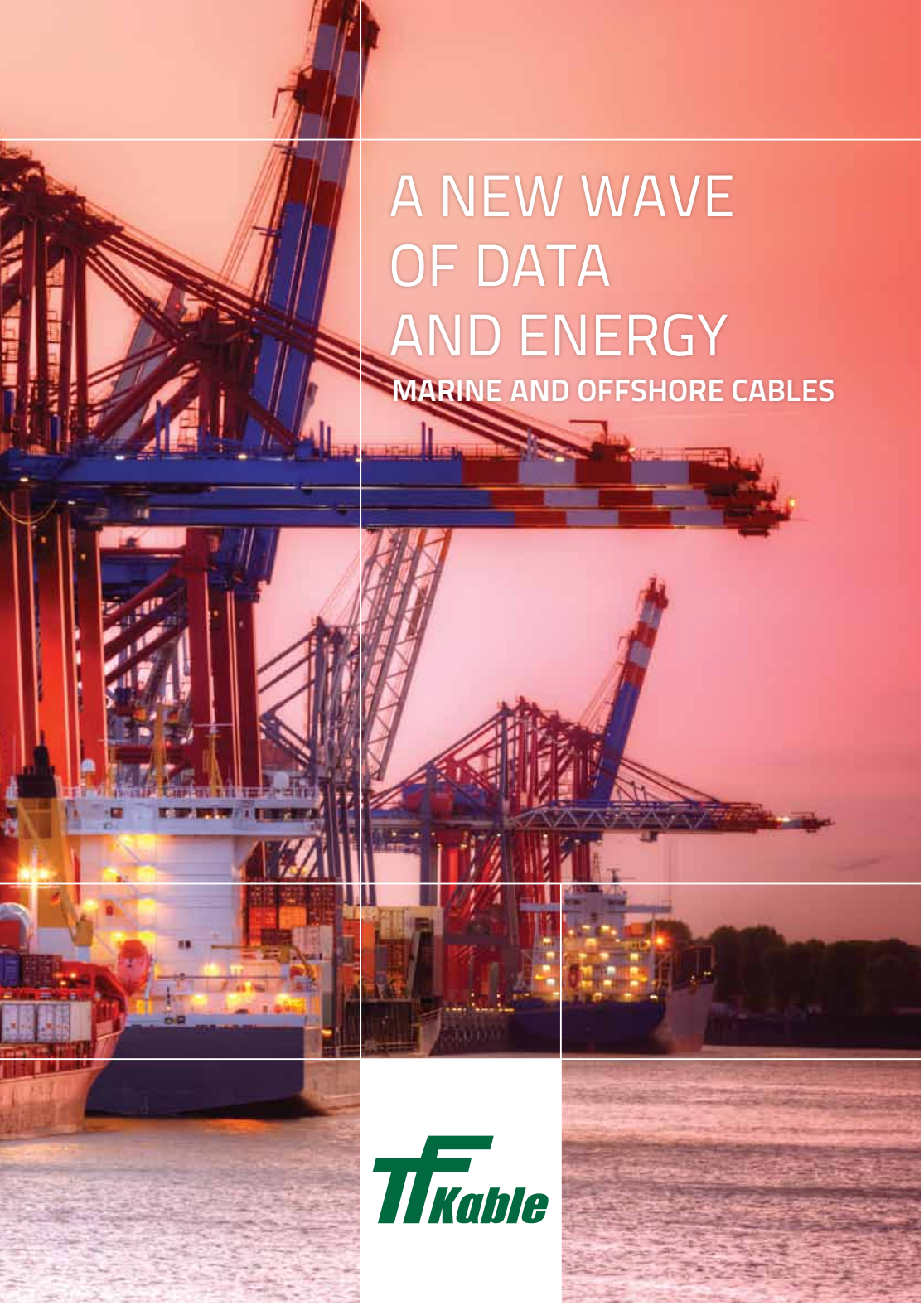


A NEW WAVE OF DATA AND ENERGY

MARINE AND OFFSHORE CABLES

TFKable

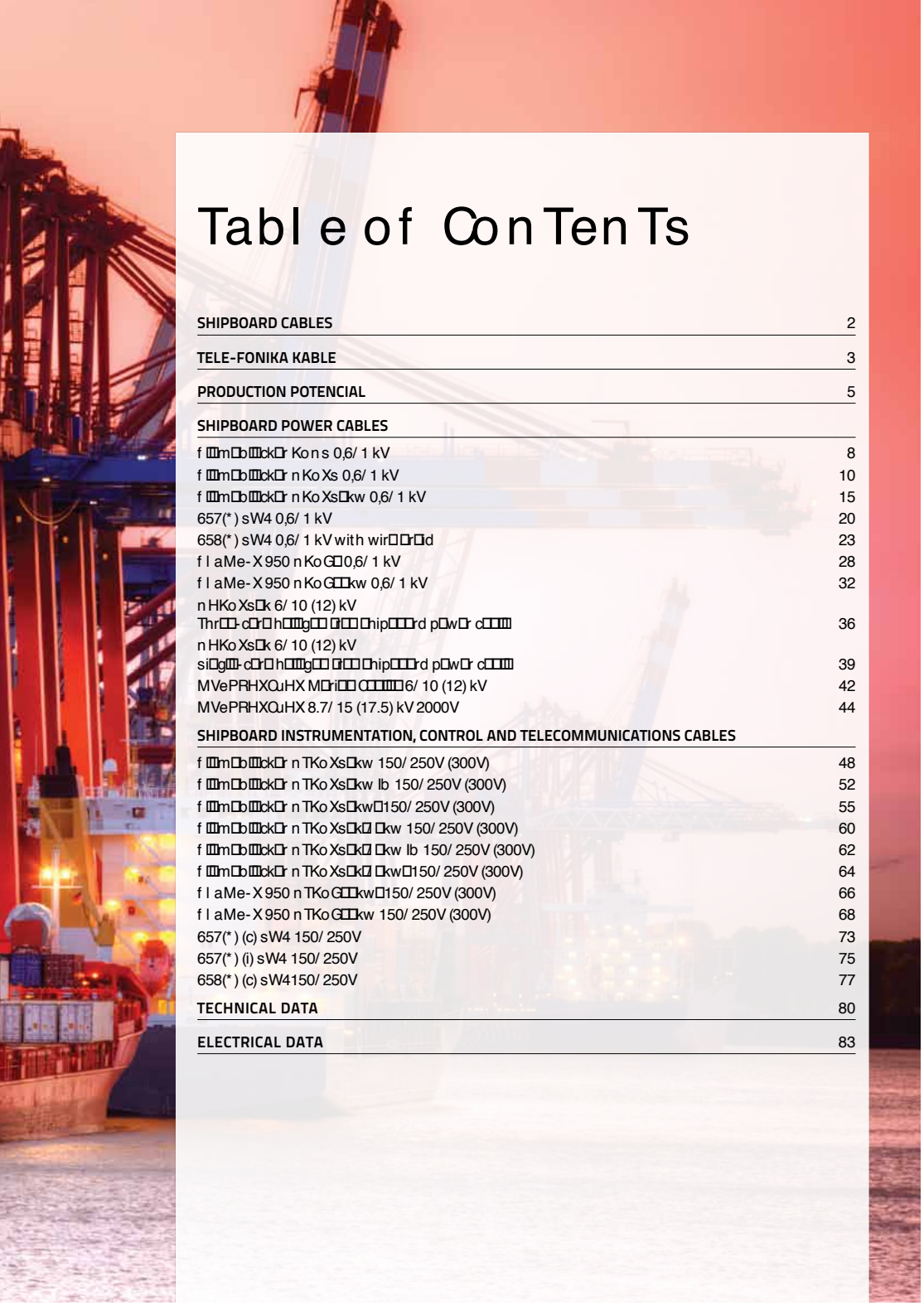


Table of Contents

Marine Cables

Being oī ered by the TELE-FONIKA Kable since the early 90's, marine cables have always been held as an important product in the cables porŋolio. Years of experience, resulEng from frequent contacts with European and Far Eastern shipyards, led to the development of light and compact cable designs characterised by high Ňexibility facilitaEng allow for easy installaEon in severely limited spaces.

The ability of being able to provide cables that can operate reliably in extreme condiEons, to ensure the safety of those aboard sea vessels, is very important for our company. Therefore, all marine cables from our porŋolio are halogen-free, Ňame retardant and do not emit harmful gases when burning. For example, for safety devices such as emergency power ligheng escape routes, you can be assured that our Į re resistant cables will provide the highest standards of safety and will conEnue to funcEon in the harshest of environments.

Cable tesEng is carried out at our state-of-the-art Fire Tests Laboratory (Kraków-Wielicka Plant) for tesEng in accordance with current world standards (IEC 60331 - Fire test for circuit integrity, IEC 60332 - Test for Ňame spread, IEC 61034 - Smoke density test, IEC 60754 - Gases emission test, etc.). Our Cable Design Engineers and Process Managers work conEnuously to develop our designs, which has resulted in the development of opEmum low weight cables and minimal achievable outer diameter, ensuring ease of installaEon in the most challenging vessel installaEon projects.

To ensure that our products meet the highest quality standards, our cables are subjected to third party cerEĮ caEon tesEng such as: Germanischer Lloyd, Lloyd Register, Det Norske Veritas, Polski Rejestr Statków, Registro Italiano Navale; American Bureau of Shipping, ClassNK, Bureau Veritas.

You can be assured of performance when marine cables, manufactured by TELE-FONIKA Kable, are installed onboard the numerous naval vessels operating around the world.

Tel e-f on lKa K□□□□

The Group TELE-FONIKA Kable (TF Kable) is ranked in the forefront of the global cable industry. The Group is the third manufacturer of cables and wires in Europe with significant development potential, based entirely on Polish capital.

TELE-FONIKA Kable Group's considerable investment in research and development centers and mulΘ-skilled work teams, which have included eminent scienΘsts working with our specialists, has been re-warded by the introducΘon of new-generaΘon products and comprehensive services in the ¦eld of cable engineering. Products manufactured in our plants are sold in over 90 countries. Our product assortment includes 25 thousand cable types. The highest quality of our products is con¦rmed by over 460 cerΘ¦cates for groups of wares licensed by 34 renown centres of cerΘ¦caΘons worldwide. The company combines the good tradiΘons of the cable industry in Poland and innovaΘve technical soluΘons. TELE-FONIKA Kable Group consists of seven plants — ¦ve in Poland, one in Ukraine, and one in Serbia. We own over a dozen trade agencies abroad, reaching customers in several dozen countries around the world.

TFKable

exp□ri□□c□ □□d i□□□v□ti□□

PRo DUCTIo n Po Ten CIaI

Our chief asset is extensive technological know-how in the field of production of wide variety of cables and wires supported by our experienced personnel. Our products match to a great extent the general trends concerning ecology and maintenance safety of wares. Extremely strict legislation in these areas has become the indicator of the technological progress of the manufactured cables.

Kraków-Wielicka Plant

Kraków-Wielicka Plant was established in 1928. In 1992 it received the ISO 9002 certificate and in 1998 the ISO 14001 given by the British company BASEC. The plant specializes in the production of rubber insulated cables and wires for mining and industrial applications. All types of rubber mixes used for EPR, CR, EVA and CSP cables are based on an original prescription designed together with research and development centres. The production offer of the plant are also medium voltage cables made in XLPE technology, as well as signal and control wires for special purposes.

Kraków-Bieżanów Plant

Kraków-Bieżanów Plant was established in 2001. In 1992 it received the ISO 9001:2000 certificate 14001:1996 given by the BASEC England company. The plant specializes in the production of overhead conductors from alloyed aluminium, conductors for railway traction network from copper and its alloys and installation wires for general usage.

Bydgoszcz Plant

Bydgoszcz Plant started production of cables and wires back in 1923. In 1992 it received the ISO 9002 certificate and in 1998 the ISO 14001. Bydgoszcz Plant specializes in power supply cables of medium and high voltage up to 400 kV. It is equipped with six modern chain lines for crosslinking polyethylene in XLPE technology. Complementary technological lines for producing the abovementioned cables ranging from thick wire drawing machines, cable stranding machines and screening machines to covering lines and two large-size high voltage laboratories called "Faraday cage" place the plant in the top of the list of the largest production centres of medium and high voltage cables in Europe.

Myślenice Plant

Myślenice Plant was established in April 1992 under the name Zakłady Kablowe TELE-FONIKA s.c. In 1995 it received the ISO 9001:1994 certificate and in 1999 the ISO 14001:1996 certificate given by DQS, Germany. In September 2007 the plant attained the SGS Polska IS/TS 16949 certificate for automotive cables. Myślenice Plant specializes in the production of copper and fibre optic telecommunication cables, computer cables and automotive wires.

Szczecin Plant

Szczecin Plant was established in 1958. In 1992 it received the ISO 9002 certificate and in 1998 the ISO 14001 given by the British company BASEC. It specializes in production of enamelled magnet wires.

TOW TF Kabel Ukraine

The plant was established in 1974. In 2007 the plant was joined into the TELE-FONIKA Kable Group. It specializes in the production of overhead conductors and cables for voltage up to 1 kV, including halogen-free, fire resistant and flame retardant cables versions.

TF Kable Fabrika Kablova Zajecar A.D. (Serbia)

The plant was established in 1974. In 2007 the plant was joined into the TELE-FONIKA Kable Group. It specializes in the production of low and medium voltage cables, as well as halogen-free, fire resistant and flame retardant cables, telecommunication cables and PVC and polyethylene-coated conductors.

TFkable

The way for energy

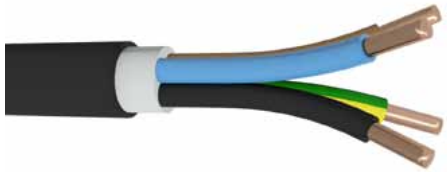
sHIPboaRD PoWeR Cabl es

FlameBlocker KONS 0,6/1 kV

Halogen-free switchboard wire		
Standards: IEC 60092-353		
CONSTRUCTION		
Conductors	Stranded flexible bare or tinned copper class 5 acc. to EN 60228	
Insulation	Halogen-free polyolefin compound type HF90 acc. to IEC 60092-351	
Color of Insulation	Black, red, blue, white, green/yellow	
	Other suitable colour may be used.	
TECHNICAL DATA		
Maximum conductor operating temperature: +90°C		
Lowest ambient temperature for fixed installation: -40°C		
Lowest installation temperature: -15°C		
Maximum short-circuit conductor temperature: +250°C		
Minimum bending radius	Overall diameter of cable (D)	Minimum bending radius
	≤ 25 mm > 25 mm	4 D 6 D
Flame retardant	IEC 60332-1-2 (test for single wire)	
Smoke emission	IEC 61034-2	
Gases evolved during combustion	IEC 60754-1: < 0,5% acid gas IEC 60754-2: pH ≥ 4,3; conductivity ≤ 10 µS/mm¹	
Application	For fixed wiring in switchboards, control panels and other enclosures	
Standard length cable packing	500 or 1000 m on drums. Other forms of packing are available on request.	
Approvals	DNV, ABS	

Number and cross-sectional area of conductor	Approximate overall diameter	Approximate net weight of cables	Current rating in open air	Maximum resistance at 20°C
n x mm²	mm	kg/km	A	Ω/km
1 x 0,75	2,7	13	14	26,0
1 x 1	2,8	15	18	19,5
1 x 1,5	2,9	19	23	13,3
1 x 2,5	3,6	30	40	7,98
1 x 4	4,1	44	51	4,95
1 x 6	4,6	62	52	3,30
1 x 10	6,0	105	72	1,91
1 x 16	7,1	159	96	1,21
1 x 25	8,7	245	127	0,78
1 x 35	9,4	332	157	0,554
1 x 50	11,8	479	196	0,386
1 x 70	13,6	664	242	0,272
1 x 95	16,1	879	293	0,206
1 x 120	17,2	1104	339	0,161

FlameBlocker NKOXS 0,6/1 kV



Halogen- free shipboard power cables		
Standards: IEC 60092-353		
CONSTRUCTION		
Conductors	– circular stranded bare or tinned copper class 2 1 to 6 mm² – circular compacted stranded bare or tinned copper class 2 10 to 300 mm² – circular stranded bare or tinned copper class 5 – sector shaped 35 to 300 mm² acc. to IEC 60228	
Insulation	Cross-linked polyethylene HFXLPE 90°C, > 35 mm² cross-linked polyolefin compound HF90 acc. to IEC 60092-351	
Inner covering	Special flame-retardant, halogen-free compound for cables up to 16 mm², – tape bedding and special flame-retardant, halogen-free compound for cables 25 mm² and above – circular compacted stranded conductor, – tape bedding for cables 35 mm² and above – sector shaped conductor	
Sheath	Thermoplastic halogen- free polyolefin compound type ST-HF1 acc. to IEC 60092-359	
Colour of Sheath	Black or grey	
Core identification	NKOXS	NKOXSzo
1-core	not specified	green-yellow
2-core	black, blue	–
3-core	black, blue, brown	green-yellow, black, blue
4-core	blue, brown, black, grey	green-yellow, black, blue, brown
5 and more:	white with black numbering	green-yellow, others core white with black numbering
or acc. to HD 308 S2:		
2-core	blue, brown	–
3-core	black, grey	green-yellow, blue, brown
4-core	blue, brown, black, grey	green-yellow, brown, black, grey
5-core	blue, brown, black, grey, black	green-yellow, blue, brown, black, grey
	Other suitable colour codes may be used	Other suitable colour codes may be used
TECHNICAL DATA		
Maximum conductor operating temperature: +90°C		
Lowest ambient temperature for fixed installation: -40°C		
Lowest installation temperature: -15°C		
Maximum short-circuit conductor temperature: +250°C		
Minimum bending radius	Overall diameter of cable (D) ≤ 25 mm > 25 mm	Minimum bending radius 4D 6D
Flame retardant	IEC 60332-3-22 Kategoria A	
Smoke emission	IEC 61034-2	
Gases evolved during combustion	IEC 60754-1: < 0,5% acid gas IEC 60754-2 pH ≥ 4,3; conductivity ≤ 10 µS/mm¹	
Application	For fixed installations in all areas and open decks in ships	
Standard length cable packing	1000 m on drums. Other forms of packing are available on request	
Approvals	PRS, GL, DNV, LR, ABS, RINA, CLASSNK, BV	

Number and cross-sectional area of conductor	Cables with conductor class 2		Cables with conductor class 5	
	Overall diameter	Net weight of cables	Overall diameter	Net weight of cables
n x mm²	mm	kg/km	mm	kg/km
1 x 1	4,7	31	4,6	30
1 x 1,5	5,0	38	4,9	36
1 x 2,5	5,4	49	5,4	47
1 x 4	5,9	65	5,9	62
1 x 6	6,5	87	6,4	82
1 x 10	7,4	130	7,6	127
1 x 16	8,4	188	8,7	184
1 x 25	10,3	290	10,5	277
1 x 35	11,4	384	11,2	365
1 x 50	13,1	530	13,6	536
1 x 70	14,6	735	15,6	736
1 x 95	16,8	997	17,9	956
1 x 120	18,6	1246	19,4	1203
1 x 150	20,6	1529	21,6	1491
1 x 185	22,7	1905	24,5	1823
1 x 240	25,6	2457	26,4	2345
1 x 300	27,8	3050	30,4	2925

Number and cross-sectional area of conductor	Cables with conductor class 2		Cables with sector shaped class 2		Cables with conductor class 5	
	Overall diameter	Net weight of cables	Overall diameter	Net weight of cables	Overall diameter	Net weight of cables
n x mm²	mm	kg/km	mm	kg/km	mm	kg/km
2x1	8,3	98	-	-	8,2	95
2x1,5	8,9	118	-	-	8,8	113
2x2,5	9,8	151	-	-	9,8	148
2x4	11,0	204	-	-	10,9	195
2x6	12,1	264	-	-	12,1	253
2x10	13,8	374	-	-	14,1	374
2x16	16	540	-	-	16,6	544
2x25	18,7	668	-	-	19,0	634
2x35	21,0	876	-	-	20,7	837
2x50	24,2	1205	-	-	25,3	1232
3x1	8,8	111	-	-	8,6	106
3x1,5	9,4	135	-	-	9,2	128
3x2,5	10,5	181	-	-	10,5	176
3x4	11,6	242	-	-	11,5	230
3x6	12,8	319	-	-	12,7	303
3x10	14,6	462	-	-	14,9	457
3x16	17,0	677	-	-	17,6	673
3x25	19,9	891	-	-	20,3	863
3x35	22,4	1195	19,6	1114	22,1	1139
3x50	26,0	1664	22,3	1550	27,2	1693
3x70	29,5	2323	26,0	2186	31,7	2346
3x95	33,9	3145	29,1	2953	36,4	3048
3x120	37,9	3948	32,5	3717	39,7	3844
3x150	42,5	4875	36,4	4593	44,8	4796
3x185	47,0	6084	40,6	5736	50,8	5901
3x240	53,2	7859	45,5	7452	54,8	7551
4x1	9,4	130	-	-	9,3	124
4x1,5	10,3	164	-	-	10,2	157
4x2,5	11,4	218	-	-	11,4	210
4x4	12,6	294	-	-	12,5	279
4x6	14,2	398	-	-	14,1	378
4x10	16,1	580	-	-	16,5	572
4x16	18,8	855	-	-	19,5	847
4x25	22,2	1158	-	-	22,6	1108
4x35	24,9	1560	22,4	1488	24,5	1484
4x50	28,9	2172	25,6	2076	30,3	2205
4x70	32,9	3036	29,7	2921	35,3	3063
4x95	38,0	4135	33,5	3970	40,8	4005
4x120	42,1	5168	37,5	4976	44,1	5018

