 1
	NHXCH FE180/E90 4x50RM/25 0,6/1kV [1]			P90-R	P90-R
(N)HXH FE180/E90 0,6/1kV	(N)HXH FE180/E90 4x1,5RE 0,6/1kV [1]	P30-R		n x ≥1,5 mm ² n ≥ 1	
	(N)HXH FE180/E90 4x50RM 0,6/1kV [1]	P90-R		P30-R	
(N)HXCH FE180/E90 0,6/1kV	(N)HXCH FE180/E90 4x1,5RE/1,5 0,6/1kV [1]	P90-R		n x ≥1,5 mm ² n ≥ 1	
	(N)HXCH FE180/E90 4x50RM/25 0,6/1kV [1]	P90-R		P90-R	
HDGs FE180 PH90/E90 300/500V	HDGs 2x1,0 FE180 PH90/E90 300/500V [1]	P90-R		n x ≥1,0 mm ² n ≥ 2	
HDGsekwf FE180 PH90/E90 300/500V	HDGsekwf 2x1,0 FE180 PH90/E90 300/500V [1]	P15-R		n x ≥1,0 mm ² n ≥ 2	
HTKSH FE180 PH90/E90 225V	HTKSH 1x2x0,8 FE180 PH90/E90 225V [1]	P90-R		n x 2 x ≥0,8 mm n ≥ 1	
HTKSHekw FE180 PH90/E90 225V	HTKSHekw 1x2x0,8 FE180 PH90/E90 225V [1]	P45-R		n x 2 x ≥0,8 mm n ≥ 1	

¹⁾ Supporting construction is made of segments of steel sheets 1,2 mm thick bent to wave 550 mm long. Individual segments are fixed to ceiling by 4 pcs of anchors in spacing of 1500 mm.



Cable	Type of tested cable, single cross-sections and number of conductors	Arrangement	Classification for type of tested cable (by cross-sections)	Classification for cable	
BiTflame® 1000 FE180/PH90 E90 0,6/1kV	BiTflame® 1000 FE180/PH90/E90 4x1,5RE 0,6/1kV [2]	Cable tray RL 110.400. Consoles HU 5050, brackets KTA 600, spacer HDS 5050, threaded fixing device RGAB (fixed to outside edge of cable tray) and threaded rod M10. Consoles in spacing of 1500 mm. Maximum loading 20kg.m ⁻¹ . Suspended installation. Non-standard track: No. 3 [2]	P45-R	n x ≥1,5 mm ² n ≥ 1	
	BiTflame® 1000 FE180/PH90/E90 4x50RM 0,6/1kV [2]		P90-R	P45-R	
HDGs FE180 PH90/E90 300/500V	HDGs 2x1,0 FE180 PH90/E90 300/500V [2]		P30-R	n x ≥1,0 mm ² n ≥ 2 P30-R	
HDGsekwf FE180 PH90/E90 300/500V	HDGsekwf 2x1,0 FE180 PH90/E90 300/500V [2]		P60-R	n x ≥1,0 mm ² n ≥ 2 P60-R	