Number and cross-sectional area of conductors	Cables with conductors class 2		Cables with sector-shaped class 2		Cables with conductors class 5	
	Overall diameter	Net weight of cables	Overall diameter	Net weight of cables	Overall diameter	Net weight of cables
n x mm²	mm	kg/km	mm	kg/km	mm	kg/km
4x150	47,5	6410	41,8	6160	50,0	6293
4x185	52,5	7992	46,4	7687	56,7	7733
4x240	59,4	10322	52,1	9995	61,2	9910
5x1	10,4	157	-	-	10,2	150
5x1,5	11,2	194	-	-	11	184
5x2,5	12,4	259	-	-	12,3	249
5x4	14,0	359	-	-	13,8	340
5x6	15,5	479	-	-	15,4	454
5x10	17,6	703	-	-	18,0	691
5x16	20,5	1039	-	-	21,4	1030
5x25	24,6	1447	-	-	25,1	1384
5x35	27,7	1948	-	-	27,3	1858
5x50	32,1	2714	27,7	2608	33,6	2758
5x70	36,7	3811	32,2	3680	39,4	3851
			[illegible]			
6x1,5	12,1	226	-	-	11,9	214
6x2,5	13,6	310	-	-	13,5	298
			[illegible]			
7x1	11,2	186	-	-	11,0	178
7x1,5	12,1	233	-	-	11,9	221
7x2,5	13,6	323	-	-	13,5	309
			[illegible]			
8x1,5	13,0	264	-	-	12,8	250
	[illegible]					
9x1,5	13,9	304	-	-	13,7	288
			[illegible]			
10x1	14,1	267	-	-	13,8	254
10x1,5	15,2	333	-	-	15,0	317
10x2,5	17,2	464	-	-	17,1	444
12x1	14,5	293	-	-	14,2	279
12x1,5	15,7	370	-	-	15,4	350
12x2,5	17,7	519	-	-	17,6	496
14x1,5	16,7	423	-	-	16,4	400
			[illegible]			
16x1	16,1	370	-	-	15,8	351
16x1,5	17,5	471	-	-	17,2	444
16x2,5	19,7	662	-	-	19,7	633

Number and cross-sectional area of conductor	Cables with conductor class 2		Cables with sector shaped class 2		Cables with conductor class 5	
	Overall diameter	Net weight of cables	Overall diameter	Net weight of cables	Overall diameter	Net weight of cables
n x mm²	mm	kg/km	mm	kg/km	mm	kg/km
19 x 1	17,0	414	-	-	16,6	392
19 x 1,5	18,4	529	-	-	18,1	499
19 x 2,5	20,8	751	-	-	20,7	715
20 x 1	17,8	456	-	-	17,3	431
20 x 1,5	19,5	591	-	-	19,2	559
20 x 2,5	22,0	833	-	-	21,9	796
24 x 1	19,8	524	-	-	19,3	496
24 x 1,5	21,8	682	-	-	21,4	643
24 x 2,5	24,3	951	-	-	24,3	907
27 x 1	20,2	564	-	-	19,7	534
27 x 1,5	22,2	738	-	-	21,8	694
27 x 2,5	25,1	1048	-	-	25,0	997
30 x 1	20,9	611	-	-	20,4	579
30 x 1,5	23,0	801	-	-	22,6	754
30 x 2,5	25,9	1142	-	-	25,9	1086
37 x 1	22,7	729	-	-	22,1	689
37 x 1,5	24,9	958	-	-	24,5	901
37 x 2,5	28,1	1370	-	-	28,1	1302

FlameBlocker NKOXSekw 0,6/1 kV

Halogen-free shipboard power cables with cross-linked polyethylene insulation and halogen-free sheath, with screen

Standards: IEC 60092-353

CONSTRUCTION		
Conductors	– circular stranded bare or tinned copper class 2 1 to 6 mm² – circular compacted stranded bare or tinned copper class 2 10 to 300 mm² – circular stranded bare or tinned copper class 5 – sector shaped 35 to 300 mm² acc. to IEC 60228	
Insulation	Cross-linked polyethylene HFXLPE 90°C, > 35 mm² cross-linked polyolefin compound HF90 acc. to IEC 60092-351	
Inner covering	Special flame-retardant, halogen-free compound for cables up to 16 mm², – tape bedding and special flame-retardant, halogen-free compound for cables 25 mm² and above – circular compacted stranded conductor, – tape bedding for cables 35 mm² and above – sector shaped conductor	
Screen (and inner)	Copper wire braiding	
Sheath	Thermoplastic halogen- free polyolefin compound type SHF1 acc. to IEC 60092-359	
Color of Sheath	Black or grey	
Core identification	NKOXSekw	NKOXSekw zo
1-core	not specified	green-yellow
2-core	black, blue	–
3-core	black, blue, brown	green-yellow, black, blue
4-core	blue, brown, black, grey	green-yellow, black, blue, brown
5 and more:	white with black numbering	green-yellow, others cores white with black numbering
old acc. to HD 308 S2		
2-core	blue, brown	–
3-core	black, grey	green-yellow, blue, brown
4-core	blue, brown, black, grey	green-yellow, brown, black, grey
5-core	blue, brown, black, grey, black	green-yellow, blue, brown, black, grey
	Other suitable colour codes may be used	Other suitable colour codes may be used

TECHNICAL DATA	
Maximum conductor operating temperature: +90°C	
Lowest ambient temperature for fixed installation: -40°C	
Lowest installation temperature: -15°C	
Maximum short-circuit conductor temperature: +250°C	
Minimum bending radius	IEC 60332-3-22 Kategoria A
Minimum bending radius	6 D, D = Overall diameter of cable
Smoke emission	IEC 61034-2
Gases evolved during combustion	IEC 60754-1: < 0,5% acid gas IEC 60754-2: pH ≥ 4,3; conductivity ≤ 10 µS/mm¹
Application	For fixed installations in all areas and open decks in ships
Standard length cable packing	1000 m on drums. Other forms of packing are available on request
Approvals	PRS, GL, DNV, LR, ABS, RINA, CLASSNK, BV

Number and cross-sectional area of conductor	Cables with conductor class 2		Cables with conductor class 5	
	Overall diameter	Net weight of cables	Overall diameter	Net weight of cables
n x mm²	mm	kg/km	mm	kg/km
1 x 1	6,3	64	6,2	63
1 x 1,5	6,6	76	6,5	74
1 x 2,5	7,0	88	7,0	87
1 x 4	7,7	115	7,7	111
1 x 6	8,3	137	8,2	132
1 x 10	9,0	183	9,2	181
1 x 16	10,2	254	10,5	250
1 x 25	11,9	364	12,1	351
1 x 35	13,6	503	13,4	484
1 x 50	15,3	664	15,8	671
1 x 70	17,0	880	18,0	900
1 x 95	19,2	1165	20,3	1143
1 x 120	20,8	1425	21,6	1384
1 x 150	23,0	1740	24,0	1704
1 x 185	25,1	2146	26,9	2069
1 x 240	28,0	2705	28,8	2621
1 x 300	30,2	3330	32,8	3236

Number and cross-sectional area of conductors	Cables with conductors class 2		Cables with sectoral shaped class 2		Cables with conductors class 5	
	Overall diameter	Net weight of cables	Overall diameter	Net weight of cables	Overall diameter	Net weight of cables
n x mm²	mm	kg/km	mm	kg/km	mm	kg/km
2x1	9,1	131	-	-	9,0	127
2x1,5	9,7	154	-	-	9,6	145
2x2,5	10,8	191	-	-	10,8	187
2x4	11,8	241	-	-	11,7	233
2x6	13,5	345	-	-	13,5	335
2x10	15,0	462	-	-	15,3	461
2x16	17,2	638	-	-	17,8	640
2x25	20,9	844	-	-	21,2	821
2x35	23,2	1085	-	-	22,9	1045
2x50	26,6	1447	-	-	27,7	1477
			[illegible]			
3x1	9,6	144	-	-	9,4	139
3x1,5	10,4	176	-	-	10,2	170
3x2,5	11,3	222	-	-	11,3	216
3x4	12,4	287	-	-	12,3	276
3x6	14,2	402	-	-	14,1	387
3x10	16,0	560	-	-	16,3	553
3x16	18,2	778	-	-	18,8	772
3x25	22,3	1105	-	-	22,7	1069
3x35	24,8	1442	21,0	1264	24,5	1360
3x50	28,4	1933	23,7	1708	29,6	1965
3x70	32,3	2655	27,6	2382	34,5	2684
3x95	37,1	3580	30,7	3175	39,6	3534
3x120	41,1	4441	34,5	4056	42,9	4386
3x150	45,9	5447	38,4	4977	48,2	5419
3x185	50,4	6716	42,6	6165	54,2	6566
3x240	56,6	8553	47,5	7926	58,2	8265
			[illegible]			
4x1	10,4	171	-	-	10,3	166
4x1,5	11,1	204	-	-	11,0	197
4x2,5	12,2	261	-	-	12,2	253
4x4	14,0	377	-	-	13,9	362
4x6	15,4	488	-	-	15,3	468
4x10	17,3	683	-	-	17,7	673
4x16	20,0	966	-	-	20,7	956
4x25	24,6	1389	-	-	25	1358
4x35	27,3	1816	23,8	1641	26,9	1740
4x50	31,3	2452	27,0	2238	32,7	2514
4x70	36,1	3474	31,3	3115	38,5	3553
4x95	41,2	4635	35,5	4270	44,0	4568
4x120	45,5	5746	39,5	5312	47,5	5649

Number and cross-sectional area of conductors	Cables with conductors class 2		Cables with sector shaped class 2		Cables with conductors class 5	
	Overall diameter	Net weight of cables	Overall diameter	Net weight of cables	Overall diameter	Net weight of cables
nxmm²	mm	kg/km	mm	kg/km	mm	kg/km
4x150	50,9	7054	43,8	6529	53,4	6961
4x185	55,9	8691	48,4	8084	60,1	8487
4x240	62,8	11110	54,1	10383	64,6	10721
5x1	11,2	200	-	-	11,0	192
5x1,5	12,0	240	-	-	11,8	225
5x2,5	13,8	346	-	-	13,7	336
5x4	15,2	454	-	-	15,0	436
5x6	16,9	580	-	-	16,8	555
5x10	19,0	818	-	-	19,4	806
5x16	21,9	1167	-	-	22,8	1172
5x25	26,8	1690	-	-	27,3	1628
5x35	30,1	2237	-	-	29,7	2146
5x50	34,7	3042	29,1	2749	36,2	3115
5x70	39,7	4288	34,0	3916	42,4	4379
6x1,5	13,5	314	-	-	13,3	303
6x2,5	14,8	407	-	-	14,7	395
7x1	12,0	233	-	-	11,8	220
7x1,5	13,5	322	-	-	13,3	310
7x2,5	14,8	421	-	-	14,7	407
8x1,5	14,2	346	-	-	14,0	333
9x1,5	15,3	407	-	-	15,1	391
10x1	15,3	364	-	-	15,0	351
10x1,5	16,6	437	-	-	16,4	420
10x2,5	18,6	582	-	-	18,5	563
12x1	15,9	398	-	-	15,6	384
12x1,5	17,1	491	-	-	16,8	454
12x1,5	19,1	638	-	-	19,0	615
14x1,5	17,9	534	-	-	17,6	511
16x1	17,3	484	-	-	17,0	449
16x1,5	18,9	592	-	-	18,6	565
16x2,5	20,9	789	-	-	20,9	760

Number and cross-sectional area of conductor	Cables with conductor class 2		Cables with sector shaped class 2		Cables with conductor class 5	
	Overall diameter	Net weight of cables	Overall diameter	Net weight of cables	Overall diameter	Net weight of cables
nxmm²	mm	kg/km	mm	kg/km	mm	kg/km
19x1	18,2	527	-	-	17,8	506
19x1,5	19,8	667	-	-	19,5	620
19x2,5	22,2	904	-	-	22,1	868
20x1	19,2	562	-	-	18,7	539
20x1,5	20,7	701	-	-	20,4	669
20x2,5	23,2	951	-	-	23,1	913
24x1	21,0	651	-	-	20,5	624
24x1,5	23,0	824	-	-	22,6	786
24x2,5	25,7	1127	-	-	25,7	1082
27x1	21,6	702	-	-	21,1	672
27x1,5	23,4	880	-	-	23,0	837
27x2,5	26,3	1212	-	-	26,2	1162
30x1	22,3	765	-	-	21,8	716
30x1,5	24,4	954	-	-	24,0	907
30x2,5	27,3	1316	-	-	27,3	1261
37x1	23,9	873	-	-	23,3	833
37x1,5	26,1	1125	-	-	25,7	1068
37x2,5	29,3	1558	-	-	29,3	1490

657(*) SW4 0,6/1 kV

Halogen-free shipboard power cables with elastomer insulation and sheath

Standard: BS6883		
CONSTRUCTION		
Conductors	Tinned annealed circular stranded copper acc. to BS EN 60228 class 5 or class 2 for conductor sizes of 1 and 1,5 mm² and class 2 for all other conductor sizes	
Insulation	Halogen-free elastomeric compound type GP4 acc. to BS 7655-1.2	
Outer sheath	Halogen-free, heat-resistant, oil-resisting and flame-retardant elastomer compound type SW4 acc. to BS 7655-2.6, with low smoke and halogen acid gas emission (≤ 0,5%)	
Colour of sheath	Black	
Core identification	White with printed black numbers or black with printed white numbers	
	or the colours listed	
1-core	red or black	
2-core	red, black	
3-core	red, yellow, blue	
4-core	red, yellow, blue, black	
TECHNICAL DATA		
Maximum conductor operating temperature: +90°C		
Lowest ambient temperature for fixed installation: -40°C		
Lowest installation temperature: -15°C		
Maximum short-circuit conductor temperature: +250°C		
Minimum bending radius	Overall diameter of cable (D) ≤ 10 mm 10 < D ≤ 25 mm > 25 mm	Minimum bending radius 3D 4D 6D
Flame retardant	BS EN 50266-2-2 Category A/F, IEC 60332-3-22 Category A/F	
Smoke emission	BS EN 61034-2, IEC 61034-2	
Gases evolved during combustion	BS EN 50267-2-1, IEC 60754-1: < 0,5% acid gas	
Application	For fixed installations in all areas and open deck in ships and offshore units	
Standard length / cable packing	1000 m on drums. Other forms of packing are available on request	
Approvals	LR	

Number and cross-sectional area of conductors	Minimum number of wires in conductors	Nominal thickness of insulation	Nominal thickness of outer sheath	Approximate overall diameter	Approximate net weight of cables
n x mm²	n / mm	mm	mm	mm	kg/km
1 x 1	0,21	0,8	1,0	4,8	34
1 x 1,5	0,26	0,8	1,0	5,1	40
1 x 2,5	7	0,8	1,0	5,6	54
1 x 4	7	1,0	1,0	6,5	78
1 x 6	7	1,0	1,0	7,1	101
1 x 10	7	1,0	1,0	8,1	144
1 x 16	19	1,0	1,1	9,5	216
1 x 25	19	1,2	1,2	11,4	328
1 x 35	19	1,2	1,2	12,6	429
1 x 50	19	1,4	1,3	14,3	551
1 x 70	19	1,4	1,3	16,0	753
1 x 95	37	1,6	1,4	18,6	1049
1 x 120	37	1,6	1,5	20,3	1274
1 x 150	37	1,8	1,6	22,4	1568
1 x 185	37	2,0	1,7	24,9	1949
1 x 240	61	2,2	1,8	28,0	2530
1 x 300	61	2,4	1,9	30,9	3134
1 x 400	91	2,6	2,0	35,3	4258
1 x 500	91	2,8	2,2	39,3	5337
2 x 1	0,21	0,8	1,0	8,1	86
2 x 1,5	0,26	0,8	1,1	8,5	103
2 x 2,5	7	0,8	1,1	9,5	140
2 x 4	7	1,0	1,2	11,6	210
2 x 6	7	1,0	1,2	12,7	270
2 x 10	7	1,0	1,3	14,9	391
2 x 16	19	1,0	1,4	17,5	574
2 x 25	19	1,2	1,5	21,2	864
2 x 35	19	1,2	1,6	23,7	1129
2 x 50	19	1,4	1,7	26,9	1452
2 x 70	19	1,4	1,9	30,8	1991
2 x 95	37	1,6	2,1	35,9	2766
2 x 120	37	1,6	2,2	39,1	3338
2 x 150	37	1,8	2,3	43,2	4097
3 x 1	0,21	0,8	1,1	8,4	100
3 x 1,5	0,26	0,8	1,1	9,0	122
3 x 2,5	7	0,8	1,1	10,1	169
3 x 4	7	1,0	1,2	12,3	257
3 x 6	7	1,0	1,2	13,5	335
3 x 10	7	1,0	1,3	15,9	490
3 x 16	19	1,0	1,4	18,6	732
3 x 25	19	1,2	1,6	22,7	1121
3 x 35	19	1,2	1,7	25,4	1474

Number and cross-sectional area of conductor	Minimum number of maximum diameter of wires in conductor	Nominal thickness of insulation	Nominal thickness of outer sheath	Approximate overall diameter	Approximate net weight of cables
n x mm²	n / mm	mm	mm	mm	kg/km
3x50	19	1,4	1,8	28,9	1893
3x70	19	1,4	2,0	33,0	2611
3x95	37	1,6	2,2	38,5	3638
3x120	37	1,6	2,3	41,9	4400
3x150	37	1,8	2,5	46,5	5425
3x185	37	2,0	2,7	51,8	6754
3x240	61	2,2	2,9	58,6	8770
4x1	0,21	0,8	1,1	9,1	122
4x1,5	0,26	0,8	1,1	9,8	149
4x2,5	7	0,8	1,1	11,0	210
4x4	7	1,0	1,2	13,4	321
4x6	7	1,0	1,3	15,0	428
4x10	7	1,0	1,4	17,6	627
4x16	19	1,0	1,5	20,7	940
4x25	19	1,2	1,7	25,3	1442
4x35	19	1,2	1,8	28,3	1899
4x50	19	1,4	1,9	32,1	2439
4x70	19	1,4	2,1	36,7	3370
4x95	37	1,6	2,3	42,8	4700
4x120	37	1,6	2,5	46,8	5710
4x150	37	1,8	2,7	51,9	7035
5x1,5	0,26	0,8	1,1	10,7	180
5x2,5	7	0,8	1,2	12,2	260
7x1,5	0,26	0,8	1,2	12,8	252
7x2,5	7	0,8	1,2	14,4	369
12x1,5	0,26	0,8	1,3	15,6	370
12x2,5	7	0,8	1,4	17,9	543
19x1,5	0,26	0,8	1,4	19,4	570
19x2,5	7	0,8	1,5	22,2	842
27x1,5	0,26	0,8	1,6	22,4	766
37x1,5	0,26	0,8	1,7	26,2	1037

658(*) SW4 0,6/1 kV with wire braid

Halogen-free shipboard power cables with elastomer insulation and sheath, with wire braid		
Standard: BS6883		
CONSTRUCTION		
Conductors	Tinned annealed circular stranded copper acc. to BS6360 class 5 or class 2 for conductor sizes of 1 and 1,5 mm² and class 2 for all other conductor sizes	
Insulation	Halogen-free elastomer compound type GP4 acc. to BS7655-1.2	
Inner Sheath	Halogen-free, heat-resistant, oil-resisting and flame-retardant elastomer compound type SW4 acc. to BS7655-2.6	
Wire Braid	Of galvanized steel or tinned annealed copper wires	
Outer Sheath	Halogen-free, heat-resistant, oil-resisting and flame-retardant elastomer compound type SW4 acc. to BS 7655-2.6, with low smoke and halogen acid gas emission (≤ 0,5%)	
Color of Sheath	Black	
Core identification	White with printed black numbers or black with printed white numbers	
	or the colours listed	
1-core	red or black	
2-core	red, black	
3-core	red, yellow, blue	
4-core	red, yellow, blue, black	
TECHNICAL DATA		
Maximum conductor operating temperature: +90°C		
Lowest ambient temperature for fixed installation: -40°C		
Lowest installation temperature: -15°C		
Maximum short-circuit conductor temperature: +250°C		
Minimum bending radius	Overall diameter of cable (D)	Minimum bending radius
	≤ 25 mm	4D
	> 25 mm	6D
Flame retardant	BS EN 50266-2-2 Category A/F, IEC 60332-3-22	
Smoke emission	BS EN 61034-2, IEC 61034-2	
Gases evolved during combustion	BS EN 50267-2-1, IEC 60754-1: ≤ 0,5% acid gas	
Application	For fixed installations in all areas and open decks in ships and offshore units	
Standard length / cable packing	1000 m on drums. Other forms of packing are available on request	
Approvals	LR	

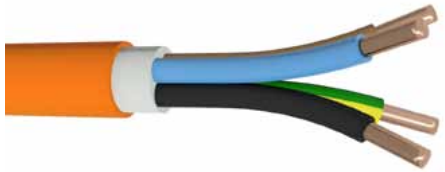
Number and cross-sectional area of conductors	Minimum number of maximum diameter of wires in conductors	Nominal thickness of insulation	Nominal thickness of inner sheath	Nominal diameter of steel wire braid	Nominal thickness of outer sheath	Approximate overall diameter	Approximate net weight of cables
n x mm²	n / mm	mm	mm	mm	mm	mm	kg/km
2x1	0,21	0,8	1,0	0,30	1,2	11,6	200
2x1,5	0,26	0,8	1,1	0,30	1,2	12,4	241
2x2,5	7	0,8	1,1	0,30	1,2	13,4	283
2x4	7	1,0	1,2	0,30	1,3	15,6	387
2x6	7	1,0	1,2	0,30	1,4	16,9	476
2x10	7	1,0	1,3	0,30	1,4	19,2	627
2x16	19	1,0	1,4	0,30	1,5	22,0	863
2x25	19	1,2	1,5	0,30	1,7	26,1	1212
2x35	19	1,2	1,6	0,30	1,8	28,8	1532
2x50	19	1,4	1,7	0,45	2,0	33,0	2038
2x70	19	1,4	1,9	0,45	2,1	37,1	2680
2x95	37	1,6	2,1	0,45	2,3	42,6	3593
2x120	37	1,6	2,2	0,45	2,5	46,2	4291
2x150	37	1,8	2,3	0,45	2,6	50,5	5120
3x1	0,21	0,8	1,1	0,30	1,2	12,2	237
3x1,5	0,26	0,8	1,1	0,30	1,2	12,9	263
3x2,5	7	0,8	1,1	0,30	1,3	14,1	323
3x4	7	1,0	1,2	0,30	1,3	16,3	439
3x6	7	1,0	1,2	0,30	1,4	17,7	547
3x10	7	1,0	1,3	0,30	1,5	20,4	743
3x16	19	1,0	1,4	0,30	1,6	23,3	1029
3x25	19	1,2	1,6	0,30	1,8	27,8	1515
3x35	19	1,2	1,7	0,45	1,9	31,4	2032
3x50	19	1,4	1,8	0,45	2,0	35,0	2547
3x70	19	1,4	2,0	0,45	2,2	39,6	3340
3x95	37	1,6	2,2	0,45	2,4	45,5	4514
3x120	37	1,6	2,3	0,45	2,6	49,3	5408
3x150	37	1,8	2,5	0,45	2,8	54,3	6587
3x185	37	2,0	2,7	0,45	3,0	59,9	8072
3x240	61	2,2	2,9	0,45	3,2	67,1	10311

Number and cross-sectional area of conductor	Minimum number of maximum diameter of wires in conductor	Nominal thickness of insulation	Nominal thickness of inner sheath	Nominal diameter of steel wire braid	Nominal thickness of outer sheath	Approximate overall diameter	Approximate net weight of cables
n x mm²	n / mm	mm	mm	mm	mm	mm	kg/km
4 x 1	0,21	0,8	1,1	0,30	1,2	12,9	262
4 x 1,5	0,26	0,8	1,1	0,30	1,3	13,9	301
4 x 2,5	7	0,8	1,1	0,30	1,3	15,1	384
4 x 4	7	1,0	1,2	0,30	1,4	17,7	532
4 x 6	7	1,0	1,3	0,30	1,5	19,4	673
4 x 10	7	1,0	1,4	0,30	1,6	22,3	917
4 x 16	19	1,0	1,5	0,30	1,7	25,6	1287
4 x 25	19	1,2	1,7	0,45	1,9	31,3	1999
4 x 35	19	1,2	1,8	0,45	2,0	34,4	2498
4 x 50	19	1,4	1,9	0,45	2,2	38,7	3159
4 x 70	19	1,4	2,1	0,45	2,4	43,7	4226
4 x 95	37	1,6	2,3	0,45	2,6	50,2	5718
4 x 120	37	1,6	2,5	0,45	2,8	54,6	6876
4 x 150	37	1,8	2,7	0,45	3,0	60,1	8357
5 x 1,5	0,26	0,8	1,1	0,30	1,3	14,8	351
5 x 2,5	7	0,8	1,2	0,30	1,3	16,3	441
7 x 1,5	0,26	0,8	1,2	0,30	1,3	16,8	452
7 x 2,5	7	0,8	1,2	0,30	1,4	18,6	577
12 x 1,5	0,26	0,8	1,3	0,30	1,5	20,1	621
12 x 2,5	7	0,8	1,4	0,30	1,6	22,6	836
19 x 1,5	0,26	0,8	1,4	0,30	1,6	24,1	888
19 x 2,5	7	0,8	1,5	0,30	1,7	27,1	1202
27 x 1,5	0,26	0,8	1,6	0,30	1,8	27,5	1162
37 x 1,5	0,26	0,8	1,7	0,45	1,9	32,1	1608

Number and cross-sectional area of conductor	Minimum number of maximum diameter of wires in conductor	Nominal thickness of insulation	Nominal thickness of inner sheath	Nominal diameter of copper wire braid	Nominal thickness of outer sheath	Approximate overall diameter	Approximate net weight of cables
n x mm²	n / mm	mm	mm	mm	mm	mm	kg/km
1 x 1	0,21	0,8	1,0	0,20	1,0	7,9	97
1 x 1,5	0,26	0,8	1,0	0,20	1,0	8,3	107
1 x 2,5	7	0,8	1,0	0,20	1,1	8,9	131
1 x 4	7	1,0	1,0	0,20	1,1	9,9	164
1 x 6	7	1,0	1,0	0,20	1,1	10,4	190
1 x 10	7	1,0	1,0	0,20	1,2	11,6	249
1 x 16	19	1,0	1,1	0,20	1,2	13,0	337
1 x 25	19	1,2	1,2	0,30	1,3	15,6	516
1 x 35	19	1,2	1,2	0,30	1,4	17,0	648
1 x 50	19	1,4	1,3	0,30	1,4	18,7	781
1 x 70	19	1,4	1,3	0,30	1,5	20,7	1022
1 x 95	37	1,6	1,4	0,30	1,6	23,4	1363
1 x 120	37	1,6	1,5	0,30	1,7	25,3	1637
1 x 150	37	1,8	1,6	0,30	1,8	27,7	1985
1 x 185	37	2,0	1,7	0,40	1,9	30,7	2471
1 x 240	61	2,2	1,8	0,40	2,0	34,1	3140
1 x 300	61	2,4	1,9	0,40	2,1	37,3	3834
1 x 400	91	2,6	2,0	0,40	2,3	42,0	5081
1 x 500	91	2,8	2,2	0,40	2,5	46,4	6289
2 x 1	0,21	0,8	1,0	0,20	1,2	11,1	182
2 x 1,5	0,26	0,8	1,1	0,20	1,2	12,0	213
2 x 2,5	7	0,8	1,1	0,20	1,2	12,9	257
2 x 4	7	1,0	1,2	0,30	1,3	15,6	397
2 x 6	7	1,0	1,2	0,30	1,4	16,9	488
2 x 10	7	1,0	1,3	0,30	1,4	19,2	640
2 x 16	19	1,0	1,4	0,30	1,5	22,0	868
2 x 25	19	1,2	1,5	0,30	1,7	26,1	1228
2 x 35	19	1,2	1,6	0,30	1,8	28,8	1551
2 x 50	19	1,4	1,7	0,40	1,9	32,6	2029
2 x 70	19	1,4	1,9	0,40	2,1	36,9	2679
2 x 95	37	1,6	2,1	0,40	2,3	42,4	3585
2 x 120	37	1,6	2,2	0,40	2,4	45,8	4255
2 x 150	37	1,8	2,3	0,40	2,6	50,3	5106
3 x 1	0,21	0,8	1,1	0,20	1,2	11,8	204
3 x 1,5	0,26	0,8	1,1	0,20	1,2	12,4	235
3 x 2,5	7	0,8	1,1	0,20	1,2	13,5	298
3 x 4	7	1,0	1,2	0,30	1,3	16,3	449
3 x 6	7	1,0	1,2	0,30	1,4	17,7	568
3 x 10	7	1,0	1,3	0,30	1,5	20,4	756
3 x 16	19	1,0	1,4	0,30	1,6	23,3	1044
3 x 25	19	1,2	1,6	0,30	1,8	27,8	1535

Number and cross-sectional area of conductor	Minimum number of maximum diameter of wires in conductor	Nominal thickness of insulation	Nominal thickness of inner sheath	Nominal diameter of copper wire braid	Nominal thickness of outer sheath	Approximate overall diameter	Approximate net weight of cables
n x mm²	n / mm	mm	mm	mm	mm	mm	kg/km
3 x 35	19	1,2	1,7	0,40	1,9	31,2	1994
3 x 50	19	1,4	1,8	0,40	2,0	34,8	2503
3 x 70	19	1,4	2,0	0,40	2,2	39,4	3339
3 x 95	37	1,6	2,2	0,40	2,4	45,3	4505
3 x 120	37	1,6	2,3	0,40	2,6	49,1	5392
3 x 150	37	1,8	2,5	0,40	2,7	53,9	6531
3 x 185	37	2,0	2,7	0,40	3,0	59,7	8056
3 x 240	61	2,0	2,9	0,40	3,2	66,9	10293
4 x 1	0,21	0,8	1,1	0,20	1,2	12,5	237
4 x 1,5	0,26	0,8	1,1	0,20	1,2	13,2	269
4 x 2,5	7	0,8	1,1	0,30	1,3	15,1	394
4 x 4	7	1,0	1,2	0,30	1,4	17,7	544
4 x 6	7	1,0	1,3	0,30	1,5	19,4	687
4 x 10	7	1,0	1,4	0,30	1,6	22,3	992
4 x 16	19	1,0	1,5	0,30	1,7	25,6	1304
4 x 25	19	1,2	1,7	0,40	1,9	31,0	1961
4 x 35	19	1,2	1,8	0,40	2,0	34,2	2504
4 x 50	19	1,4	1,9	0,40	2,2	38,4	3157
4 x 70	19	1,4	2,1	0,40	2,4	43,5	4217
4 x 95	37	1,6	2,3	0,40	2,6	50,0	5702
4 x 120	37	1,6	2,5	0,40	2,8	54,4	6847
4 x 150	37	1,8	2,7	0,40	3,0	59,9	8342
5 x 1,5	0,26	0,8	1,1	0,30	1,3	14,8	361
5 x 2,5	7	0,8	1,2	0,30	1,3	16,3	451
7 x 1,5	0,26	0,8	1,2	0,30	1,3	16,8	463
7 x 2,5	7	0,8	1,2	0,30	1,4	18,6	589
12 x 1,5	0,26	0,8	1,3	0,30	1,5	20,1	634
12 x 2,5	7	0,8	1,4	0,30	1,6	22,6	850
19 x 1,5	0,26	0,8	1,4	0,30	1,6	24,1	904
19 x 2,5	7	0,8	1,5	0,30	1,7	27,1	1218
27 x 1,5	0,26	0,8	1,6	0,30	1,8	27,5	1181
37 x 1,5	0,26	0,8	1,7	0,40	1,9	31,9	1614

FLAME-X 950 NKOGs 0,6/1 kV



Halogen- free fire resistant shipboard power cables

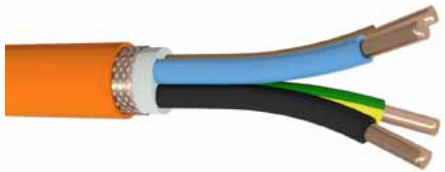
Standard: IEC60092-353		
CONSTRUCTION		
Conductors	Circular or circular compacted stranded bare or tinned copper class 2 acc. to IEC60228	
Insulation	Special cross-linked compound HFS95 acc. to IEC60092-351	
Inner covering	– special flame-retardant, halogen-free compound for cables up to 16 mm², – tape bedding and special flame-retardant, halogen-free compound for cables 25 mm² and above	
Outer sheath	Thermoplastic halogen – free polyolefin compound type SHF1 acc. to IEC60092-359	
Colour of Sheath	Orange	
Core identification	NKOGs	NKOGs zo
1-core	not specified	green-yellow
2-core	black, blue	–
3-core	black, blue, brown	green-yellow, black, blue
4-core	blue, brown, black, grey	green-yellow, black, blue, brown
5-core	black, blue, brown, black, black	green-yellow, black, blue, brown, black
5 and more:	in each layer: brown (starting core), blue (reference core), other cores natural	in outer layer: green-yellow, blue (reference core), others cores shall be natural in other layers: brown (starting core), blue (reference core), other cores natural
colours acc. to HD 308 S2		
2-core	blue, brown	–
3-core	brown, black, grey	green-yellow, blue, brown
4-core	blue, brown, black, grey	green-yellow, brown, black, grey
5-core	blue, brown, black, grey, black	green-yellow, blue, brown, black, grey
	Other suitable colour codes may be used	Other suitable colour codes may be used
TECHNICAL DATA		
Maximum conductor operating temperature: +90°C		
Lowest ambient temperature for fixed installation: -40°C		
Lowest installation temperature: -15°C		
Maximum short-circuit conductor temperature: +250°C		
Minimum bending radius	Overall diameter of cable (D)	Minimum bending radius
	≤ 25 mm	4D
	> 25 mm	6D
Fire resistant	IEC60331-21: for cable diameters ≤ 20 mm; IEC60331-31: for cable diameters > 20 mm	
Flame retardant	IEC60332-3-22 Category A/F	
Smoke emission	IEC61034-2	
Gases evolved during combustion	IEC60754-1: < 0,5% acid gas IEC60754-2 pH ≥ 4,3; conductivity ≤ 10 µS/mm[1]	
Application	For fixed installations in all areas and open decks in ships	
Standard length / cable packing	500 or 1000 m on drums. Other forms of packing are available on request	
Approvals	PRS, GL, DNV, LR, ABS, RINA, CLASSNK, BV	

Number and cross-sectional area of conductor	Approximate overall diameter	Approximate net weight of cables	Maximum conductor resistance at temperature 20°C
n x mm²	mm	kg/km	Ω/km
1 x 1	5,3	39	18,1
1 x 1,5	5,6	46	12,1
1 x 2,5	6,0	59	7,41
1 x 4	6,7	80	4,61
1 x 6	7,3	103	3,08
1 x 10	8,0	143	1,83
1 x 16	9,0	204	1,15
1 x 25	10,9	311	0,727
1 x 35	12,0	407	0,524
1 x 50	13,9	548	0,387
1 x 70	15,4	755	0,268
1 x 95	17,8	1026	0,193
1 x 120	19,4	1269	0,153
1 x 150	21,6	1564	0,124
1 x 185	23,7	1941	0,0991
1 x 240	26,8	2507	0,0754
1 x 300	29,2	3116	0,0601
2 x 1	9,5	128	18,1
2 x 1,5	10,3	155	12,1
2 x 2,5	11,2	193	7,41
2 x 4	12,2	244	4,61
2 x 6	13,5	315	3,08
2 x 10	15,0	424	1,83
2 x 16	17,2	599	1,15
2 x 25	20,9	769	0,727
2 x 35	23,2	1001	0,524
2 x 50	26,8	1394	0,387
3 x 1	10,0	144	18,1
3 x 1,5	10,9	176	12,1
3 x 2,5	11,8	222	7,41
3 x 4	13,1	294	4,61
3 x 6	14,3	377	3,08
3 x 10	16,1	527	1,83
3 x 16	18,2	743	1,15
3 x 25	22,4	1033	0,727

Number and cross-sectional area of conductor	Approximate overall diameter	Approximate net weight of cables	Maximum conductor resistance at temperature 20°C
nxmm²	mm	kg/km	Ω/km
3x35	24,9	1365	0,524
3x50	28,7	1811	0,387
3x70	32,2	2492	0,268
3x95	37,5	3400	0,193
3x120	40,8	4169	0,153
3x150	45,8	5170	0,124
3x185	50,3	6397	0,0991
3x240	57,0	8254	0,0754
4x1	11,1	174	18,1
4x1,5	11,8	207	12,1
4x2,5	12,8	264	7,41
4x4	14,3	353	4,61
4x6	15,6	456	3,08
4x10	17,6	646	1,83
4x16	20,2	929	1,15
4x25	24,8	1319	0,727
4x35	27,6	1735	0,524
4x50	32,1	2343	0,387
4x70	35,7	3212	0,268
4x95	41,8	4400	0,193
4x120	45,7	5436	0,153
4x150	51,0	6697	0,124
4x185	56,0	8295	0,0991
4x240	63,6	10735	0,0754
5x1	12,0	207	18,1
5x1,5	12,8	247	12,1
5x2,5	14,2	326	7,41
5x4	15,6	428	4,61
5x6	17,3	564	3,08
5x10	19,4	798	1,83
5x16	22,4	1153	1,15
5x25	27,3	1641	0,727
5x35	30,5	2179	0,524
5x50	35,7	2965	0,387
5x70	39,5	4037	0,268

Number and cross-sectional area of conductor	Approximate overall diameter	Approximate net weight of cables	Maximum conductor resistance at temperature 20°C
nxmm²	mm	kg/km	Ω/km
7x1	13,2	253	18,1
7x1,5	14,1	306	12,1
7x2,5	15,4	398	7,41
10x1	16,7	363	18,1
10x1,5	17,8	439	12,1
10x2,5	19,8	583	7,41
12x1	17,2	400	18,1
12x1,5	18,4	487	12,1
12x2,5	20,4	660	7,41
14x1,5	19,5	562	12,1
16x1	19,2	506	18,1
16x1,5	20,5	618	12,1
16x2,5	22,8	831	7,41
19x1	20,2	566	18,1
19x1,5	21,8	706	12,1
19x2,5	24,0	940	7,41
20x1	21,1	604	18,1
20x1,5	22,9	754	12,1
20x2,5	25,3	1014	7,41
24x1	23,6	717	18,1
24x1,5	25,6	896	12,1
24x2,5	28,3	1205	7,41
30x1	25,2	850	18,1
30x1,5	27,2	1063	12,1
30x2,5	30,2	1440	7,41
37x1	27,1	1001	18,1
37x1,5	29,3	1258	12,1
37x2,5	32,9	1746	7,41

FLAME-X 950 NKOGsekw 0,6/1 kV



Halogen- free fire resistant shipboard power cables

Standard: IEC60092-353		
CONSTRUCTION		
Conductors	Circular or circular compacted stranded bare or tinned copper class 2 acc. to IEC60228	
Insulation	Special cross-linked compound HFS95 acc. to IEC60092-351	
Inner covering	– special flame-retardant, halogen-free compound for cables up to 16 mm², – tape bedding and special flame-retardant, halogen-free compound for cables 25 mm² and above	
Outer sheath	Thermoplastic halogen – free polyolefin compound type SHF1 acc. to IEC60092-359	
Colour of Sheath	Orange	
Core identification	NKOGsekw	NKOGsekw żo
1-core	not specified	green-yellow
2-core	black, blue	–
3-core	black, blue, brown	green-yellow, black, blue
4-core	blue, brown, black, grey	green-yellow, black, blue, brown
5-core	black, blue, brown, black, black	green-yellow, black, blue, brown, black
5 and more:	in each layer: brown (starting core), blue (reference core), other cores natural	in outer layer: green-yellow, blue (reference core), others cores shall be natural in other layers: brown (starting core), blue (reference core), other cores natural
or acc. to HD 308 S2		
2-core	blue, brown	–
3-core	brown, black, grey	green-yellow, blue, brown
4-core	blue, brown, black, grey	green-yellow, brown, black, grey
5-core	blue, brown, black, grey, black	green-yellow, blue, brown, black, grey
	Other suitable colour codes may be used	Other suitable colour codes may be used
TECHNICAL DATA		
Maximum conductor operating temperature: +90°C		
Lowest ambient temperature for fixed installation: -40°C		
Lowest installation temperature: -15°C		
Maximum short-circuit conductor temperature: +250°C		
Minimum bending radius: 6 D (D- Overall diameter of cable		
Fire resistant	IEC60331-21: for cable diameters ≤ 20 mm; IEC60331-31: for cable diameters > 20 mm	
Flame retardant	IEC60332-3-22 Category A/F	
Smoke emission	IEC61034-2	
Gases evolved during combustion	IEC60754-1: < 0,5% acid gas IEC60754-2: pH ≥ 4,3; conductivity ≤ 10 µS/mm¹	
Application	For fixed installations in all areas and open decks in ships	
Standard length cable packing	500 or 1000 m on drums. Other forms of packing are available on request	
Approvals	RMRS, GL, DNV, LR, ABS, RINA, CLASSNK, BV	