BiTflame® 1000 FE180/PH90 E90 0,6/1kV	BiTflame® 1000 FE180/PH90/E90 4x1,5RE 0,6/1kV [2]	Cable ladder STL 60.403. Consoles HU 5050, bracket KTAG 400, spacers HDS 5050, threaded rod M10. Consoles in spacing of 1500 mm. Maximum loading 20kg.m ⁻¹ . Suspended installation. Non-standard tracks: No. 4 – 5 [2]	P90-R	n x ≥1,5 mm ² n ≥ 1	
	BiTflame® 1000 FE180/PH90/E90 4x50RM 0,6/1kV [2]		P90-R	P90-R	
BiTflame® 1000 C FE180/PH90 E90 0,6/1kV	BiTflame® 1000C FE180/PH90/E90 4x1,5RE/1,5 0,6/1kV [2]		P90-R	n x ≥1,5 mm ² n ≥ 1	
	BiTflame® 1000C FE180/PH90/E90 4x50RM/25 0,6/1kV [2]		P60-R	P60-R	
HDGs FE180 PH90/E90 300/500V	HDGs 2x1,0 FE180 PH90/E90 300/500V [2]		P60-R	n x ≥1,0 mm ² n ≥ 1 P60-R	
HDGsekwf FE180 PH90/E90 300/500V	HDGsekwf 2x1,0 FE180 PH90/E90 300/500V [2]		P90-R	n x ≥1,0 mm ² n ≥ 1 P90-R	
HTKSHekw FE180 PH90/E90 225V	HTKSHekw 1x2x0,8 FE180 PH90/E90 225V [2]		P90-R	n x 2 x ≥0,8 mm n ≥ 1 P90-R	
BiTflame® 1000 C FE180/PH90 E90 0,6/1kV	BiTflame® 1000C FE180/PH90/E90 4x1,5RE/1,5 0,6/1kV [2]		Cable tray RL 110.400. Consoles HU 5050, bracket KTAG 400, spacers HDS 5050, threaded rod M10. Consoles in spacing of 1500 mm. Maximum loading 20kg.m ⁻¹ . Suspended installation. Non-standard track: No. 6 [2]	P60-R	n x ≥1,5 mm ² n ≥ 1
	BiTflame® 1000C FE180/PH90/E90 4x50RM/25 0,6/1kV [2]			P90-R	P60-R
HTKSH FE180 PH90/E90 225V	HTKSH 1x2x0,8 FE180 PH90/E90 225V [2]			P45-R	n x 2 x ≥0,8 mm n ≥ 1 P45-R
HTKSHekw FE180 PH90/E90 225V	HTKSHekw 1x2x0,8 FE180 PH90/E90 225V [2]	P45-R		n x 2 x ≥0,8 mm n ≥ 1 P45-R	
BiTflame® 1000 FE180/PH90 E90 0,6/1kV	BiTflame® 1000 FE180/PH90/E90 4x1,5RE 0,6/1kV [2]	Cable tray RLVC 60.300. Consoles TAH-D 300/500. Consoles in spacing of 1500 mm. Maximum loading 15kg.m ⁻¹ . Suspended installation. Non-standard track: No. 7 [2]		P90-R	n x ≥1,5 mm ² n ≥ 1
	BiTflame® 1000 FE180/PH90/E90 4x50RM 0,6/1kV [2]			P90-R	P90-R
HDGs FE180 PH90/E90 300/500V	HDGs 2x1,0 FE180 PH90/E90 300/500V [2]			P30-R	n x ≥1,0 mm ² n ≥ 2 P30-R
HDGsekwf FE180 PH90/E90 300/500V	HDGsekwf 2x1,0 FE180 PH90/E90 300/500V [2]			P90-R	n x ≥1,0 mm ² n ≥ 2 P90-R