Number and cross-sectional area of conductor	Approximate overall diameter	Approximate net weight of cables	Maximum conductor resistance at temperature 20°C
n x mm²	mm	kg/km	Ω/km
1 x 1	6,9	82	18,1
1 x 1,5	7,4	98	12,1
1 x 2,5	7,8	112	7,41
1 x 4	8,3	136	4,61
1 x 6	8,9	160	3,08
1 x 10	9,6	208	1,83
1 x 16	10,8	281	1,15
1 x 25	12,5	403	0,727
1 x 35	14,2	556	0,524
1 x 50	16,1	721	0,387
1 x 70	17,4	924	0,268
1 x 95	20,0	1227	0,193
1 x 120	21,6	1494	0,153
1 x 150	23,6	1801	0,124
1 x 185	25,7	2220	0,0991
1 x 240	28,8	2793	0,0754
1 x 300	31,2	3435	0,0601
2 x 1	10,3	174	18,1
2 x 1,5	10,9	199	12,1
2 x 2,5	12,0	240	7,41
2 x 4	13,0	300	4,61
2 x 6	14,7	416	3,08
2 x 10	16,2	539	1,83
2 x 16	18,4	724	1,15
2 x 25	22,1	937	0,727
2 x 35	24,4	1187	0,524
2 x 50	28,2	1570	0,387
3 x 1	10,8	190	18,1
3 x 1,5	11,7	227	12,1
3 x 2,5	12,6	283	7,41
3 x 4	14,3	400	4,61
3 x 6	15,5	480	3,08
3 x 10	17,3	646	1,83
3 x 16	19,6	883	1,15
3 x 25	23,6	1219	0,727

Number and cross-sectional area of conductor	Approximate overall diameter	Approximate net weight of cables	Maximum conductor resistance at temperature 20°C
nxmm²	mm	kg/km	Ω/km
3x35	26,1	1578	0,524
3x50	29,9	2060	0,387
3x70	33,4	2766	0,268
3x95	39,3	3862	0,193
3x120	42,6	4684	0,153
3x150	47,4	5665	0,124
3x185	51,9	6941	0,0991
3x240	58,6	8870	0,0754
4x1	11,9	226	18,1
4x1,5	12,6	269	12,1
4x2,5	13,6	324	7,41
4x4	15,5	459	4,61
4x6	17,0	586	3,08
4x10	18,8	783	1,83
4x16	21,4	1079	1,15
4x25	26,0	1541	0,727
4x35	28,8	1957	0,524
4x50	33,3	2617	0,387
4x70	37,3	3607	0,268
4x95	43,4	4993	0,193
4x120	47,3	5930	0,153
4x150	52,6	7248	0,124
4x185	57,6	8900	0,0991
4x240	65,2	11422	0,0754
5x1	12,8	269	18,1
5x1,5	13,6	308	12,1
5x2,5	15,4	433	7,41
5x4	17,0	560	4,61
5x6	18,5	704	3,08
5x10	20,6	953	1,83
5x16	23,6	1320	1,15
5x25	28,7	1833	0,727
5x35	31,7	2375	0,524
5x50	37,3	3286	0,387
5x70	41,1	4388	0,268

Number and cross-sectional area of conductor	Approximate overall diameter	Approximate net weight of cables	Maximum conductor resistance at temperature 20°C
nxmm²	mm	kg/km	Ω/km
7x1	14,4	363	18,1
7x1,5	15,3	414	12,1
7x2,5	16,6	523	7,41
10x1	17,9	506	18,1
10x1,5	19,0	580	12,1
10x2,5	21,0	739	7,41
12x1	18,4	544	18,1
12x1,5	19,8	638	12,1
12x2,5	21,6	808	7,41
14x1,5	20,7	713	12,1
16x1	20,4	668	18,1
16x1,5	21,7	778	12,1
16x2,5	24,0	1007	7,41
19x1	21,4	727	18,1
19x1,5	23,0	884	12,1
19x2,5	25,4	1136	7,41
20x1	22,5	792	18,1
20x1,5	24,1	980	12,1
20x2,5	26,5	1223	7,41
24x1	24,8	903	18,1
24x1,5	26,8	1107	12,1
24x2,5	29,5	1440	7,41
27x1	25,5	972	18,1
27x1,5	27,3	1180	12,1
27x2,5	30,2	1546	7,41
30x1	26,4	1064	18,1
30x1,5	28,4	1275	12,1
30x2,5	31,4	1676	7,41
37x1	28,5	1228	18,1
37x1,5	30,5	1496	12,1
37x2,5	34,1	2006	7,41

NHKOXSek 6/10 (12) kV

Three-core halogen free shipboard power cable type NHKOXSek 6/10 (12) kV	
Standard: 60092-354	
CONSTRUCTION	
Conductors	Bare copper conductor, round, stranded and compacted Class 2 acc. to BS EN 60228
Insulation	– extruded semi-conducting conductor screen – insulation XLPE, dry cured – extruded semi-conducting insulation screen, fully bonded
Screen	– semi-conducting tape – metallic screen, double bare copper tapes over each core
Forming	Assembly of cores with central filler
Inner covering	Halogen free compound
Separator	Separating tape – optionally
Armour (over all screen):	Bare copper braid
Separator	Separating tape – optionally
Outer sheath	Halogen free compound type 9-HF1
Colour of Sheath	Red
TECHNICAL DATA	
Maximum conductor operating temperature: +90°C	
Short circuit (duration max 5s): Max 250°	
Lowest ambient temperature for fixed installation: -40°C	
Lowest installation temperature: -5°C	
Minimum bending Radius	15 x D; D – overall diameter of cable
Flame retardant	IEC 60332-3-22 Category A/F
Smoke emission	IEC 61034-2
Corrosive gas emission	IEC 60754-1: < 0,5% acid gas IEC 60754-2 pH ≥ 4,3; conductivity ≤ 10 µS/mm[1]
Application	Used for fixed installations on board of ships. Laying in air, but not on open decks
Approvals	GL

DESCRIPTION	UNIT	DETAILS		
Number and nominal cross-section of the conductors	No x mm²/mm²	3x25/16	3x35/16	3x50/16
CONSTRUCTION DATA				
Phase copper round conductor – nominal cross sectional area – number of wires – diameter and tolerance	 mm² No mm	 25 7 5.98$^{+0.12}$	 35 7 7.0$^{+0.15}$	 50 19 8.25$^{+0.2}$
Minimum thickness of semi-conducting XLPE on conductor	mm	0.30		
Insulation thickness – minimum average – minimum at a point	 mm mm	 3.4 2.96		
Approximate diameter over insulation	mm	14.3	15.4	16.7
Minimum thickness of semi-conducting XLPE on insulation	mm	0.30		
Approximate thickness of semi-conducting tape	mm	0.4		
Metallic screen over each core – nominal cross sectional area – copper tapes, no. and dimensions	 mm² No x mm x mm	 ≥ 16 6 x 25 x 0.12		
Approximate diameter over stranded cores	mm	36.2	38.5	41.3
Approximate thickness of inner covering	mm	1.4		
Nominal dia. of wires of bare copper braid	mm	0.4		
Outer sheath thickness nominal minimum at a point	 mm mm	 2.5 1.80	 2.5 1.80	 2.7 1.96
Approximate overall diameter of complete cable (D)	mm	46.9	49.1	52.3
Approximate weight of complete cable	kg/km	3237	3684	4332
DELIVERY DATA				
Length per drum ± 5%	m	500		
Diameter and max. width of wooden drum type	m x m	2.00 x 1.09 20	2.00 x 1.09 20A	2.00 x 1.09 20A
Approximate weight of reel including cable	kg	2061	2251	2575
MECHANICAL DATA				
Recommended minimum bending radius for laying	m	0.70	0.74	0.78
Maximum permissible pulling force with a pulling eye on conductors	 kN	 3.75	 5.25	 7.50
ELECTRICAL DATA				
Maximum DC phase conductor resistance at 20 °C Maximum AC phase conductor resistance at 90 °C	Ω/km Ω/km	0.727 0.927	0.524 0.668	0.387 0.496
SHORT CIRCUIT CURRENTS				
Maximum permissible thermal short-circuit current for 1 sec. Phase conductor from 90 °C to 250 °C Metallic screen from 70 °C to 350 °C	 kA kA	 3.6 3.7	 5.0 3.7	 7.2 3.7
AMPACITY, acc. to IEC 60092-352 Table V				
In free air, ambient temperature +45 °C	A	115	135	170

DESCRIPTION	UNIT	DETAILS			
Number and nominal cross-section of the conductors	No. x mm²/mm²	3x70/16	3x95/16	3x120/16	3x150/25
CONSTRUCTION DATA					
Phase copper round conductor – nominal cross sectional area – number of wires – diameter and tolerance	 mm² No. mm	 70 19 9.6+0.2	 95 19 11.5+0.2	 120 36 12.9+0.25	 150 36 14.5+0.3
Minimum thickness of semi-conducting XLPE on conductor	mm	0.30			
Insulation thickness – minimum average – minimum at a point	 mm mm	3.40 2.96			
Approximate diameter over insulation	mm	18.0	19.9	21.4	23.0
Minimum thickness of semi-conducting XLPE on insulation	mm	0.30			
Approximate thickness of semi-conducting tape	mm	0.4			
Metallic screen over each core – nominal cross sectional area – copper tapes, no. and dimensions	 mm² No. x mm x mm	 ≥ 16 6 x 30 x 0.10			 ≥ 25 6 x 40 x 0.12
Approximate diameter over stranded cores	mm	44.0	48.1	51.2	54.9
Approximate thickness of inner covering	mm	1.4	1.6		
Nominal dia. of wires of bare copper braid	mm	0.4			
Outer sheath thickness – nominal – minimum at a point	 mm mm	 2.8 2.04	 3.0 2.20	 3.1 2.28	 3.2 2.36
Approximate overall diameter of complete cable (D)	mm	55.3	60.2	63.5	67.4
Approximate weight of complete cable	kg/km	5 127	6 332	7 321	8 522
DELIVERY DATA					
Length per drum ± 5%	m	500			
Diameter and max. width of wooden drum – type	m x m	2.00 x 1.09 20A	2.20 x 1.34 22	2.40 x 1.44 24	2.40 x 1.44 24
Approximate weight of reel including cable	kg	2 973	3 782	4 415	5 015
MECHANICAL DATA					
Recommended minimum bending radius for laying	m	0.83	0.90	0.95	1.01
Maximum permissible pulling force with a pulling eye on conductors	kN	10.50	14.25	18.00	22.50
ELECTRICAL DATA					
Maximum DC phase conductor resistance at 20°C Maximum AC phase conductor resistance at 90°C	Ω/km Ω/km	0.268 0.345	0.193 0.249	0.153 0.198	0.124 0.163
SHORT CIRCUIT CURRENTS					
Maximum permissible thermal short-circuit current for 1 sec. Phase conductor from 90°C to 250°C Metallic screen from 70°C to 350°C	 kA kA	 10.0 3.7	 13.6 3.7	 17.2 3.7	 21.5 5.3
AMPACITY, acc. to IEC 60092-352 Table V					
In free air, ambient temperature +45°C	A	210	260	300	345

NHKOXSek 6/10 (12) kV

Single-core halogen free shipboard power cable type NHKOXSek 6/10 (12) kV	
Standard: IEC 60092-354	
CONSTRUCTION	
Conductors	Bare copper conductor, round, stranded and compacted Class 2 acc. to BS EN 60228
Insulation	– extruded semi-conducting conductor screen – insulation XLPE, dry cured – extruded semi-conducting insulation screen, fully bonded
Screen	– semi-conducting tape – metallic screen, double bare copper tapes over each core
Inner covering	Halogen free compound
Separator	Separating tape – optionally
Armour (overall screen):	Bare copper braid
Separator	Separating tape – optionally
Outer sheath	Halogen free compound type 9-HF1
Colour of Sheath	Red
TECHNICAL DATA	
Maximum conductor operating temperature: +90°C	
Short circuit (duration max 5s): Max 250°	
Lowest ambient temperature for fixed installation: -40°C	
Lowest installation temperature: -5°C	
Minimum bending Radius	15 x D; D – overall diameter of cable
Flame retardant	IEC 60332-3-22 Category A/F
Smoke emission	IEC 61034-2
Corrosive gas emission	IEC 60754-1: < 0,5% acid gas IEC 60754-2 pH ≥ 4,3; conductivity ≤ 10 µS/mm¹
Application	Used for fixed installations on board of ships. Laying in air, but not on open decks
Approvals	GL

TECHNICAL SPECIFICATION						
DESCRIPTION	UNIT	DETAILS				
Number and nominal cross-section of the conductors	No x mm²/mm²	1x25/16	1x35/16	1x50/16	1x70/16	1x95/16
CONSTRUCTION DATA						
Phase copper round conductor – nominal cross sectional area – number of wires – diameter and tolerance	 mm² No mm	 25 7 5.98$^{-0.12}$	 35 7 7.0$^{-0.15}$	 50 19 8.25$^{-0.2}$	 70 19 9.6$^{-0.2}$	 95 19 11.5$^{-0.2}$
Minimum thickness of semi-conducting XLPE on conductor	0.30					
Insulation thickness – minimum average – minimum at a point	 mm mm	 3.4 2.96				
Approximate diameter over insulation	mm	14.3	15.4	16.7	18.0	19.9
Minimum thickness of semi-conducting XLPE on insulation	mm	0.30				
Approximate thickness of semi-conducting tape	mm	0.4				
Metallic Screen – nominal cross sectional area – copper tapes, no and dimensions	 mm² No x mm x mm	 ≥ 16 2 x 25 x 0.35			 ≥ 16 2 x 30 x 0.30	
Approximate thickness of inner covering	mm	1.0				
Nominal dia of wires of bare copper braid	mm	0.3				
Outer sheath thickness – nominal – minimum at a point	 mm mm	 1.7 1.16	 1.7 1.16	 1.8 1.24	 1.8 1.24	 1.9 1.32
Approximate overall diameter of complete cable (D)	mm	25.4	26.4	27.9	29.1	31.2
Approximate weight of complete cable	kg/km	1 113	1 247	1 435	1 641	1 957
DELIVERY DATA						
Length per drum ± 5%	m	1 000				
Diameter and max. width of wooden drum, type	m x m	1.60 x 1.06 16	1.60 x 1.06 16	1.60 x 1.06 16	1.60 x 1.06 16	1.80 x 1.07 18
Approximate weight of heaviest reel including cable	kg	1 346	1 480	1 668	1 874	2 298
MECHANICAL DATA						
Recommended minimum bending radius for laying	m	0.38	0.40	0.42	0.44	0.47
Maximum permissible pulling force with a pulling eye on conductor	 kN	 1.25	 1.75	 2.50	 3.50	 4.75
ELECTRICAL DATA						
Maximum DC phase conductor resistance at 20 °C Maximum AC phase conductor resistance at 90 °C	Ω/km Ω/km	0.727 0.927	0.524 0.668	0.387 0.496	0.268 0.345	0.193 0.249
SHORT CIRCUIT CURRENTS						
Maximum permissible thermal short-circuit current for 1 sec. Phase conductor from 90 °C to 250 °C Metallic screen from 70 °C to 350 °C	 kA kA	 3.6 3.7	 5.0 3.7	 7.2 3.7	 10.0 3.7	 13.6 3.7
AMPACITY, in free air, ambient temperature 45 °C, acc. to IEC 60092-352 Table V						
Trefoil or Flat formation and touching Flat formation and spaced	A A	120 140	150 175	185 210	240 275	290 333

DESCRIPTION	UNIT	DETAILS				
Number and nominal cross-section of the conductors	No x mm²/mm²	1x120/16	1x150/25	1x185/25	1x240/25	1x300/25
CONSTRUCTION DATA						
Phase copper round conductor – nominal cross sectional area – number of wires – diameter and tolerance	 mm² No mm	 120 36 12.9$^{+0.25}$	 150 36 14.5$^{+0.3}$	 185 36 16.0$^{+0.3}$	 240 60 18.5$^{+0.3}$	 300 58 20.5$^{+0.3}$
Minimum thickness of semi-conducting XLPE on conductor	mm	0.30				
Insulation thickness – minimum average – minimum at a point	 mm mm	3.4 2.96				
Approximate diameter over insulation	mm	21.4	23.0	24.5	27.0	29.0
Minimum thickness of semi-conducting XLPE on insulation	mm	0.30				
Approximate thickness of semi-conducting tape	mm	0.4				
Metallic Screen – nominal cross sectional area – copper tapes, no. and dimensions	 mm² No x mm x mm	 ≥ 16 2x30x0.30	 ≥ 25 2x40x0.35			
Approximate thickness of inner covering	mm	1.0	1.2			
Nominal dia. of wires of bare copper braid	mm	0.3		0.4		
Outer sheath thickness – nominal – minimum at a point	 mm mm	 1.9 1.32	 2.0 1.40	 2.1 1.48	 2.2 1.56	 2.3 1.64
Approximate overall diameter of complete cable (D)	mm	32.6	35.1	37.2	39.9	42.1
Approximate weight of complete cable	kg/km	2272	2703	3217	3865	4528
DELIVERY DATA						
Length per drum ± 5%	m	1000				
Diameter and max. width of wooden drum – type	mxm	1.80 x 1.07 18	2.00 x 1.09 20	2.00 x 1.09 20A	2.20 x 1.34 22	2.20 x 1.34 22
Approximate weight of heaviest reel including cable	kg	2583	3145	3626	4481	5144
MECHANICAL DATA						
Recommended minimum bending radius for laying	m	0.49	0.53	0.56	0.60	0.63
Maximum permissible pulling force with a pulling eye on conductor	kN	6.00	7.50	9.25	12.0	15.0
ELECTRICAL DATA						
Maximum DC phase conductor resistance at 20°C Maximum AC phase conductor resistance at 90°C	Ω/km Ω/km	0.153 0.198	0.124 0.163	0.0991 0.1310	0.0754 0.1010	0.0601 0.0830
SHORT CIRCUIT CURRENTS						
Maximum permissible thermal short-circuit current for 1 sec. Phase conductor from 90°C to 250°C Metallic screen from 70°C to 350°C	 kA kA	 17.2 3.7	 21.5 5.3	 26.5 5.3	 34.3 5.3	 42.9 5.3
AMPACITY, in free air, ambient temperature 45°C, acc. to IEC 60092-352 Table V						
Trefoil or Flat formation and touching Flat formation and spaced	A A	340 390	390 450	445 515	530 615	515 710

MVEPRHXCuHX Marine Cables 6/10 (12) kV

Single and three core EPR Insulated Polyolefin jacketed Marine cable

Standard: IEC60228, IEC60092-350, IEC60092-354, IEC60332 Cat. A, IEC60754-1 I 2, IEC61034	
CONSTRUCTION	
Conductors:	Annealed stranded bare copper Class 2 in accordance IEC60228
Conductor shield:	Semi-conducting tape layer between the conductor and insulation
Insulation	Ethylene-propylene rubber type E90 to 3.22 UL 1309
Insulation shield:	Semi-conducting layer + bare copper tape
Inner covering	Polyolefin
Armouring:	Bare copper braid
Jacket:	Polyolefin thermosetting compound
Colour of jacket:	Red
TECHNICAL DATA	
Maximum conductor operating temperature: +90°C	
Temperature range: - 15°C to + 50°C	
Application	For fixed installations on board of ships at all levels and open decks
Standard length cable packing	500 m on drums Other forms of packing are available on request
Approvals	ABS, RMRS

Size mm²	Cable diameter			Approx. Weight kg/km
	Minimum mm	Approx. mm	Maximum mm	
1x25	21.95	23.30	24.00	947
1x35	22.50	24.40	25.50	1085
1x50	23.50	25.80	26.50	1262
1x70	25.00	27.30	28.00	1516
1x95	27.00	29.40	30.00	1850
1x120	28.50	30.90	32.00	2142
1x150	30.50	33.10	33.50	2512
1x185	32.00	34.80	36.00	2919
1x240	35.00	37.90	38.50	3644
1x300	37.00	39.80	41.00	4291
3x25	42.00	45.50	46.50	3263
3x35	44.50	47.90	49.50	3744
3x50	47.00	51.00	51.50	4377
3x70	50.50	54.10	56.00	5262
3x95	54.50	59.10	60.00	6511
3x120	58.50	62.40	64.50	7529
3x150	61.50	66.20	67.50	8717

Size mm²	Standing	Conductor Diameter mm	Thickness of semi-con. tape+layer over conductor mm	Thickness of insulation mm	Thickness of semi-con +Cover insulation mm	Diameter over ins and screens Outside of cable mm	Inner covering thickness= mm	Thickness of conc. screen (Cu wires mm	Cable sheath thickness mm
1x25	7x2.13	6.10	0.2+0.7	3.4	0.8+0.127	16.70	1.0	0.3	1.6
1x35	7x2.52	7.15	0.2+0.7	3.4	0.8+0.127	17.70	1.0	0.3	1.6
1x50	19x1.84	8.45	0.2+0.7	3.4	0.8+0.127	19.00	1.0	0.3	1.7
1x70	14x2.55	9.80	0.2+0.7	3.4	0.8+0.127	20.40	1.0	0.3	1.8
1x95	19x2.55	11.75	0.2+0.7	3.4	0.8+0.127	22.30	1.0	0.3	1.8
1x120	19x2.87	13.15	0.2+0.7	3.4	0.8+0.127	23.70	1.0	0.3	1.9
1x150	19x3.20	14.80	0.2+0.7	3.4	0.8+0.127	25.40	1.2	0.3	2.0
1x185	37x2.55	16.30	0.2+0.7	3.4	0.8+0.127	26.90	1.2	0.3	2.0
1x240	37x2.87	18.80	0.2+0.7	3.4	0.8+0.127	29.40	1.2	0.4	2.1
1x300	46x3.02	20.60	0.2+0.7	3.4	0.8+0.127	31.20	1.2	0.4	2.2
3x25	7x2.13	6.10	0.2+0.7	3.4	0.8+0.127	16.70	1.4	0.4	2.4
3x35	7x2.52	7.15	0.2+0.7	3.4	0.8+0.127	17.70	1.4	0.4	2.5
3x50	19x1.84	8.45	0.2+0.7	3.4	0.8+0.127	19.00	1.4	0.4	2.6
3x70	19x2.10	10.51	0.2+0.7	3.4	0.8+0.127	20.40	1.4	0.4	2.7
3x95	19x2.55	11.75	0.2+0.7	3.4	0.8+0.127	22.30	1.6	0.4	2.9
3x120	19x2.87	13.15	0.2+0.7	3.4	0.8+0.127	23.70	1.6	0.4	3.1
3x150	19x3.20	14.80	0.2+0.7	3.4	0.8+0.127	25.40	1.6	0.4	3.2

MVEPRHXCuHX 8.7/15 (17.5) kV 2000V

Single and three core EPR Insulated Polyolefin jacketed Marine cable

Standard: IEC60228, IEC60092-350, IEC60092-354, IEC60332 Cat. A, IEC60754-1 I 2, IEC61034	
CONSTRUCTION	
Conductors:	Annealed stranded bare copper Class 2 in accordance IEC60228
Conductor Shield:	Semi-conducting tape layer between the conductor and insulation
Insulation	Ethylene-propylene rubber type E90 to 3.22 UL 1309
Insulation shield:	Semi-conducting layer + bare copper tape
Inner covering	Polyolefin
Armouring:	Bare copper braid
Jacket:	Polyolefin thermosetting compound
Color of jacket:	Red
TECHNICAL DATA	
Maximum conductor operating temperature: +90°C	
Temperature range: - 15°C to + 50°C	
Application	For fixed installations on board of ships at all levels and open decks
Standard length cable packing	500 m on drums Other forms of packing are available on request
Approvals	ABS, RINA

Size mm²	Średnica zewnętrzna			Approx. Weight kg/km
	Minimum mm	Approx. mm	Maximum mm	
1x25	23.5	25.5	26.5	1035
1x35	25.0	26.8	28.0	1186
1x50	26.0	28.0	29.0	1384
1x70	27.5	30.2	30.5	1639
1x95	29.5	31.5	32.5	1969
1x120	31.5	33.5	35.0	2305
1x150	33.0	35.3	36.5	2666
1x185	35.0	36.8	39.0	3148
1x240	38.0	40.0	42.0	3835
1x300	40.0	43.8	44.0	4485
3x25	47.5	49.1	52.0	3905
3x35	49.5	50.3	54.5	4438
3x50	52.0	52.8	57.0	5108
3x70	56.0	56.2	61.5	6175
3x95	59.5	63.8	65.5	7325
3x120	63.5	67.3	69.5	8505
3x150	66.5	71.1	73.5	9744
3x185	69.5	74.4	78.0	11150
3x240	79.0	83.5	87.5	13936

Size mm²	Standing	Conductor Diameter mm	Thickness of semi-con. tape+layer over conductor mm	Thickness of insulation mm	Thickness of semi-con +Cover insulation mm	Diameter over ins and screens Diameter of cable mm	Inner covering thickness= mm	Thickness of conc. screen Cu wires mm	Cable sheat thickness mm
1x25	7x2.13	6.10	0.2+0.7	4.5	0.8+0.127	18.80	1.0	0.3	1.7
1x35	7x2.52	7.15	0.2+0.7	4.5	0.8+0.127	19.85	1.0	0.3	1.8
1x50	19x1.84	8.45	0.2+0.7	4.5	0.8+0.127	21.15	1.0	0.3	1.8
1x70	19x2.10	10.51	0.2+0.7	4.5	0.8+0.127	23.20	1.0	0.3	1.8
1x95	19x2.55	11.75	0.2+0.7	4.5	0.8+0.127	24.45	1.0	0.3	1.9
1x120	19x2.87	13.15	0.2+0.7	4.5	0.8+0.127	25.85	1.2	0.3	2.0
1x150	19x3.20	14.80	0.2+0.7	4.5	0.8+0.127	27.50	1.2	0.3	2.1
1x185	37x2.55	16.30	0.2+0.7	4.5	0.8+0.127	29.00	1.2	0.3	2.1
1x240	37x2.87	18.80	0.2+0.7	4.5	0.8+0.127	31.50	1.2	0.4	2.2
1x300	61x2.48	22.26	0.2+0.7	4.5	0.8+0.127	35.00	1.2	0.4	2.4
3x25	7x2.13	6.10	0.2+0.7	4.5	0.8+0.127	40.60	1.4	0.4	2.6
3x35	7x2.52	7.15	0.2+0.7	4.5	0.8+0.127	42.90	1.4	0.4	2.7
3x50	19x1.84	8.45	0.2+0.7	4.5	0.8+0.127	45.70	1.6	0.4	2.8
3x70	19x2.10	10.51	0.2+0.7	4.5	0.8+0.127	50.20	1.6	0.4	3.0
3x95	19x2.55	11.75	0.2+0.7	4.5	0.8+0.127	52.80	1.6	0.4	3.1
3x120	19x2.87	13.15	0.2+0.7	4.5	0.8+0.127	55.90	1.6	0.4	3.3
3x150	19x3.20	14.80	0.2+0.7	4.5	0.8+0.127	59.40	1.6	0.4	3.4
3x185	37x2.55	16.00	0.2+0.7	4.5	0.8+0.127	62.00	1.8	0.4	3.5
3x240	61x2.21	19.90	0.2+0.7	4.5	0.8+0.127	70.40	1.8	0.4	3.8

TFKable

More than just a cable supplier

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FlameBlocker NTKOXSekw 150/250V (300V)

Halogen-free low smoke shipboard instrumentation, control and telecommunications cables	
Standard: IEC 60092-376	
CONSTRUCTION	
Conductors	Circular stranded bare or tinned copper class 2 or class 5 acc. to IEC 60228
Insulation	Cross-linked polyethylene HF-XLPE 90°C acc. to IEC 60092-351
Inner covering	Lapped with non-hygroscopic tape
Armour (screen)	Copper wire braiding with the metallic contact with a copper drain wire (optional)
Sheath	Thermoplastic halogen free polyolefin compound type SHF1 acc. to IEC 60092-359
Colour of Sheath	Grey, black or blue
Core identification	White with black printed numbers
Pair identification	core a: blue (or black) core b: white with printed pair number
Triple identification	core a: blue core b: white core c: red with printed triple number
	Other suitable colour codes may be used
TECHNICAL DATA	
Maximum conductor operating temperature: +90°C	
Lowest ambient temperature for fixed installation: -40°C	
Lowest installation temperature: -15°C	
Maximum short-circuit conductor temperature: +250°C	
Minimum bending radius	6 x D (D is the overall diameter of the cable)
Flame retardant	IEC 60332-3-22 Category A
Smoke emission	IEC 61034-2
Gases evolved during combustion	IEC 60754-1: < 5 mg/g acid gas IEC 60754-2: pH ≥ 4,3; conductivity ≤ 10 µS/mm[1]
Application	Cables are designed for interconnection of all sorts of instrumentation and communication equipment including that telephone equipment whose proper functioning is necessary for the safety of the ship
Standard length / cable packing	500 or 1000 m on drums. Other forms of packing are available on request
Approvals	GL, DNV, LR, RINA, CLASSNK, BV

Multi-pairs cable with tape bedding

Number and cross-sectional area of conductor	Number of wires in conductor class 2	Nominal thickness of insulation	Thickness of tape	Diameter of wires in bunching	Nominal thickness of sheath	Overall diameter			Approximate net weight of cables
						Min.	Nom.	Max.	
n x mm²	n	mm	mm	mm	mm	mm			kg/km
1x2x0,5 RM	7	0,4	0,1	0,20	1,00	6,4	6,8	7,8	72
2x2x0,5 RM*	7	0,4	0,1	0,20	1,00	7,0	7,6	8,6	94
3x2x0,5 RM	7	0,4	0,1	0,20	1,10	9,0	9,7	11,0	126
4x2x0,5 RM	7	0,4	0,1	0,20	1,10	9,6	10,4	11,5	148
7x2x0,5 RM	7	0,4	0,1	0,20	1,20	11,0	12,3	13,5	211
10x2x0,5 RM	7	0,4	0,1	0,30	1,30	14,5	15,7	17,5	330
12x2x0,5 RM	7	0,4	0,1	0,30	1,30	15,0	16,2	18,0	358
14x2x0,5 RM	7	0,4	0,1	0,30	1,30	15,5	16,9	18,5	388
16x2x0,5 RM	7	0,4	0,1	0,30	1,40	16,5	17,9	19,5	444
19x2x0,5 RM	7	0,4	0,1	0,30	1,40	17,5	18,8	20,5	488
24x2x0,5 RM	7	0,4	0,1	0,30	1,50	20,0	21,8	24,0	599
37x2x0,5 RM	7	0,4	0,1	0,30	1,60	23,0	24,8	27,0	839
1x3x0,5 RM	7	0,4	0,1	0,20	1,00	6,6	7,1	8,0	79
3x3x0,5 RM	7	0,4	0,1	0,20	1,10	9,8	10,6	12,0	155
7x3x0,5 RM	7	0,4	0,1	0,20	1,20	12,5	13,5	15,0	265
12x3x0,5 RM	7	0,4	0,1	0,30	1,40	16,5	18,1	20,0	471
1x2x0,75 RM	7	0,5	0,1	0,20	1,00	7,2	7,6	8,8	89
2x2x0,75 RM*	7	0,5	0,1	0,20	1,00	8,0	8,5	9,8	112
3x2x0,75 RM	7	0,5	0,1	0,20	1,10	10,5	11,1	13,0	164
4x2x0,75 RM	7	0,5	0,1	0,20	1,20	11,5	12,2	14,0	199
5x2x0,75 RM	7	0,5	0,1	0,20	1,20	12,5	13,1	15,0	226
7x2x0,75 RM	7	0,5	0,1	0,20	1,20	13,5	14,2	16,5	277
8x2x0,75 RM	7	0,5	0,1	0,30	1,30	15,5	16,4	18,5	358
10x2x0,75 RM	7	0,5	0,1	0,30	1,40	17,5	18,5	21,0	435
12x2x0,75 RM	7	0,5	0,1	0,30	1,40	18,0	19,0	21,5	476
14x2x0,75 RM	7	0,5	0,1	0,30	1,40	19,0	19,9	22,5	536
16x2x0,75 RM	7	0,5	0,1	0,30	1,50	20,0	21,1	24,0	590
19x2x0,75 RM	7	0,5	0,1	0,30	1,50	21,0	22,2	25,0	671
20x2x0,75 RM	7	0,5	0,1	0,30	1,60	22,5	23,5	26,5	710
24x2x0,75 RM	7	0,5	0,1	0,30	1,70	25,0	26,0	29,5	841
37x2x0,75 RM	7	0,5	0,1	0,30	1,80	28,5	29,7	33,5	1151
1x3x0,75 RM	7	0,5	0,1	0,20	1,00	7,6	8,0	9,2	100
3x3x0,75 RM	7	0,5	0,1	0,20	1,20	11,5	12,4	14,0	212
6x3x0,75 RM	7	0,5	0,1	0,30	1,30	15,5	16,3	18,5	377
7x3x0,75 RM	7	0,5	0,1	0,30	1,30	15,5	16,3	18,5	404
12x3x0,75 RM	7	0,5	0,1	0,30	1,50	20,5	21,3	24,5	629

Number and cross-sectional area of conductor	Number of wires in conductor class 2	Nominal thickness of insulation	Thickness of tape	Diameter of wires in braiding	Nominal thickness of sheath	Overall diameter			Approximate net weight of cables
						Min.	Nom.	Max.	
n x mm²	n	mm	mm	mm	mm	mm			kg/km
1x2x1 RM	7	0,50	0,1	0,20	1,00	7,2	8,0	9,0	98
2x2x1 RM*	7	0,50	0,1	0,20	1,10	8,4	9,1	10,5	137
3x2x1 RM	7	0,50	0,1	0,20	1,10	10,5	11,7	13,0	186
4x2x1 RM	7	0,50	0,1	0,20	1,20	11,5	12,9	14,5	229
7x2x1 RM	7	0,50	0,1	0,30	1,30	14,5	15,7	17,5	374
10x2x1 RM	7	0,50	0,1	0,30	1,40	18,0	19,7	22,0	516
12x2x1 RM	7	0,50	0,1	0,30	1,40	18,5	20,3	22,5	568
14x2x1 RM	7	0,50	0,1	0,30	1,50	19,5	21,4	23,5	632
19x2x1 RM	7	0,50	0,1	0,30	1,60	21,5	23,8	26,0	797
24x2x1 RM	7	0,50	0,1	0,30	1,70	25,5	27,8	30,5	987
37x2x1 RM	7	0,50	0,1	0,30	1,80	29,0	31,7	34,5	1370
1x3x1 RM	7	0,50	0,1	0,20	1,00	7,6	8,3	9,4	112
3x3x1 RM	7	0,50	0,1	0,20	1,20	12,0	13,1	14,5	242
7x3x1 RM	7	0,50	0,1	0,30	1,30	16,0	17,4	19,5	486
12x3x1 RM	7	0,50	0,1	0,30	1,50	20,5	22,8	25,0	755
1x2x1,5 RM	7	0,60	0,1	0,20	1,00	8,2	9,0	10,0	120
2x2x1,5 RM*	7	0,60	0,1	0,20	1,10	9,6	10,3	11,5	172
3x2x1,5 RM	7	0,60	0,1	0,20	1,20	12,5	13,6	15,0	252
4x2x1,5 RM	7	0,60	0,1	0,30	1,30	14,0	15,5	17,0	348
5x2x1,5 RM	7	0,60	0,1	0,30	1,30	15,5	16,8	18,5	392
7x2x1,5 RM	7	0,60	0,1	0,30	1,40	17,0	18,3	20,5	497
8x2x1,5 RM	7	0,60	0,1	0,30	1,50	19,0	20,6	22,5	575
10x2x1,5 RM	7	0,60	0,1	0,30	1,60	21,5	23,3	25,5	694
12x2x1,5 RM	7	0,60	0,1	0,30	1,60	22,0	24,0	26,5	770
14x2x1,5 RM	7	0,60	0,1	0,30	1,60	23,0	25,2	27,5	876
16x2x1,5 RM	7	0,60	0,1	0,30	1,70	24,5	26,7	29,5	970
19x2x1,5 RM	7	0,60	0,1	0,30	1,70	26,0	28,0	30,5	1088
20x2x1,5 RM	7	0,60	0,1	0,30	1,80	27,5	29,8	32,5	1176
24x2x1,5 RM	7	0,60	0,1	0,30	1,90	30,5	33,0	36,0	1388
37x2x1,5 RM	7	0,60	0,1	0,30	2,10	35,0	38,0	41,5	1952

Number and cross-sectional area of conductors	Number of wires in conductor class 2	Nominal thickness of insulation	Thickness of tape	Diameter of wires in braiding	Nominal thickness of sheath	Overall diameter			Approximate net weight of cables
						Min.	Nom.	Max.	
n x mm²	n	mm	mm	mm	mm	mm			kg/km
1x3x1,5 RM	7	0,60	0,1	0,20	1,10	8,8	9,6	11,0	144
2x3x1,5 RM	7	0,60	0,1	0,20	1,10	13,0	14,0	15,5	266
3x3x1,5 RM	7	0,60	0,1	0,30	1,30	14,5	15,7	17,5	367
4x3x1,5 RM	7	0,60	0,1	0,30	1,30	15,5	17,1	19,0	446
7x3x1,5 RM	7	0,60	0,1	0,30	1,50	19,0	20,5	22,5	662
8x3x1,5 RM	7	0,60	0,1	0,30	1,50	21,0	22,9	25,0	751
12x3x1,5 RM	7	0,60	0,1	0,30	1,70	25,0	27,0	29,5	1043
16x3x1,5 RM	7	0,60	0,1	0,30	1,80	27,5	30,0	33,0	1320
2x2x2,5 RM*	7	0,60	0,1	0,20	1,10	10,5	11,4	13,0	224
* Cables 2 pairs are assembler as a quad.									

Multi-cores cable with tape bedding

Number and cross-sectional area of conductors	Number of wires in conductor class 2	Nominal thickness of insulation	Thickness of tape	Diameter of wires in braiding	Nominal thickness of sheath	Overall diameter			Approximate net weight of cables
						Min.	Nom.	Max.	
n x mm²	n	mm	mm	mm	mm	mm			kg/km
2x0,75 RM	7	0,51	0,1	0,20	1,00	7,2	7,6	8,8	89
3x0,75 RM	7	0,51	0,1	0,20	1,00	7,6	8,0	9,2	100
4x0,75 RM	7	0,51	0,1	0,20	1,00	8,0	8,5	9,8	112
5x0,75 RM	7	0,51	0,1	0,20	1,10	8,8	9,3	11,0	135
7x0,75 RM	7	0,51	0,1	0,20	1,10	9,4	9,9	11,5	161
10x0,75 RM	7	0,51	0,1	0,20	1,20	11,5	12,2	14,0	217
12x0,75 RM	7	0,51	0,1	0,20	1,20	12,0	12,6	14,5	240
14x0,75 RM	7	0,51	0,1	0,20	1,20	12,5	13,1	15,0	262
16x0,75 RM	7	0,51	0,1	0,20	1,20	13,0	13,7	15,5	294
19x0,75 RM	7	0,51	0,1	0,20	1,20	13,5	14,4	16,5	323
24x0,75 RM	7	0,51	0,1	0,30	1,30	16,0	17,1	19,5	454
27x0,75 RM	7	0,51	0,1	0,30	1,40	16,5	17,6	20,0	492
32x0,75 RM	7	0,51	0,1	0,30	1,40	18,0	18,8	21,5	548
37x0,75 RM	7	0,51	0,1	0,30	1,40	18,5	19,4	22,0	597
8x1,5 RM	7	0,61	0,1	0,20	1,20	12,0	13,4	15,0	278

FlameBlocker NTKOXSekw IB 150/250V (300V)

Halogen-free low smoke shipboard instrumentation, control and telecommunications cables	
Standard: IEC 60092-376	
CONSTRUCTION	
Conductors	Circular stranded bare or tinned copper class 2 or class 5 acc. to IEC 60228
Insulation	Cross-linked polyethylene HF-XLPE 90°C acc. to IEC 60092-351
Inner covering	Lapped with non-hygroscopic tape
Armour (screen)	Copper wire braiding with the metallic contact with a copper drain wire (optional)
Sheath	Thermoplastic halogen free polyolefin compound type SHF1 acc. to IEC 60092-359
Colour of Sheath	Blue
Core identification	White with black printed numbers
Pair identification	core a: blue (or black) core b: white with printed pair number
Triple identification	core a: blue core b: white core c: red with printed triple number
	Other suitable colour codes may be used
TECHNICAL DATA	
Maximum conductor operating temperature: +90°C	
Lowest ambient temperature for fixed installation: -40°C	
Lowest installation temperature: -15°C	
Maximum short-circuit conductor temperature: +250°C	
Minimum bending radius	6 x D (D is the overall diameter of the cable)
Flame retardant	IEC 60332-3-22 Category A
Smoke emission	IEC 61034-2
Gases evolved during combustion	IEC 60754-1: < 5 mg/g acid gas IEC 60754-2: pH ≥ 4,3; conductivity ≤ 10 µS/mm[1]
Application	Cables are designed for interconnection of all sorts of instrumentation and communication equipment including that telephone equipment whose proper functioning is necessary for the safety of the ship
Standard length / cable packing	500 or 1000 m on drums. Other forms of packing are available on request
Approvals	GL, DNV, LR, RINA, CLASSNK, BV

Multi-pairs cable with inner bedding (IB)