Cable	Type of tested cable, single cross-sections and number of conductors	Arrangement	Classification for type of tested cable (by cross-sections)	Classification for cable	
BiTflame® 1000 C FE180/PH90 E90 0,6/1kV	BiTflame® 1000C FE180/PH90/E90 4x1,5RE/1,5 0,6/1kV [2]	Cable tray RLVC 60.300. Consoles TAH-D 300/500. Consoles in spacing of 1500 mm. Maximum loading 15kg.m ⁻¹ . Suspended installation. Non-standard track: No. 8 [2]	P90-R	n x ≥1,5 mm ² n ≥ 1	
	BiTflame® 1000C FE180/PH90/E90 4x50RM/25 0,6/1kV [2]		P90-R	P90-R	
HTKSH FE180 PH90/E90 225V	HTKSH 1x2x0,8 FE180 PH90/E90 225V [2]		P90-R	n x 2 x ≥0,8 mm n ≥ 1 P90-R	
HTKSHekw FE180 PH90/E90 225V	HTKSHekw 1x2x0,8 FE180 PH90/E90 225V [2]		P90-R	n x 2 x ≥0,8 mm n ≥ 1 P90-R	
BiTflame® 1000 FE180/PH90 E90 0,6/1kV	BiTflame® 1000 FE180/PH90/E90 4x1,5RE 0,6/1kV [2]		Cable mesh tray MTC 54.400. Consoles combined of C-profile 2987 and threaded rods M10. Consoles suspended to supporting construction ¹⁾ by trapezoidal hangers DBT40 and threaded rods M8. Consoles in spacing of 1500 mm. Maximum loading 15kg.m ⁻¹ . Suspended installation. Non-standard tracks: No. 9 and 10 [2]	P90-R	n x ≥1,5 mm ² n ≥ 1
	BiTflame® 1000 FE180/PH90/E90 4x50RM 0,6/1kV [2]			P90-R	P90-R
BiTflame® 1000 C FE180/PH90 E90 0,6/1kV	BiTflame® 1000C FE180/PH90/E90 4x1,5RE/1,5 0,6/1kV [2]	P90-R		n x ≥1,5 mm ² n ≥ 1	
	BiTflame® 1000C FE180/PH90/E90 4x50RM/25 0,6/1kV [2]	P90-R		P90-R	
HDGs FE180 PH90/E90 300/500V	HDGs 2x1,0 FE180 PH90/E90 300/500V [2]	P90-R		n x ≥1,0 mm ² n ≥ 2 P90-R	
HTKSHekw FE180 PH90/E90 225V	HTKSHekw 1x2x0,8 FE180 PH90/E90 225V [2]	P90-R		n x 2 x ≥0,8 mm n ≥ 1 P90-R	
BiTflame® 1000 FE180/PH90 E90 0,6/1kV	BiTflame® 1000 FE180/PH90/E90 4x1,5RE 0,6/1kV [2]	P90-R		n x ≥1,5 mm ² n ≥ 1	
	BiTflame® 1000 FE180/PH90/E90 4x50RM 0,6/1kV [2]	P90-R		P90-R	
BiTflame® 1000 C FE180/PH90 E90 0,6/1kV	BiTflame® 1000C FE180/PH90/E90 4x1,5RE/1,5 0,6/1kV [2]	Cable tray RLVC 60.400. Consoles combined of C-profile 2987 and threaded rods M10. Consoles suspended to supporting construction ¹⁾ by trapezoidal hangers DBT40 and threaded rods M8. Consoles in spacing of 1500 mm. Maximum loading 20kg.m ⁻¹ . Suspended installation. Non-standard tracks: No. 12 and 13 [2]		P90-R	n x ≥1,5 mm ² n ≥ 1
	BiTflame® 1000C FE180/PH90/E90 4x50RM/25 0,6/1kV [2]			P90-R	P90-R
HDGs FE180 PH90/E90 300/500V	HDGs 2x1,0 FE180 PH90/E90 300/500V [2]		P60-R	n x ≥1,0 mm ² n ≥ 2 P60-R	
HDGsekwf FE180 PH90/E90 300/500V	HDGsekwf 2x1,0 FE180 PH90/E90 300/500V [2]		P90-R	n x ≥1,0 mm ² n ≥ 2 P90-R	
HTKSH FE180 PH90/E90 225V	HTKSH 1x2x0,8 FE180 PH90/E90 225V [2]		P90-R	n x 2 x ≥0,8 mm n ≥ 1 P90-R	
HTKSHekw FE180 PH90/E90 225V	HTKSHekw 1x2x0,8 FE180 PH90/E90 225V [2]		P90-R	n x 2 x ≥0,8 mm n ≥ 1 P90-R	