Number and cross-sectional area of conductor	Number of wires in conductor class 2	Nominal thickness of insulation	Thickness of inner bedding	Diameter of wires in braiding	Nominal thickness of sheath	Overall diameter			Approximate net weight of cables
						Min.	Nom.	Max.	
n x mm²	n	mm	mm	mm	mm		mm		kg/km
1x2x0,5 RM	7	0,4	1,0	0,20	1,0	8,2	8,6	9,8	119
2x2x0,5 RM*	7	0,4	1,0	0,20	1,1	9,2	9,5	11,0	142
3x2x0,5 RM	7	0,4	1,0	0,20	1,1	11,0	11,4	13,0	184
4x2x0,5 RM	7	0,4	1,0	0,20	1,2	11,5	12,4	14,0	219
7x2x0,5 RM	7	0,4	1,0	0,20	1,2	13,0	14,0	16,0	284
10x2x0,5 RM	7	0,4	1,0	0,30	1,4	16,5	17,7	19,5	435
12x2x0,5 RM	7	0,4	1,0	0,30	1,4	17,0	18,1	20,0	466
14x2x0,5 RM	7	0,4	1,0	0,30	1,4	17,5	18,8	21,0	501
19x2x0,5 RM	7	0,4	1,0	0,30	1,5	19,5	20,7	23,0	611
24x2x0,5 RM	7	0,4	1,0	0,30	1,6	22,5	23,7	26,0	737
37x2x0,5 RM	7	0,4	1,0	0,30	1,7	25,0	26,7	29,5	958
1x3x0,5 RM	7	0,4	1,0	0,20	1,1	8,6	9,1	10,5	130
3x3x0,5 RM	7	0,4	1,0	0,20	1,2	12,0	12,5	14,0	230
7x3x0,5 RM	7	0,4	1,0	0,30	1,3	15,0	15,9	18,0	394
12x3x0,5 RM	7	0,4	1,0	0,30	1,4	18,5	19,8	22,0	578
1x2x0,75 RM	7	0,5	1,0	0,20	1,1	9,4	9,6	11,0	142
2x2x0,75 RM*	7	0,5	1,0	0,20	1,1	10,0	10,5	12,0	173
3x2x0,75 RM	7	0,5	1,0	0,20	1,2	12,5	13,0	15,0	235
4x2x0,75 RM	7	0,5	1,0	0,20	1,2	13,5	13,9	16,0	271
7x2x0,75 RM	7	0,5	1,0	0,30	1,3	16,0	16,6	19,0	405
8x2x0,75 RM	7	0,5	1,0	0,30	1,4	17,5	18,3	21,0	468
10x2x0,75 RM	7	0,5	1,0	0,30	1,5	19,5	20,4	23,5	559
12x2x0,75 RM	7	0,5	1,0	0,30	1,5	20,0	21,0	24,0	604
14x2x0,75 RM	7	0,5	1,0	0,30	1,5	21,0	21,9	25,0	654
16x2x0,75 RM	7	0,5	1,0	0,30	1,6	22,0	23,1	26,5	732
19x2x0,75 RM	7	0,5	1,0	0,30	1,6	23,0	24,1	27,5	801
20x2x0,75 RM	7	0,5	1,0	0,30	1,6	24,5	25,2	28,5	857
24x2x0,75 RM	7	0,5	1,0	0,30	1,7	27,0	27,8	31,5	978
37x2x0,75 RM	7	0,5	1,0	0,30	1,9	30,5	31,6	36,0	1296
1x3x0,75 RM	7	0,5	1,0	0,20	1,1	9,6	9,9	11,5	157
3x3x0,75 RM	7	0,5	1,0	0,30	1,3	14,0	14,8	17,0	323
7x3x0,75 RM	7	0,5	1,0	0,30	1,4	17,5	18,3	21,0	514
12x3x0,75 RM	7	0,5	1,0	0,30	1,6	22,5	23,3	26,5	769
1x2x1 RM	7	0,5	1,0	0,20	1,1	9,4	9,9	11,5	160
2x2x1 RM*	7	0,5	1,0	0,20	1,1	10,0	10,9	12,5	196
3x2x1 RM	7	0,5	1,0	0,20	1,2	12,5	13,7	15,5	269
4x2x1 RM	7	0,5	1,0	0,30	1,3	14,0	15,3	17,5	366

Number and cross-sectional area of conductors	Number of wires in conductor class 2	Nominal thickness of insulation	Thickness of inner bedding	Diameter of wires in braiding	Nominal thickness of sheath	Overall diameter			Approximate net weight of cables
						Min.	Nom.	Max.	
n x mm²	n	mm	mm	mm	mm		mm		kg/km
7x2x1 RM	7	0,5	1,0	0,30	1,4	16,5	17,7	20,0	483
10x2x1 RM	7	0,5	1,0	0,30	1,5	20,0	21,6	24,0	632
12x2x1 RM	7	0,5	1,0	0,30	1,5	20,5	22,2	24,5	706
14x2x1 RM	7	0,5	1,0	0,30	1,5	21,5	23,2	25,5	768
19x2x1 RM	7	0,5	1,0	0,30	1,6	23,5	25,6	28,5	953
24x2x1 RM	7	0,5	1,0	0,30	1,8	27,5	29,7	33,0	1176
37x2x1 RM	7	0,5	1,0	0,30	1,9	31,0	33,7	37,0	1550
1x3x1 RM	7	0,5	1,0	0,20	1,1	9,8	10,3	12,0	173
3x3x1 RM	7	0,5	1,0	0,30	1,3	14,5	15,5	17,5	377
7x3x1 RM	7	0,5	1,0	0,30	1,4	18,0	19,3	21,5	586
12x3x1 RM	7	0,5	1,0	0,30	1,6	23,0	24,7	27,5	914
1x2x1,5 RM	7	0,6	1,0	0,20	1,1	10,0	10,9	12,5	192
2x2x1,5 RM*	7	0,6	1,0	0,20	1,2	11,5	12,3	14,0	247
3x2x1,5 RM	7	0,6	1,0	0,30	1,3	15,0	16,0	18,0	360
4x2x1,5 RM	7	0,6	1,0	0,30	1,4	16,5	17,4	19,5	455
7x2x1,5 RM	7	0,6	1,0	0,30	1,5	19,0	20,3	22,5	626
8x2x1,5 RM	7	0,6	1,0	0,30	1,5	21,0	22,3	25,0	705
10x2x1,5 RM	7	0,6	1,0	0,30	1,6	23,5	25,0	27,5	862
12x2x1,5 RM	7	0,6	1,0	0,30	1,6	24,0	25,8	28,5	935
14x2x1,5 RM	7	0,6	1,0	0,30	1,7	25,5	27,1	30,0	1036
16x2x1,5 RM	7	0,6	1,0	0,30	1,7	26,5	28,4	31,5	1151
19x2x1,5 RM	7	0,6	1,0	0,30	1,8	28,0	30,0	33,0	1290
20x2x1,5 RM	7	0,6	1,0	0,30	1,8	29,5	31,5	34,5	1341
24x2x1,5 RM	7	0,6	1,2	0,30	2,0	33,0	35,4	39,0	1623
37x2x1,5 RM	7	0,6	1,2	0,40	2,2	38,0	40,8	44,5	2290
1x3x1,5 RM	7	0,6	1,0	0,20	1,1	10,5	11,4	13,0	211
2x3x1,5 RM	7	0,6	1,0	0,20	1,1	14,5	15,8	18,0	334
3x3x1,5 RM	7	0,6	1,0	0,30	1,4	16,5	17,7	20,0	485
4x3x1,5 RM	7	0,6	1,0	0,30	1,4	18,0	19,0	21,5	552
7x3x1,5 RM	7	0,6	1,0	0,30	1,5	21,0	22,3	25,0	793
8x3x1,5 RM	7	0,6	1,0	0,30	1,6	23,0	24,8	27,5	922
12x3x1,5 RM	7	0,6	1,0	0,30	1,8	27,0	28,9	32,0	1234
16x3x1,5 RM	7	0,6	1,0	0,30	1,9	30,0	32,0	35,0	1507
2x2x2,5 RM*	7	0,6	1,0	0,20	1,2	12,5	13,3	15,0	306

* Cables 2 pairs are assembler as a quad.

FlameBlocker NTKOXSekwf 150/250V (300V)

Halogen-free low smoke shipboard instrumentation, control and telecommunications cables, collectively screened	
Standard: IEC60092-376	
CONSTRUCTION	
Conductors	Circular stranded bare or tinned copper class 2 or class 5 acc. to IEC60228
Insulation	Cross-linked polyethylene HFXLPE 90°C acc. to IEC60092-351
Inner covering	Lapped with non-hygroscopic tape
Collective screen	Of aluminium/polyester tape with the metallic contact with a tinned copper drain wire
Sheath	Thermoplastic halogen free polyolefin compound type SHF1 acc. to IEC60092-359
Colour of Sheath	Grey, black or blue
Core identification	White with black printed numbers
Pair identification	core a: blue (or black) core b: white with printed pair number
	Other suitable colour codes may be used
TECHNICAL DATA	
Maximum conductor operating temperature: +90°C	
Lowest ambient temperature for fixed installation: -40°C	
Lowest installation temperature: -15°C	
Minimum bending Radius	6xD (D is the overall diameter of the cable)
Flame retardant	IEC60332-3-22 Category A
Smoke emission	IEC61034-2
Gases evolved during combustion	IEC60754-1: < 5 mg/g acid gas IEC60754-2: pH ≥ 4,3; conductivity ≤ 10 µS/mm[1]
Application	Cables are designed for interconnection of all sorts of instrumentation and communication equipment including that telephone equipment whose proper functioning is necessary for the safety of the ship
Standard length cable packing	500 or 1000 m on drums. Other forms of packing are available on request
Approvals	DNV

Multipair, conductor class 2

Number and cross-sectional area of conductor	Number of wires in conductor class 2 Min.	Nominal thickness of insulation Nom.	Thickness of tape Max.	Nominal thickness of sheat	Overall diameter			Approximate net weight of cables
					Min.	Nom.	Max.	
n x mm²	n	mm	mm	mm		mm		kg/km
1x2x0,5	7	0,4	0,1	1,0	5,4	6,2	6,6	45
2x2x0,5*	7	0,4	0,1	1,0	6,0	7,0	7,4	63
4x2x0,5	7	0,4	0,1	1,1	8,6	10,0	10,5	109
7x2x0,5	7	0,4	0,1	1,1	10,0	11,7	12,5	159
10x2x0,5	7	0,4	0,1	1,2	13,0	14,8	15,5	223
12x2x0,5	7	0,4	0,1	1,2	13,5	15,3	16,0	252
14x2x0,5	7	0,4	0,1	1,3	14,0	16,3	17,0	290
19x2x0,5	7	0,4	0,1	1,3	15,5	18,0	19,0	367
24x2x0,5	7	0,4	0,1	1,4	18,5	21,2	22,0	463
37x2x0,5	7	0,4	0,1	1,5	21,5	24,3	25,5	665
1x2x0,75	7	0,5	0,1	1,0	6,2	7,0	7,8	57
2x2x0,75*	7	0,5	0,1	1,0	7,0	7,9	8,8	82
4x2x0,75	7	0,5	0,1	1,1	10,5	11,5	12,5	144
7x2x0,75	7	0,5	0,1	1,2	12,5	13,8	15,0	221
8x2x0,75	7	0,5	0,1	1,3	14,0	15,6	17,0	258
10x2x0,75	7	0,5	0,1	1,3	16,0	17,6	19,5	310
12x2x0,75	7	0,5	0,1	1,4	16,5	18,4	20,0	361
14x2x0,75	7	0,5	0,1	1,4	17,5	19,3	21,0	406
19x2x0,75	7	0,5	0,1	1,5	19,5	21,6	23,5	527
20x2x0,75	7	0,5	0,1	1,5	21,0	22,8	25,0	556
24x2x0,75	7	0,5	0,1	1,6	23,0	25,4	27,5	664
37x2x0,75	7	0,5	0,1	1,7	26,5	29,2	32,0	955
1x2x1,5	7	0,6	0,1	1,0	7,2	8,3	9,0	84
2x2x1,5*	7	0,6	0,1	1,1	8,6	9,7	10,5	132
4x2x1,5	7	0,6	0,1	1,2	12,5	14,4	15,5	237
7x2x1,5	7	0,6	0,1	1,3	15,0	17,3	18,5	371
8x2x1,5	7	0,6	0,1	1,4	17,5	19,6	21,0	432
10x2x1,5	7	0,6	0,1	1,5	20,0	22,4	24,0	534
12x2x1,5	7	0,6	0,1	1,5	20,5	23,1	24,5	612
14x2x1,5	7	0,6	0,1	1,6	21,5	24,5	26,0	705
16x2x1,5	7	0,6	0,1	1,6	23,0	25,8	27,5	788
19x2x1,5	7	0,6	0,1	1,7	24,5	27,4	29,0	921
20x2x1,5	7	0,6	0,1	1,7	26,0	29,0	31,0	971
24x2x1,5	7	0,6	0,1	1,8	29,0	32,3	34,5	1159
37x2x1,5	7	0,6	0,1	2,0	33,5	37,4	39,5	1706

* Cables 2 pairs are assembler as a quad.

Multicore, conductor class 2

Number and cross-sectional area of conductor	Number of wires in conductor class 2	Nominal thickness of insulation	Thickness of tape Min.	Nominal thickness of sheath Nom.	Overall diameter			Approximate net weight of cables
					Min.	Nom.	Max.	
n x mm²	n	mm	mm	mm		mm		kg/km
2x0,75	7	0,5	0,1	1,0	6,2	7,0	7,8	57
3x0,75	7	0,5	0,1	1,0	6,6	7,4	8,2	68
4x0,75	7	0,5	0,1	1,0	7,0	7,9	8,8	81
5x0,75	7	0,5	0,1	1,0	7,6	8,5	9,4	96
6x0,75	7	0,5	0,1	1,0	8,2	9,2	10,0	111
7x0,75	7	0,5	0,1	1,0	8,2	9,2	10,0	117
10x0,75	7	0,5	0,1	1,1	10,5	11,6	13,0	163
12x0,75	7	0,5	0,1	1,1	10,5	11,9	13,0	184
14x0,75	7	0,5	0,1	1,2	11,5	12,7	14,0	213
16x0,75	7	0,5	0,1	1,2	12,0	13,3	14,5	238
18x0,75	7	0,5	0,1	1,2	12,5	14,0	15,5	263
19x0,75	7	0,5	0,1	1,2	12,5	14,0	15,5	269
24x0,75	7	0,5	0,1	1,3	15,0	16,4	18,0	339
25x0,75	7	0,5	0,1	1,3	15,0	16,4	18,0	348
27x0,75	7	0,5	0,1	1,3	15,0	16,7	18,5	369
32x0,75	7	0,5	0,1	1,3	16,0	17,9	19,5	427
37x0,75	7	0,5	0,1	1,4	17,0	18,8	20,5	486

Multicore, conductor class 5

Number and cross-sectional area of conductor	Maximum diameter of wires in conductor class 5 Min.	Nominal thickness of insulation Nom.	Thickness of tape Min.	Nominal thickness of sheath	Overall diameter			Approximate net weight of cables
					Min.	Nom.	Max.	
n x mm²	n	mm	mm	mm		mm		kg/km
1x2x0,5	0,21	0,4	0,1	1,0	5,4	6,2	6,6	45
2x2x0,5*	0,21	0,4	0,1	1,0	6,0	7,0	7,4	62
4x2x0,5	0,21	0,4	0,1	1,1	8,6	10,0	10,5	108
7x2x0,5	0,21	0,4	0,1	1,1	10,0	11,7	12,5	156
10x2x0,5	0,21	0,4	0,1	1,2	13,0	14,9	15,5	219
12x2x0,5	0,21	0,4	0,1	1,2	13,5	15,4	16,0	247
14x2x0,5	0,21	0,4	0,1	1,3	14,0	16,3	17,0	284
19x2x0,5	0,21	0,4	0,1	1,3	15,5	18,1	19,0	359
24x2x0,5	0,21	0,4	0,1	1,4	18,5	21,2	22,0	453
37x2x0,5	0,21	0,4	0,1	1,5	21,5	24,4	25,5	649
1x2x0,75	0,21	0,5	0,1	1,0	6,2	7,1	7,8	57
2x2x0,75*	0,21	0,5	0,1	1,0	7,0	8,1	8,8	82
4x2x0,75	0,21	0,5	0,1	1,1	10,5	11,8	12,5	145

Number and cross-sectional area of conductor	Maximum diameter of wires in conductor class 5 Min.	Nominal thickness of insulation Nom.	Thickness of tape Min.	Nominal thickness of sheath	Overall diameter			Approximate net weight of cables
					Min.	Nom.	Max.	
n x mm²	n	mm	mm	mm		mm		kg/km
7x2x0,75	0,21	0,5	0,1	1,2	12,5	14,1	15,0	221
8x2x0,75	0,21	0,5	0,1	1,3	14,0	16,0	17,0	258
10x2x0,75	0,21	0,5	0,1	1,3	16,0	18,0	19,5	310
12x2x0,75	0,21	0,5	0,1	1,4	16,5	18,8	20,0	360
14x2x0,75	0,21	0,5	0,1	1,4	17,5	19,8	21,0	405
19x2x0,75	0,21	0,5	0,1	1,5	19,5	22,2	23,5	525
20x2x0,75	0,21	0,5	0,1	1,5	21,0	23,4	25,0	554
24x2x0,75	0,21	0,5	0,1	1,6	23,0	26,1	27,5	661
37x2x0,75	0,21	0,5	0,1	1,7	26,5	30,0	32,0	949
1x2x1,5	0,26	0,6	0,1	1,0	7,2	8,2	9,0	80
2x2x1,5*	0,26	0,6	0,1	1,1	8,6	9,6	10,5	126
4x2x1,5	0,26	0,6	0,1	1,2	12,5	14,1	15,5	225
7x2x1,5	0,26	0,6	0,1	1,3	15,0	17,0	18,5	350
8x2x1,5	0,26	0,6	0,1	1,4	17,5	19,3	21,0	407
10x2x1,5	0,26	0,6	0,1	1,5	20,0	22,0	24,0	504
12x2x1,5	0,26	0,6	0,1	1,5	20,5	22,7	24,5	576
14x2x1,5	0,26	0,6	0,1	1,6	21,5	24,1	26,0	663
16x2x1,5	0,26	0,6	0,1	1,6	23,0	25,4	27,5	741
19x2x1,5	0,26	0,6	0,1	1,7	24,5	27,0	29,0	864
20x2x1,5	0,26	0,6	0,1	1,7	26,0	28,5	31,0	912
24x2x1,5	0,26	0,6	0,1	1,8	29,0	31,8	34,5	1088
37x2x1,5	0,26	0,6	0,1	2,0	33,5	36,8	39,5	1597
* Cables 2 pairs are assembler as a quad.								

Multicore, conductor class 5

Number and cross-sectional area of conductor	Maximum diameter of wires in conductor class 5	Nominal thickness of insulation	Thickness of tape Min.	Nominal thickness of sheath	Overall diameter			Approximate net weight of cables
					Min.	Nom.	Max.	
n x mm²	n	mm	mm	mm		mm		kg/km
2x0,75	0,21	0,5	0,1	1,0	6,2	7,1	7,8	57
3x0,75	0,21	0,5	0,1	1,0	6,6	7,5	8,2	69
4x0,75	0,21	0,5	0,1	1,0	7,0	8,1	8,8	81
5x0,75	0,21	0,5	0,1	1,0	7,6	8,7	9,4	96
6x0,75	0,21	0,5	0,1	1,0	8,2	9,4	10,0	112
7x0,75	0,21	0,5	0,1	1,0	8,2	9,4	10,0	117
10x0,75	0,21	0,5	0,1	1,1	10,5	11,9	13,0	163
12x0,75	0,21	0,5	0,1	1,1	10,5	12,2	13,0	184
14x0,75	0,21	0,5	0,1	1,2	11,5	13,0	14,0	212
16x0,75	0,21	0,5	0,1	1,2	12,0	13,6	14,5	237
18x0,75	0,21	0,5	0,1	1,2	12,5	14,3	15,5	262
19x0,75	0,21	0,5	0,1	1,2	12,5	14,3	15,5	268
24x0,75	0,21	0,5	0,1	1,3	15,0	16,8	18,0	337
25x0,75	0,21	0,5	0,1	1,3	15,0	16,8	18,0	347
27x0,75	0,21	0,5	0,1	1,3	15,0	17,1	18,5	368
32x0,75	0,21	0,5	0,1	1,3	16,0	18,4	19,5	425
37x0,75	0,21	0,5	0,1	1,4	17,0	19,2	20,5	483

FlameBlocker NTKOXSekf/ekw 150/250V (300V)

Halogen-free low smoke shipboard instrumentation, control and telecommunications cables	
Standard: IEC60092-376	
CONSTRUCTION	
Conductors	Circular stranded copper class 2 acc. to IEC60228
Insulation	Cross-linked polyethylene HFFR XLPE 90°C acc. to IEC60092-351
Individually pair/screen	Of aluminium/polyester tape with the metallic contact with a tinned copper drain wire
Inner covering	Lapped with non-hygroscopic tape
Armour (screen)	Copper wire braiding with the metallic contact with a copper drain wire
Sheath	Thermoplastic halogen free polyolefin compound type SHF1 acc. to IEC60092-359
Colour of Sheath	Grey, black or blue
Pair identification	core a: blue (or black) core b: white with printed pair number
Triple identification	core a: blue core b: white core c: red with printed triple number
	Other suitable colour codes may be used
TECHNICAL DATA	
Maximum conductor operating temperature: +90°C	
Lowest ambient temperature for fixed installation: -40°C	
Lowest installation temperature: -15°C	
Maximum short-circuit conductor temperature: +250°C	
Minimum bending radius	6xD (D is the overall diameter of the cable)
Flame retardant	IEC60332-3-22 Category A/F
Smoke emission	IEC61034-2
Gases evolved during combustion	IEC60754-1: < 5 mg/g acid gas IEC60754-2: pH ≥ 4,3; conductivity ≤ 10 µS/mm[1]
Application	Cables are designed for control and instrumentation circuits on ships and offshore units They are intended for fixed installations. This is especially designed for installations on passenger ships
Standard length/cable packing	500 or 1000 m on drums. Other forms of packing are available on request
Approvals	ABS, CLASSNK, DNV, GL, LR, RMRS

Multi-pairs cable with tape bedding

Number and cross-sectional area of conductor	Number of wires in conductor class 2	Nominal thickness of insulation	Thickness of tape	Diameter of wires in bunching	Nominal thickness of sheath	Overall diameter			Approximate net weight of cables
						Min.	Nom.	Max.	
n x mm²	n	mm	mm		mm		mm		kg/km
1x2x0,75RM	7	0,5	0,1	0,20	1,0	7,2	8,2	8,8	97
2x2x0,75RM	7	0,5	0,1	0,20	1,1	10,5	12,2	13,0	172
3x2x0,75RM	7	0,5	0,1	0,20	1,2	11,0	13,1	13,5	208
4x2x0,75RM	7	0,5	0,1	0,20	1,2	12,0	14,2	15,0	249
5x2x0,75RM	7	0,5	0,1	0,20	1,2	13,0	15,4	16,0	290
7x2x0,75RM	7	0,5	0,1	0,30	1,3	15,0	17,3	18,0	413
10x2x0,75RM	7	0,5	0,1	0,30	1,4	18,5	21,8	22,5	549
12x2x0,75RM	7	0,5	0,1	0,30	1,5	19,5	22,7	23,5	634
14x2x0,75RM	7	0,5	0,1	0,30	1,5	20,5	23,8	24,5	695
16x2x0,75RM	7	0,5	0,1	0,30	1,5	21,5	25,0	25,5	783
17x2x0,75RM	7	0,5	0,1	0,30	1,6	22,5	26,5	27,0	832
19x2x0,75RM	7	0,5	0,1	0,30	1,6	22,5	26,5	27,0	884
24x2x0,75RM	7	0,5	0,1	0,30	1,7	26,5	31,0	31,5	1091
37x2x0,75RM	7	0,5	0,1	0,30	1,9	30,5	35,7	36,0	1556
1x3x0,75RM	7	0,5	0,1	0,20	1,0	7,6	8,6	9,2	114
3x3x0,75RM	7	0,5	0,1	0,20	1,4	12,5	14,7	15,5	267
7x3x0,75RM	7	0,5	0,1	0,30	1,4	16,5	19,3	20,0	504
12x3x0,75RM	7	0,5	0,1	0,30	1,5	21,5	25,1	25,5	799
16x3x0,75RM	7	0,5	0,1	0,30	1,6	24,0	28,0	28,5	978
1x2x1,5RM	7	0,6	0,1	0,20	1,0	8,2	9,6	10,0	131
2x2x1,5RM	7	0,6	0,1	0,20	1,2	12,5	14,8	15,5	241
3x2x1,5RM	7	0,6	0,1	0,20	1,2	13,0	15,6	16,0	300
4x2x1,5RM	7	0,6	0,1	0,30	1,3	15,0	17,7	18,5	418
7x2x1,5RM	7	0,6	0,1	0,30	1,4	18,0	21,1	21,5	604
8x2x1,5RM	7	0,6	0,1	0,30	1,5	20,0	23,8	24,0	696
10x2x1,5RM	7	0,6	0,1	0,30	1,6	23,0	27,0	27,5	850
12x2x1,5RM	7	0,6	0,1	0,30	1,6	23,5	27,9	28,0	949
14x2x1,5RM	7	0,6	0,1	0,30	1,7	25,0	29,4	29,5	1092
19x2x1,5RM	7	0,6	0,1	0,30	1,8	28,0	32,9	33,0	1391
24x2x1,5RM	7	0,6	0,1	0,30	2,0	33,0	38,7	39,0	1734
27x2x1,5RM	7	0,6	0,1	0,30	2,0	33,5	39,6	39,5	1913
1x3x1,5RM	7	0,6	0,1	0,20	1,1	8,8	10,2	11,0	162
2x3x1,5RM	7	0,6	0,1	0,30	1,3	14,5	16,9	17,5	361
3x3x1,5RM	7	0,6	0,1	0,30	1,3	15,5	17,9	18,5	429
4x3x1,5RM	7	0,6	0,1	0,30	1,4	17,0	19,7	20,5	532
7x3x1,5RM	7	0,6	0,1	0,30	1,5	20,0	23,6	24,0	780
8x3x1,5RM	7	0,6	0,1	0,30	1,6	22,5	26,6	27,0	904
12x3x1,5RM	7	0,6	0,1	0,30	1,7	26,5	31,2	31,5	1241
24x3x1,5RM	7	0,6	0,1	0,40	2,1	37,5	43,9	44,0	2414

FlameBlocker NTKOXSekf/ekw IB 150/250V (300V)

Halogen-free low smoke shipboard instrumentation, control and telecommunications cables	
Standard: IEC60092-376	
CONSTRUCTION	
Conductors	Circular stranded copper class 2 acc. to IEC60228
Insulation	Cross-linked polyethylene HF-XLPE 90°C acc. to IEC60092-351
Individually pair screen	Of aluminium/polyester tape with the metallic contact with a tinned copper drain wire
Inner covering	Extruded inner bedding of special flame-retardant and halogen-free compound
Armour (screen)	Copper wire braiding with the metallic contact with a copper drain wire
Sheath	Thermoplastic halogen free polyolefin compound type SHF1 acc. to IEC60092-359
Colour of Sheath	grey, black or blue
Pair identification	core a: blue (or black) core b: white with printed pair number
Triple identification	core a: blue core b: white core c: red with printed triple number
	Other suitable colour codes may be used
TECHNICAL DATA	
Maximum conductor operating temperature: +90°C	
Lowest ambient temperature for fixed installation: -40°C	
Lowest installation temperature: -15°C	
Maximum short-circuit conductor temperature: +250°C	
Minimum bending radius	6 x D (D is the overall diameter of the cable)
Flame retardant	IEC60332-3-22 Category A/F
Smoke emission	IEC61034-2
Gases evolved during combustion	IEC60754-1: < 5 mg/g acid gas IEC60754-2: pH ≥ 4,3; conductivity ≤ 10 µS/mm[1]
Application	Cables are designed for control and instrumentation circuits on ships and offshore units They are intended for fixed installations. This is especially designed for installations on passenger ships
Standard length / cable packing	500 or 1000 m on drums. Other forms of packing are available on request
Approvals	ABS, CLASSNK, DNV, GL, LR, RMRS

Multi-pairs cable with extruded inner covering (IB)

Number and cross-sectional area of conductor	Number of wires in conductor class 2	Nominal thickness of insulation	Thickness of inner covering	Diameter of wires in braiding	Nominal thickness of sheath	Overall diameter			Approximate net weight of cables
						Min.	Nom.	Max.	
n x mm²	n	mm	mm		mm		mm		kg/km
1x2x0,75RM	7	0,5	1,0	0,20	1,00	7,2	7,6	8,8	89
2x2x0,75RM	7	0,5	1,0	0,20	1,00	8,0	8,5	9,8	112
3x2x0,75RM	7	0,5	1,0	0,20	1,10	10,5	11,1	13,0	164
4x2x0,75RM	7	0,5	1,0	0,20	1,20	11,5	12,2	14,0	199
5x2x0,75RM	7	0,5	1,0	0,20	1,20	13,5	14,2	16,5	277
8x2x0,75RM	7	0,5	1,0	0,30	1,30	15,5	16,4	18,5	358
10x2x0,75RM	7	0,5	1,0	0,30	1,40	17,5	18,5	21,0	435
12x2x0,75RM	7	0,5	1,0	0,30	1,40	18,0	19,0	21,5	476
14x2x0,75RM	7	0,5	1,0	0,30	1,40	19,0	19,9	22,5	536
16x2x0,75RM	7	0,5	1,0	0,30	1,50	20,0	21,1	24,0	590
19x2x0,75RM	7	0,5	1,0	0,30	1,50	21,0	22,2	25,0	671
20x2x0,75RM	7	0,5	1,0	0,30	1,60	22,5	23,5	26,5	710
24x2x0,75RM	7	0,5	1,0	0,30	1,70	25,0	26,0	29,5	841
37x2x0,75RM	7	0,5	1,0	0,30	1,80	28,5	29,7	33,5	1151
1x3x0,75RM	7	0,5	1,0	0,20	1,00	7,6	8,0	9,2	100
3x3x0,75RM	7	0,5	1,0	0,20	1,20	11,5	12,4	14,0	212
7x3x0,75RM	7	0,5	1,0	0,30	1,30	15,5	16,3	18,5	404
12x3x0,75RM	7	0,5	1,0	0,30	1,50	20,5	21,3	24,5	629
1x2x1,5RM	7	0,6	1,0	0,20	1,1	10,0	11,5	12,5	190
2x2x1,5RM	7	0,6	1,0	0,30	1,3	15,0	17,1	18,0	400
3x2x1,5RM	7	0,6	1,0	0,30	1,3	16,0	18,0	19,0	451
4x2x1,5RM	7	0,6	1,0	0,30	1,4	17,0	19,6	20,5	540
7x2x1,5RM	7	0,6	1,0	0,30	1,5	20,0	23,0	24,0	744
8x2x1,5RM	7	0,6	1,0	0,30	1,6	22,5	25,7	26,5	860
10x2x1,5RM	7	0,6	1,0	0,30	1,7	25,0	28,9	29,5	1042
12x2x1,5RM	7	0,6	1,0	0,30	1,7	26,0	29,8	30,5	1142
14x2x1,5RM	7	0,6	1,0	0,30	1,8	27,0	31,3	32,0	1267
19x2x1,5RM	7	0,6	1,0	0,30	1,9	30,0	34,8	35,5	1586
24x2x1,5RM	7	0,6	1,2	0,40	2,1	36,0	41,5	42,0	2123
1x3x1,5RM	7	0,6	1,0	0,20	1,1	10,5	11,9	13,0	218
2x3x1,5RM	7	0,6	1,0	0,30	1,4	16,5	18,8	20,0	463
3x3x1,5RM	7	0,6	1,0	0,30	1,4	17,5	19,8	21,0	553
4x3x1,5RM	7	0,6	1,0	0,30	1,4	19,0	21,4	22,5	636
7x3x1,5RM	7	0,6	1,0	0,30	1,6	22,0	25,5	26,5	942
8x3x1,5RM	7	0,6	1,0	0,30	1,7	24,5	28,5	29,5	1083
12x3x1,5RM	7	0,6	1,0	0,30	1,8	28,5	33,1	34,0	1452
24x3x1,5RM	7	0,6	1,2	0,40	2,2	40,0	46,2	47,0	2717

FlameBlocker NTKOXSekf/ekwf 150/250V (300V)

Halogen-free low smoke shipboard instrumentation and control cables, individually and collectively screeened	
Standard: IEC60092-376	
CONSTRUCTION	
Conductors	Circular stranded bare or tinned copper class 2 or class 5 acc. to IEC60228
Insulation	Cross-linked polyethylene HFXLPE 90°C acc. to IEC60092-351
Individually pairs screen	Al aluminium/polyester tape with the metallic contact with a tinned copper drain wire
Inner covering	Lapped with non-hygroscopic tape
Collective screen	Al aluminium/polyester tape with the metallic contact with a tinned copper drain wire
Sheat	Thermoplastic halogen free polyolefin compound type SHF1 acc. to IEC60092-359
Colour of Sheat	grey, black or blue
Pair identification	core a: blue (or black) core b: white with printed pair number
	Other suitable colour codes may be used
TECHNICAL DATA	
Maximum conductor operating temperature: +90°C	
Lowest ambient temperature for fixed installation: -40°C	
Lowest installation temperature: -15°C	
Minimum bending radius	6xD (D is the overall diameter of the cable)
Flame retardant	IEC60332-3-22 Category A
Smoke emission	IEC61034-2
Gases evolved during combustion	IEC60754-1: < 5 mg/g acid gas IEC60754-2: pH ≥ 4,3; conductivity ≤ 10 µS/mm[1]
Application	Cables are designed for control and instrumentation circuits on ships and offshore units. They are intended for fixed installations. This is especially designed for installations on passenger ships
Standard length cable packing	500 or 1000 m on drums. Other forms of packing are available on request
Approvals	DNV

Conductor class 2

Number and cross-sectional area of conductor	Number of wires in conductor class 2	Nominal thickness of insulation	Thickness of tape	Nominal thickness of sheat	Overall diameter			Approximate net weight of cables
					Min.	Nom.	Max.	
n x mm²	n	mm	mm	mm	mm			kg/km
2x2x0,75 RM	7	0,5	0,1	1,1	9,6	11,0	12,0	113
4x2x0,75 RM	7	0,5	0,1	1,2	11,0	13,0	14,0	181
7x2x0,75 RM	7	0,5	0,1	1,2	13,0	15,4	16,0	273
10x2x0,75 RM	7	0,5	0,1	1,4	17,5	19,9	21,0	395
12x2x0,75 RM	7	0,5	0,1	1,4	18,0	20,5	21,5	451
14x2x0,75 RM	7	0,5	0,1	1,4	18,5	21,6	22,5	510
19x2x0,75 RM	7	0,5	0,1	1,5	21,0	24,2	25,0	668
24x2x0,75 RM	7	0,5	0,1	1,7	25,0	28,7	30,0	866

Conductor class 5

Number and cross-sectional area of conductor	Maximum diameter of wires in conductor class 5	Nominal thickness of insulation	Thickness of tape	Nominal thickness of sheat	Overall diameter			Approximate net weight of cables
					Min.	Nom.	Max.	
n x mm²	n	mm	mm	mm	mm			kg/km
2x2x0,75 RM	0,21	0,5	0,1	1,1	9,6	11,3	12,0	114
4x2x0,75 RM	0,21	0,5	0,1	1,2	11,0	13,2	14,0	181
7x2x0,75 RM	0,21	0,5	0,1	1,2	13,0	15,7	16,0	273
10x2x0,75 RM	0,21	0,5	0,1	1,4	17,5	20,3	21,0	395
12x2x0,75 RM	0,21	0,5	0,1	1,4	18,0	21,0	21,5	451
14x2x0,75 RM	0,21	0,5	0,1	1,4	18,5	22,1	22,5	509
19x2x0,75 RM	0,21	0,5	0,1	1,5	21,0	24,8	25,0	666
24x2x0,75 RM	0,21	0,5	0,1	1,7	25,0	29,4	30,0	854

FLAME-X 950 NTKOGsekwf 150/250V (300V)

Halogen-free low smoke fire resistant shipboard instrumentation, control and telecommunications cables	
Standard: IEC60092-376	
CONSTRUCTION	
Conductors	Circular stranded tinned copper class 5 acc. to IEC60228
Insulation	Special cross-linked compound HFS95 acc. to IEC60092-351
Inner covering	Lapped with non-hygroscopic tape
Collective screen	Of aluminium/polyester tape with the metallic contact with a tinned copper drain wire
Sheath	Thermoplastic halogen free polyolefin compound type SHF1 acc. to IEC60092-359
Color of Sheath	Red
Pair identification	Black and white
TECHNICAL DATA	
Maximum conductor operating temperature: +90°C	
Lowest ambient temperature for fixed installation: -40°C	
Lowest installation temperature: -15°C	
Minimum bending radius	6xD (D is the overall diameter of the cable)
Fire resistant	IEC60331-21
Flame retardant	IEC60332-3-22 Category A
Smoke emission	IEC61034-2
Gases evolved during combustion	IEC60754-1: < 5 mg/g acid gas IEC60754-2: pH ≥ 4,3; conductivity ≤ 10 µS/mm[1]
Application	Cables are designed for interconnection of all sorts of instrumentation and communication equipment whose proper functioning is necessary for the safety of the ship. This cable type is especially designed for installations on passenger ships
Standard length / cable packing	500 or 1000 m on drums. Other forms of packing are available on request

Number and cross-sectional area of conductors	Maximum diameter of wires in conductor cl. 5	Nominal thickness of insulation	Thickness of tape	Nominal thickness of sheath	Overall diameter			Approximate net weight of cables
					Min.	Nom.	Max.	
n x mm²	mm	mm	mm	mm	mm			kg/km
1x2x1	0,21	0,6	0,1	1,0	6,6	7,8	8,4	72

FLAME-X 950 NTKOGsekw 150/250V (300V)

Halogen-free low smoke fire resistant shipboard instrumentation, control and telecommunications cables

Standard: IEC60092-376		
CONSTRUCTION		
Conductors	Circular stranded bare or tinned copper class 2 acc. to IEC60228	
Insulation	Special cross-linked compound HFS95 acc. to IEC60092-351	
Inner covering	Lapped with tape or extruded bedding of special flame-retardant and halogen-free compound	
	Tape or inner bedding	
Armour (screen)	Copper wire braiding with the metallic contact with a copper drain wire	
Sheath	Thermoplastic halogen free compound type SHF1 acc. to IEC60092-359	
Colour of Sheath	Orange or grey	
Pair identification	starting pair: reference pair: uneven pair: even pair:	red, white blue, white black, white yellow, white
Triple identification	core a: blue core b: white core c: red	
Quad identification:	core a: blue core b: white	core c: red core d: black
TECHNICAL DATA		
Maximum conductor operating temperature: +90°C		
Lowest ambient temperature for fixed installation: -40°C		
Lowest installation temperature: -15°C		
Minimum bending radius	6xD (D is the overall diameter of the cable)	
Fire resistant	IEC60331-21: for cable diameters ≤ 20 mm; IEC60331-31: for cable diameters > 20 mm	
Flame retardant	IEC60332-3-22 Kategoria A/F	
Smoke emission	IEC61034-2	
Gases evolved during combustion	IEC60754-1: < 0,5% acid gas IEC60754-2 pH ≥ 4,3; conductivity ≤ 10 µS/mm[1]	
Application	Cables are designed for interconnection of all sorts of instrumentation and communication equipment including that telephone equipment whose proper functioning is necessary for the safety of the ship	
Standard length / cable packing	500 or 1000 m conductums. Other forms of packing are available on request	
Approvals	GL, DNV, LR, ABS, RINA, CLASSNK, BV	

Cable with tape bedding

Number and cross-sectional area of conductors	Number of wires in conductor class 2	Nominal thickness of insulation	Thickness of tape	Diameter of wires in braiding	Nominal thickness of sheath	Overall diameter			Approximate net weight of cables
						Min.	Nom.	Max.	
n x mm²	n	mm	mm	mm	mm		mm		kg/km
1x2x0,75	7	0,6	0,1	0,20	1,0	7,6	8,4	9,2	98
2x2x0,75*	7	0,6	0,1	0,20	1,1	8,6	9,6	10,5	138
3x2x0,75	7	0,6	0,1	0,20	1,2	11,0	12,6	13,5	201
4x2x0,75	7	0,6	0,1	0,20	1,2	12,0	13,7	15,0	239
7x2x0,75	7	0,6	0,1	0,30	1,3	15,0	16,7	18,0	377
10x2x0,75	7	0,6	0,1	0,30	1,4	19,0	21,0	22,5	520
12x2x0,75	7	0,6	0,1	0,30	1,5	19,5	21,9	23,5	582
14x2x0,75	7	0,6	0,1	0,30	1,5	20,5	22,9	24,5	654
19x2x0,75	7	0,6	0,1	0,30	1,6	23,0	25,5	27,0	828
20x2x0,75	7	0,6	0,1	0,30	1,6	24,0	26,8	28,5	863
24x2x0,75	7	0,6	0,1	0,30	1,7	26,5	29,8	31,5	1019
37x2x0,75	7	0,6	0,1	0,30	1,9	31,0	34,3	36,0	1417
1x3x0,75	7	0,6	0,1	0,20	1,0	8,0	8,8	9,6	117
1x4x0,75	7	0,6	0,1	0,20	1,1	8,6	9,6	10,5	138
2x2x1	7	0,6	0,1	0,20	1,0	7,6	8,7	9,4	113
2x2x1*	7	0,6	0,1	0,20	1,1	8,8	10,1	11,0	159
3x2x1	7	0,6	0,1	0,20	1,2	11,5	13,3	14,0	224
4x2x1	7	0,6	0,1	0,20	1,2	12,5	14,4	15,5	268
7x2x1	7	0,6	0,1	0,30	1,3	15,0	17,6	18,5	442
10x2x1	7	0,6	0,1	0,30	1,5	19,5	22,4	23,5	616
12x2x1	7	0,6	0,1	0,30	1,5	20,0	23,1	24,0	680
14x2x1	7	0,6	0,1	0,30	1,5	21,0	24,2	25,0	747
19x2x1	7	0,6	0,1	0,30	1,6	23,5	27,0	28,0	951
20x2x1	7	0,6	0,1	0,30	1,7	24,5	28,6	29,5	1032
24x2x1	7	0,6	0,1	0,30	1,8	27,5	31,7	33,0	1190
37x2x1	7	0,6	0,1	0,30	1,9	31,5	36,3	37,5	1679
1x3x1	7	0,6	0,1	0,20	1,0	8,0	9,2	9,8	129

Number and cross-sectional area of conductors	Number of wires in conductor class 2	Nominal thickness of insulation	Thickness of tape	Diameter of wires in braiding	Nominal thickness of sheath	Overall diameter			Approximate net weight of cables
						Min.	Nom.	Max.	
n x mm²	n	mm	mm	mm	mm		mm		kg/km
1x4x1	7	0,6	0,1	0,20	1,1	8,8	10,1	11,0	159
1x2x1,5	7	0,7	0,1	0,20	1,1	8,8	9,9	11,0	141
2x2x1,5*	7	0,7	0,1	0,20	1,1	10,0	11,2	12,0	197
3x2x1,5	7	0,7	0,1	0,30	1,3	14,0	15,6	16,5	334
4x2x1,5	7	0,7	0,1	0,30	1,3	15,0	17,0	18,0	385
7x2x1,5	7	0,7	0,1	0,30	1,4	18,0	20,2	21,5	576
8x2x1,5	7	0,7	0,1	0,30	1,5	20,0	22,7	24,0	664
10x2x1,5	7	0,7	0,1	0,30	1,6	22,5	25,8	27,0	809
12x2x1,5	7	0,7	0,1	0,30	1,6	23,5	26,6	28,0	900
14x2x1,5	7	0,7	0,1	0,30	1,7	25,0	28,1	29,5	1008
19x2x1,5	7	0,7	0,1	0,30	1,8	27,5	31,3	32,5	1286
20x2x1,5	7	0,7	0,1	0,30	1,8	29,0	33,0	34,5	1371
24x2x1,5	7	0,7	0,1	0,30	2,0	32,5	36,9	38,5	1633
37x2x1,5	7	0,7	0,1	0,40	2,2	38,0	42,9	44,5	2435
1x3x1,5	7	0,7	0,1	0,20	1,1	9,2	10,4	11,5	165
1x4x1,5	7	0,7	0,1	0,20	1,1	10,0	11,2	12,0	197
1x2x2,5	7	0,7	0,1	0,20	1,1	9,6	10,7	12,0	168

* Cables 2 pairs are assembler as a quad.