1) Supporting construction is made of segments of steel sheets 1,2 mm thick bent to wave 550 mm long. Individual segments are fixed to ceiling by 4 pcs of anchors in spacing of 1500 mm.



Cable	Type of tested cable, single cross-sections and number of conductors	Arrangement	Classification for type of tested cable (by cross-sections)	Classification for cable	
BiTflame® 1000 FE180/PH90 E90 0,6/1kV	BiTflame® 1000 FE180/PH90/E90 4x1,5RE 0,6/1kV [2]	Cable tray RL 110.400. Consoles combined of C-profile 2987 and threaded rods M10. Consoles in spacing of 1500 mm. Maximum loading 20kg.m ⁻¹ . Suspended installation. Non-standard tracks: No. 11 and 13 [2]	P45-R	n x ≥ 1,5 mm ² n ≥ 1	
	BiTflame® 1000 FE180/PH90/E90 4x50RM 0,6/1kV [2]		P90-R	P45-R	
BiTflame® 1000 C FE180/PH90 E90 0,6/1kV	BiTflame® 1000C FE180/PH90/E90 4x1,5RE/1,5 0,6/1kV [2]		P90-R	n x ≥ 1,5 mm ² n ≥ 1	
	BiTflame® 1000C FE180/PH90/E90 4x50RM/25 0,6/1kV [2]		P90-R	P90-R	
HDGs FE180 PH90/E90 300/500V	HDGs 2x1,0 FE180 PH90/E90 300/500V [2]		P90-R	n x ≥ 1,0 mm ² n ≥ 2	
HDGsekwf FE180 PH90/E90 300/500V	HDGsekwf 2x1,0 FE180 PH90/E90 300/500V [2]		P90-R	n x ≥ 1,0 mm ² n ≥ 2	
HTKSH FE180 PH90/E90 225V	HTKSH 1x2x0,8 FE180 PH90/E90 225V [2]		P90-R	n x 2 x ≥ 0,8 mm n ≥ 1	
HTKSHekw FE180 PH90/E90 225V	HTKSHekw 1x2x0,8 FE180 PH90/E90 225V [2]		P90-R	n x 2 x ≥ 0,8 mm n ≥ 1	
NHXH FE180/E90 0,6/1kV	NHXH FE180/E90 4x1,5RE 0,6/1kV [1]		Track is made of C-profiles 2970 fixed to ceiling in spacing of 600 mm. Cables are fixed to profiles by cable yoke clamps type "B". Non-standard tracks: No. 12 – 14 [1]	P90-R	n x ≥ 1,5 mm ² n ≥ 1
	NHXH FE180/E90 4x50RM 0,6/1kV [1]			P90-R	P90-R
NHXCH FE180/E90 0,6/1kV	NHXCH FE180/E90 4x1,5RE/1,5 0,6/1kV [1]	P90-R		n x ≥ 1,5 mm ² n ≥ 1	
	NHXCH FE180/E90 4x50RM/25 0,6/1kV [1]	P90-R		P90-R	
(N)HXH FE180/E90 0,6/1kV	(N)HXH FE180/E90 4x1,5RE 0,6/1kV [1]	P60-R		n x ≥ 1,5 mm ² n ≥ 1	
	(N)HXH FE180/E90 4x50RM 0,6/1kV [1]	P30-R		P30-R	
(N)HXCH FE180/E90 0,6/1kV	(N)HXCH FE180/E90 4x1,5RE/1,5 0,6/1kV [1]	P60-R		n x ≥ 1,5 mm ² n ≥ 1	
	(N)HXCH FE180/E90 4x50RM/25 0,6/1kV [1]	P60-R		P60-R	
HDGsekwf FE180 PH90/E90 300/500V	HDGsekwf 2x1,0 FE180 PH90/E90 300/500V [1]	P90-R		n x ≥ 1,0 mm ² n ≥ 2	
HTKSH FE180 PH90/E90 225V	HTKSH 1x2x0,8 FE180 PH90/E90 225V [1]	P90-R		n x 2 x ≥ 0,8 mm n ≥ 1	
HTKSHekw FE180 PH90/E90 225V	HTKSHekw 1x2x0,8 FE180 PH90/E90 225V [1]	P90-R		n x 2 x ≥ 0,8 mm n ≥ 1	



Cable	Type of tested cable, single cross-sections and number of conductors	Arrangement	Classification for type of tested cable (by cross-sections)	Classification for cable	
BiTflame® 1000 FE180/PH90 E90 0,6/1kV	BiTflame® 1000 FE180/PH90/E90 4x1,5RE 0,6/1kV [2]	Track is made of C-profiles 2970 fixed to ceiling in spacing of 600 mm. Cables are fixed to profiles by cable yoke clamps type "B". Non-standard track: No. 15 [2]	P90-R	$n \times \geq 1,5 \text{ mm}^2$ $n \geq 1$	
	BiTflame® 1000 FE180/PH90/E90 4x50RM 0,6/1kV [2]		P90-R	P90-R	
BiTflame® 1000 C FE180/PH90 E90 0,6/1kV	BiTflame® 1000C FE180/PH90/E90 4x1,5RE/1,5 0,6/1kV [2]		P90-R	$n \times \geq 1,5 \text{ mm}^2$ $n \geq 1$	
	BiTflame® 1000C FE180/PH90/E90 4x50RM/25 0,6/1kV [2]		P90-R	P90-R	
HDGs FE180 PH90/E90 300/500V	HDGs 2x1,0 FE180 PH90/E90 300/500V [2]		P90-R	$n \times \geq 1,0 \text{ mm}^2$ $n \geq 2$	
BiTflame® 1000 FE180/PH90 E90 0,6/1kV	BiTflame® 1000 FE180/PH90/E90 4x1,5RE 0,6/1kV [2]		Track is made of C-profiles 2970 fixed to ceiling in spacing of 600 mm. Cables are fixed to profiles by cable clips SAS. Non-standard track: No. 16 [2]	P90-R	$n \times \geq 1,5 \text{ mm}^2$ $n \geq 1$
	BiTflame® 1000 FE180/PH90/E90 4x50RM 0,6/1kV [2]			P90-R	P90-R
BiTflame® 1000 C FE180/PH90 E90 0,6/1kV	BiTflame® 1000C FE180/PH90/E90 4x1,5RE/1,5 0,6/1kV [2]			P90-R	$n \times \geq 1,5 \text{ mm}^2$ $n \geq 1$
	BiTflame® 1000C FE180/PH90/E90 4x50RM/25 0,6/1kV [2]	P90-R		P90-R	
HDGs FE180 PH90/E90 300/500V	HDGs 2x1,0 FE180 PH90/E90 300/500V [2]	P90-R		$n \times \geq 1,0 \text{ mm}^2$ $n \geq 2$	
HDGsekwf FE180 PH90/E90 300/500V	HDGsekwf 2x1,0 FE180 PH90/E90 300/500V [2]	P90-R		$n \times \geq 1,0 \text{ mm}^2$ $n \geq 2$	
HTKSH FE180 PH90/E90 225V	HTKSH 1x2x0,8 FE180 PH90/E90 225V [2]	P90-R		$n \times 2 \times \geq 0,8 \text{ mm}$ $n \geq 1$	
HTKSHekw FE180 PH90/E90 225V	HTKSHekw 1x2x0,8 FE180 PH90/E90 225V [2]	P90-R		$n \times 2 \times \geq 0,8 \text{ mm}$ $n \geq 1$	

The element, **Cable supporting system NIEDAX with power and communication halogen-free cables Bitner** with circuit integrity maintenance classes are classified to classes according to achieved test results of tested cables at tracks. Other classification is not allowed.

4.2 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 test results to be directly applied in practice is that the support and fixing structure is attached to a building construction which is sufficient in term of its statics performance for required period of circuit integrity, i.e. the element meets the criterion R according to EN 13501-2+A1;
- 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;
 - in case of both standard and non-standard support structures in according to 7.2 and 7.4 of STN 92 0205 the installation may be realized by another way under conditions given in Annex C of STN 92 0205;

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 EN 61537 are not considered to be standard support structures. In case of test specimens of support structures made according to 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 according to Figure 6 of STN 92 0205;
- 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 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 EN 13501 + A1; 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 EN 13501-1 + A1 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 Figure 5a of STN 92 0205);



- in case of effective method of fixing according to Figure 5a) the metal cable clips used are tested in standard support structures which are protected (spacing between protected clips is $\leq 3\,500$ mm) by fire cladding against direct effect of heat exposition. The cladding shall meet integrity criterion E and insulation criterion I according to EN 13501-2 + A1 at least for period equal to required period of cable system circuit integrity;
- 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 EN 13501-2 + A1 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;
- suitability of any other effective fixing design shall be assessed by an accredited testing laboratory;
- 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 1101-1: 2013. 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;
- in case of testing of several test specimens of the same cable system type within one test, the full classification of specified cable product type is achievable if at least 84 % of total number of identical cable test specimens in the same cable system type passes the test successfully. Remaining 16 % of test cable specimens shall be functional at least for 80 % of circuit integrity period achieved by successfully tested specimens;
- 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;
- test results from test with a test specimen of optic cable are directly applicable to all constructions of specified type that have the same or greater number of optic fibres than that used in the cable test specimen;
- classification of cable system circuit integrity without carrying the tests according to 4.4.2 of STN 92 0205 is possible in case of cable products meeting only requirements of specific fire resistance according to 2.10 of STN 92 0205 which are intended for standard support constructions tested following this standard. The period of circuit integrity of this cable system is max of 15 minutes;

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 assessed by an approved testing laboratory;



4.3 FIELD OF EXTENDED APPLICATION

Cable products

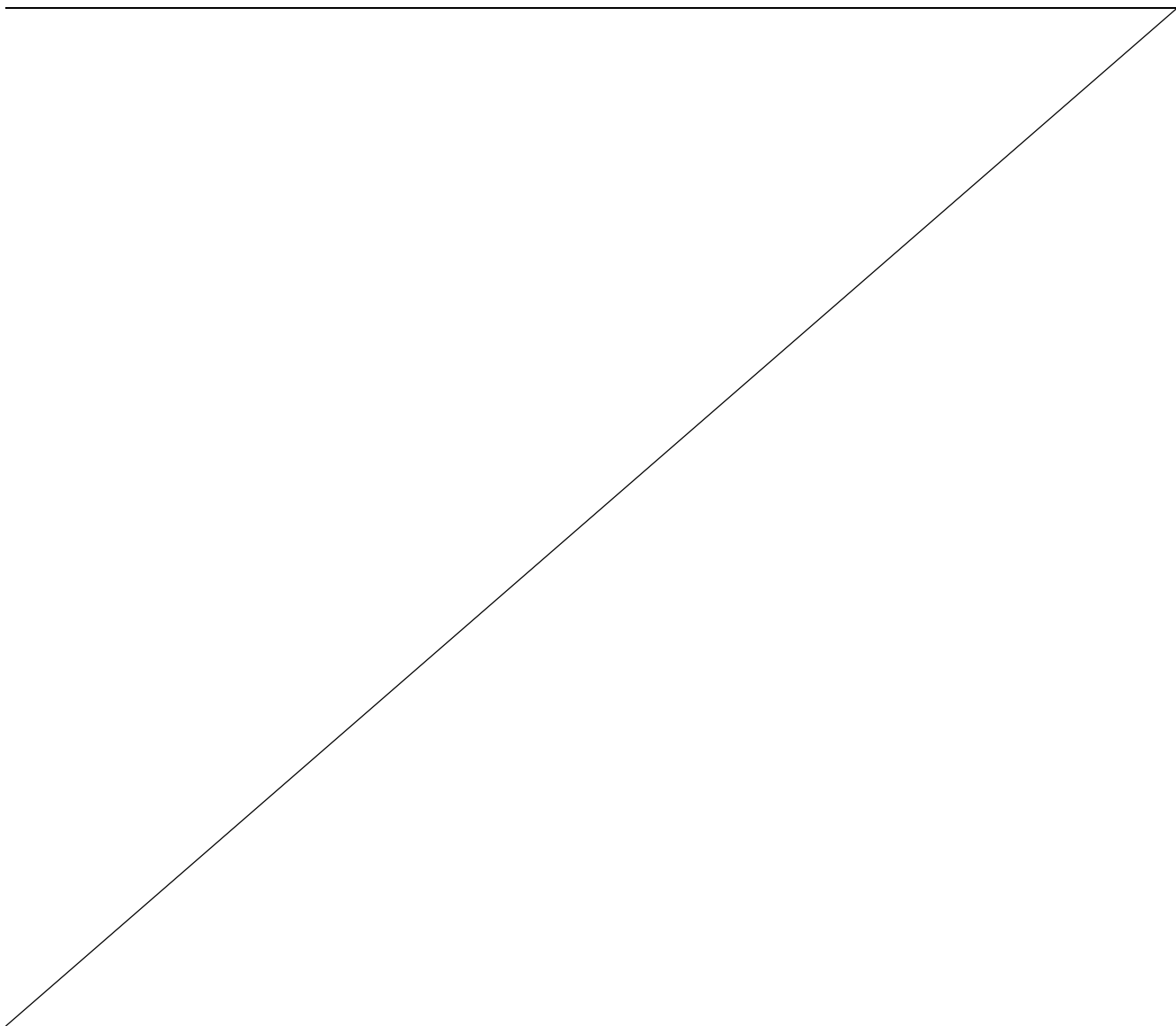
- based on the test results of cable supporting systems with cable trays or ladders it is allowed to apply direct application acc. to clause 7 of STN 92 0205 also for using of cables, which are not used to permanent electric power distribution if these cables are laid at separate cable tray or ladder on same consoles or in same cable tray or ladder with cables with circuit integrity in fire, whereupon the cables shall be physically separated on whole length by partition;
- maximum allowed loading of constructions shall be observed. Cable tray or ladder with cables which are not used for permanent electric power distribution shall be placed underneath of cable trays/ladders with fire resistance cables if the tracks are installed on the same consoles;
- this application is valid for standard and non-standard supporting constructions.

4.4 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 labeling approximately every 50 m.





5. 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:

Ing. Marek Gorlický
Head of the Testing Laboratory

Prepared by:

Ing. Slavomír Hudák
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