Cable with extruded inner bedding IB

Number and cross-sectional area of conductors	Number of wires in conductor class 2	Nominal thickness of insulation	Thickness of inner bedding	Diameter of wires in braiding	Nominal thickness of sheath	Overall diameter			Approximate net weight of cables
						Min.	Nom.	Max.	
n x n x mm²	n	mm	mm		mm		mm		kg/km
1 x 2 x 0,75	7	0,6	1,0	0,20	1,1	9,6	10,3	11,5	163
2 x 2 x 0,75*	7	0,6	1,0	0,20	1,1	10,5	11,4	12,5	200
3 x 2 x 0,75	7	0,6	1,0	0,20	1,2	13,0	14,4	16,0	274
4 x 2 x 0,75	7	0,6	1,0	0,30	1,3	15,0	16,1	17,5	362
7 x 2 x 0,75	7	0,6	1,0	0,30	1,4	17,0	18,7	20,5	491
10 x 2 x 0,75	7	0,6	1,0	0,30	1,5	21,0	23,0	25,0	661
12 x 2 x 0,75	7	0,6	1,0	0,30	1,5	21,5	23,6	25,5	718
14 x 2 x 0,75	7	0,6	1,0	0,30	1,6	22,5	24,8	26,5	818
19 x 2 x 0,75	7	0,6	1,0	0,30	1,7	25,0	27,4	29,5	979
20 x 2 x 0,75	7	0,6	1,0	0,30	1,7	26,0	28,8	31,0	1042
24 x 2 x 0,75	7	0,6	1,0	0,30	1,8	29,0	31,7	34,0	1192
37 x 2 x 0,75	7	0,6	1,2	0,30	2,0	33,5	36,6	39,0	1637
1 x 3 x 0,75	7	0,6	1,0	0,20	1,1	10,0	10,7	12,0	176
1 x 4 x 0,75	7	0,6	1,0	0,20	1,1	10,5	11,4	12,5	200
1 x 2 x 1	7	0,6	1,0	0,20	1,1	9,8	10,7	12,0	177
2 x 2 x 1*	7	0,6	1,0	0,20	1,1	10,5	11,8	13,0	220
3 x 2 x 1	7	0,6	1,0	0,30	1,3	14,0	15,7	17,0	355
4 x 2 x 1	7	0,6	1,0	0,30	1,3	15,0	16,8	18,0	397
7 x 2 x 1	7	0,6	1,0	0,30	1,4	17,5	19,5	21,0	546
10 x 2 x 1	7	0,6	1,0	0,30	1,5	21,5	24,1	25,5	738
12 x 2 x 1	7	0,6	1,0	0,30	1,6	22,0	25,0	26,5	846
14 x 2 x 1	7	0,6	1,0	0,30	1,6	23,0	26,1	27,5	921
19 x 2 x 1	7	0,6	1,0	0,30	1,7	25,5	28,9	30,5	1141
20 x 2 x 1	7	0,6	1,0	0,30	1,7	26,5	30,3	31,5	1184
24 x 2 x 1	7	0,6	1,0	0,30	1,8	29,5	33,5	35,0	1388
37 x 2 x 1	7	0,6	1,2	0,30	2,0	34,0	38,7	40,0	1884
1 x 3 x 1	7	0,6	1,0	0,20	1,1	10,0	11,1	12,5	197
1 x 4 x 1	7	0,6	1,0	0,20	1,1	10,5	11,8	13,0	220

Number and cross-sectional area of conductor	Number of wires in conductor class 2	Nominal thickness of insulation	Thickness of inner bedding	Diameter of wires in braiding	Nominal thickness of sheath	Overall diameter			Approximate net weight of cables
						Min.	Nom.	Max.	
nxnxmm²	n	mm	mm		mm		mm		kg/km
1x2x1,5	7	0,7	1,0	0,20	1,1	10,5	11,7	13,0	211
2x2x1,5*	7	0,7	1,0	0,20	1,2	12,0	13,2	14,5	277
3x2x1,5	7	0,7	1,0	0,30	1,3	16,0	17,4	19,0	436
4x2x1,5	7	0,7	1,0	0,30	1,4	17,0	18,9	20,5	503
7x2x1,5	7	0,7	1,0	0,30	1,5	20,0	22,1	23,5	718
8x2x1,5	7	0,7	1,0	0,30	1,6	22,0	24,7	26,0	827
10x2x1,5	7	0,7	1,0	0,30	1,7	25,0	27,7	29,5	970
12x2x1,5	7	0,7	1,0	0,30	1,7	25,5	28,5	30,0	1095
14x2x1,5	7	0,7	1,0	0,30	1,8	27,0	30,0	31,5	1215
19x2x1,5	7	0,7	1,0	0,30	1,9	30,0	33,3	35,0	1511
20x2x1,5	7	0,7	1,0	0,30	1,9	31,5	35,0	36,5	1570
24x2x1,5	7	0,7	1,2	0,30	2,1	35,0	39,3	41,0	1895
37x2x1,5	7	0,7	1,2	0,40	2,3	40,5	45,3	47,5	2675
1x3x1,5	7	0,7	1,0	0,20	1,2	11,5	12,4	13,5	246
1x4x1,5	7	0,7	1,0	0,20	1,2	12,0	13,2	14,5	277
1x2x2,5	7	0,7	1,0	0,20	1,2	11,5	12,7	14,0	263
* Cables 2 pairs are assembler as a quad									

657(*) (c) SW4 150/250V

TCu/ ePR/ CaM/ sW4

Shipboard instrumentation cables with elastomer insulated and sheathed, collectively screened	
Standard: BS6883	
CONSTRUCTION	
Conductors	Tinned annealed circular stranded copper class 5 or class 2 (optional) acc. to BS EN 60228
Insulation	Elastomer compound EPR type GP4 acc. to BS 7655-1.2
Forming	Core twisted together to form a pair, triple
Separator	Polyester tape
Collectively Screen	Of aluminium/polyester tape with the metallic contact with a tinned copper drain wire
Outer Sheat	Heat-resistant, oil-resisting and flame-retardant elastomer compound type SW4 acc. to BS 7655-2.6
Colour of Sheat	Grey or black
Pair Identification	Black and white with printed number of pairs in a contrasting colour on the insulation
Triples identification	Black, white and red with printed number of triples in a contrasting colour on the insulation
	Other suitable colour codes may be used
TECHNICAL DATA	
Maximum conductor operating temperature: +90°C	
Lowest ambient temperature for fixed installation: -40°C	
Lowest installation temperature: -15°C	
Minimum bending radius	8xD, D – overall diameter of cable
Flame retardant	BS EN 60332-3-22, IEC 60332-3-22 Category A
Smoke emission	BS EN 61034-2, IEC 61034-2
Corrosive gas emission	BS EN 50267-2-1, IEC 60754-1: type SW4 cables ≤ 0,5% acid gas
Application	For fixed installations in all areas and on open decks in ships Offshore Installations or Drilling Rigs and Platforms
Standard length cable packing	500 m on drums. Other forms of packing and delivery are available on request
Approvals	LR

Number of pairs, couples and nominal area of conductor	Class of conductor	Nominal thickness of insulation	Nominal thickness of external sheath	Approximate overall diameter of cable	Approximate net weight of cables SVV-1
n x 2 x mm²		mm	mm	mm	kg/km
1x2x0,75	5	0,8	1,0	7,9	80
3x2x0,75	5	0,8	1,2	13,9	196
7x2x0,75	5	0,8	1,4	18,8	386
12x2x0,75	5	0,8	1,6	24,4	635
20x2x0,75	5	0,8	1,9	31,1	1025
27x2x0,75	5	0,8	2,0	35,7	1341
37x2x0,75	5	0,8	2,2	41,4	1799
1x3x0,75	5	0,8	1,0	8,3	93
3x3x0,75	5	0,8	1,3	15,5	252
7x3x0,75	5	0,8	1,5	21,8	510
12x3x0,75	5	0,8	1,7	27,8	835
1x4x0,75	5	0,8	1,1	9,3	116
1x2x1	5	0,8	1,0	8,0	87
3x2x1	5	0,8	1,3	14,5	220
7x2x1	5	0,8	1,4	19,3	424
12x2x1	5	0,8	1,7	25,2	711
20x2x1	5	0,8	1,9	31,9	1131
27x2x1	5	0,8	2,1	36,8	1499
37x2x1	5	0,8	2,3	42,7	2011
1x3x1	5	0,8	1,1	8,7	105
3x3x1	5	0,8	1,3	15,9	277
7x3x1	5	0,8	1,5	22,4	565
12x3x1	5	0,8	1,8	28,7	942
1x4x1	5	0,8	1,1	9,5	127
1x2x1,5	5	0,8	1,3	9,3	115
1x4x1,5	5	0,8	1,4	10,8	169

657(*) (i) SW4 150/250V

TCu/ ePR/ laM/ sW4

Shipboard instrumentation cables with elastomer insulated and sheathed, individually screened pairs, triples, quads

Standard: BS6883	
CONSTRUCTION	
Conductors	Tinned annealed circular stranded copper class 5 or class 2 (optional) acc. to BS EN 60228
Insulation	Elastomer compound EPR type GP4 acc. to BS 7655-1.2
Forming	Core twisted together to form a pair, triple or quad
Separator	Polyester tape
Individual Screen	Of aluminium/polyester tape with the metallic contact with a tinned copper drain wire
Outer Sheath	Heat-resistant, oil-resisting and flame-retardant elastomer compound type SW4 acc. to BS 7655-2.6
Colour of Sheath	Grey or black
Pair Identification	Black and white with printed number of pairs in a contrasting colour on the insulation
Triples identification	Black, white and red with printed number of triples in a contrasting colour on the insulation
Quads identification:	Black, white, red and blue with printed number of quads in a contrasting colour on the insulation
	Other suitable colour codes may be used
TECHNICAL DATA	
Maximum conductor operating temperature: +90°C	
Lowest ambient temperature for fixed installation: -40°C	
Lowest installation temperature: -15°C	
Minimum bending radius	8 x D, D – overall diameter of cable
Flame retardant	BS EN 60332-3-22, IEC 60332-3-22 Category A
Smoke emission	BS EN 61034-2, IEC 61034-2
Corrosive gas emission	BS EN 50267-2-1, IEC 60754-1: ≤ 0,5% acid gas
Application	For fixed installations in all areas and on open deck in ships Offshore Installations or Drilling Rigs and Platforms
Standard length / cable packing	500 m on drums. Other forms of packing and delivery are available on request
Approvals	LR

Number of pairs, triples and nominal area of conductor	Class of conductor	Nominal thickness of insulation	Nominal thickness of outer sheath	Approximate overall diameter of cable	Approximate net weight of cables SVV4
nx2xmm²		mm	mm	mm	kg/km
1x2x0,75	5	0,8	1,0	7,9	80
3x2x0,75	5	0,8	1,2	13,9	196
7x2x0,75	5	0,8	1,4	18,8	386
12x2x0,75	5	0,8	1,6	24,4	635
20x2x0,75	5	0,8	1,9	31,1	1025
27x2x0,75	5	0,8	2,0	35,7	1341
37x2x0,75	5	0,8	2,2	41,4	1799
1x3x0,75	5	0,8	1,0	8,3	93
3x3x0,75	5	0,8	1,3	15,5	252
7x3x0,75	5	0,8	1,5	21,8	510
12x3x0,75	5	0,8	1,7	27,8	835
1x4x0,75	5	0,8	1,1	9,3	116
1x2x1	5	0,8	1,0	8,0	87
3x2x1	5	0,8	1,3	14,5	220
7x2x1	5	0,8	1,4	19,3	424
12x2x1	5	0,8	1,7	25,2	711
20x2x1	5	0,8	1,9	31,9	1131
27x2x1	5	0,8	2,1	36,8	1499
37x2x1	5	0,8	2,3	42,7	2011
1x3x1	5	0,8	1,1	8,7	105
3x3x1	5	0,8	1,3	15,9	277
7x3x1	5	0,8	1,5	22,4	565
12x3x1	5	0,8	1,8	28,7	942
1x4x1	5	0,8	1,1	9,5	127
1x2x1,5	5	0,8	1,3	9,3	115
1x4x1,5	5	0,8	1,4	10,8	169

658(*) (c) SW4150/250V

TCu/ ePR/ CaM/ sW4/ GsWb/ sW4

Shipboard instrumentation cables elastomer insulated and sheathed, collectively screened and wire braided

Standard: BS6883	
CONSTRUCTION	
Conductors	Tinned annealed circular stranded copper class 5 or class 2 (optional) acc. to BS EN 60228
Insulation	Elastomer compound EPR type GP4 acc. to BS 7655-1.2
Forming	Core twisted together to form a pair, triple
Separator	Polyester tape
Collective screen	Of aluminium/polyester tape with the metallic contact with a tinned copper drain wire
Inner Sheath	Heat-resistant, oil-resisting and flame-retardant elastomer compound type SW4 acc. to BS 7655-2.6
Braid	Of galvanized steel wire (optional braid of tinned copper wires)
Outer Sheath	Heat-resistant, oil-resisting and flame-retardant elastomer compound type SW4 acc. to BS 7655-2.6
Colour of Sheath	Grey, blue or black
Pair identification	Black and white with printed number of pairs in a contrasting colour on the insulation
Triples identification	Black, white and red with printed number of triples in a contrasting colour on the insulation
	Other suitable colour codes may be used
TECHNICAL DATA	
Maximum conductor operating temperature: +90°C	
Lowest ambient temperature for fixed installation: -40°C	
Lowest installation temperature: -15°C	
Minimum bending radius	8xD, D – overall diameter of cable
Flame retardant	BS EN 60332-3-22, IEC 60332-3-22 Category A
Smoke emission (SW4 cables only)	BS EN 61034-2, IEC 61034-2
Corrosive gas emission	BS EN 50267-2-1, IEC 60754-1: type SW4 cables ≤ 0,5% acid gas
Application	For fixed installations in all areas and on open deck in ships Offshore Installations or Drilling Rigs and Platforms
Standard length cable packing	500 m on drums. Other forms of packing and delivery are available on request
Approvals	LR

Number of pairs/ cores and nominal area of conductor	Class of conductor	Nominal thickness of insulation	Nominal thickness of inner sheat	Diameter of steel wires in braid	Nominal thickness of outer sheat	Approximate overall diameter of cable	Approximate net weight of cables SWA
nx2xmm²		mm	mm	mm	mm	mm	kg/km
2x2x0,75	5	0,8	1,2	0,30	1,4	13,7	292
3x2x0,75	5	0,8	1,2	0,30	1,4	17,1	383
4x2x0,75	5	0,8	1,4	0,30	1,5	18,9	468
5x2x0,75	5	0,8	1,4	0,30	1,5	20,2	514
6x2x0,75	5	0,8	1,4	0,30	1,5	21,6	575
7x2x0,75	5	0,8	1,4	0,30	1,5	21,6	602
10x2x0,75	5	0,8	1,6	0,30	1,7	25,9	826
12x2x0,75	5	0,8	1,6	0,30	1,7	26,8	884
14x2x0,75	5	0,8	1,8	0,45	2,0	30,0	1175
19x2x0,75	5	0,8	1,8	0,45	2,0	33,2	1382
20x2x0,75	5	0,8	1,8	0,45	2,0	33,8	1429
27x2x0,75	5	0,8	1,9	0,45	2,2	38,2	1793
37x2x0,75	5	0,8	2,1	0,45	2,3	43,5	2289
3x3x0,75	5	0,8	1,3	0,30	1,4	18,5	450
7x3x0,75	5	0,8	1,4	0,30	1,6	24,2	759
12x3x0,75	5	0,8	1,7	0,45	1,9	30,9	1284
3x2x1	5	0,8	1,2	0,30	1,4	17,4	403
5x2x1	5	0,8	1,4	0,30	1,6	20,8	555
7x2x1	5	0,8	1,4	0,30	1,6	22,2	654
10x2x1	5	0,8	1,6	0,30	1,8	26,7	888
12x2x1	5	0,8	1,6	0,30	1,8	27,7	984
20x2x1	5	0,8	1,8	0,45	2,1	34,8	1560
27x2x1	5	0,8	2,0	0,45	2,2	39,4	1963
30x2x1	5	0,8	2,2	0,45	2,4	41,7	2208
37x2x1	5	0,8	2,2	0,45	2,4	45,0	2516
3x3x1	5	0,8	1,3	0,30	1,5	19,0	487
7x3x1	5	0,8	1,5	0,30	1,7	25,2	847
12x3x1	5	0,8	1,7	0,45	2,0	31,8	1402

Number of pairs or triples and nominal area of conductor	Class of conductor	Nominal thickness of insulation	Nominal thickness of inner sheath	Diameter of steel wires in braid	Nominal thickness of outer sheath	Approximate overall diameter of cable	Approximate net weight of cables SW4
nx2xmm²		mm	mm	mm	mm	mm	kg/km
3x2x1,5	5	0,8	1,4	0,30	1,6	19,3	488
3x2x1,5	2	0,8	1,4	0,30	1,6	19,5	513
4x2x1,5	5	0,8	1,4	0,30	1,6	20,7	565
5x2x1,5	5	0,8	1,4	0,30	1,6	22,3	645
5x2x1,5	2	0,8	1,4	0,30	1,6	22,5	666
7x2x1,5	5	0,8	1,6	0,30	1,8	24,6	812
10x2x1,5	5	0,8	1,6	0,30	1,8	28,7	1052
10x2x1,5	2	0,8	1,6	0,30	1,8	29,0	1091
12x2x1,5	5	0,8	1,8	0,45	2,1	31,4	1351
12x2x1,5	2	0,8	1,8	0,45	2,1	31,8	1398
20x2x1,5	5	0,8	2,0	0,45	2,2	38,1	1923
20x2x1,5	2	0,8	2,0	0,45	2,2	38,6	1998
24x2x1,5	5	0,8	2,0	0,45	2,2	40,7	2197
30x2x1,5	2	0,8	2,1	0,45	2,4	45,4	2701
4x3x1,5	2	0,8	1,3	0,30	1,5	22,1	690
6x3x1,5	2	0,8	1,4	0,30	1,6	26,9	940
8x3x1,5	2	0,8	1,6	0,30	1,8	29,3	1173
12x3x1,5	5	0,8	1,7	0,45	1,9	34,0	1629
6x2x2,5	5	0,8	1,6	0,30	1,8	27,1	947
12x2x2,5	5	0,8	1,9	0,45	2,2	35,1	1703

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Installation

Cables on ships should be installed in accordance with requirements specified in IEC 60092-352 Standard.

Bending radius acc. to IEC 60092-352

Cable construction	Overall diameter of cable (D)	Minimum bending radius
unarmoured or unbraided	≤ 25 mm	4D
	> 25 mm	6D
Metal braid screened or armoured	Any	6D

Maximum pulling tension

Maximum pulling tension: 50 n x t r cr - cti c duct r

Current ratings

Curr t r ti g cc. t leC 60092-352 d m i t r t mp r t ur 45° C

Nominal cross-sectional area	Insulation class temperature 90°C		
	1-core	2-cores	3-cores & 4-cores
mm²	A	A	A
1	18	15	13
1.5	23	20	16
2.5	30	26	21
4	40	34	28
6	52	44	36
10	72	61	50
16	96	82	67
25	127	108	89
35	157	133	110
50	196	167	137
70	242	206	169
95	293	249	205
120	339	288	237
150	389	331	272
185	444	377	311
240	522	444	365
300	601	511	421

Current ratings for more than 4-core cables:

Number of cores	Insulation class temperature 90°C		
Nominal cross-sectional area of conductor	1 mm²	1,5 mm²	2,5 mm²
Current ratings	A		
5	10,5	12	16
7	9	10	15
10	8	9	13
12	8	9	12
16	7	8	11
19	7	7	10
20	7	7	10
24	6	6,5	9,5
27	6	6,5	9
30	6	6	9
37	5	6	8

Correction factors for different ambient air temperatures

The ambient temperature of 45° C, on which the current ratings are based, is considered to be a standard value for the ambient air temperature, generally applicable for any kind of ship and for navigation in any climate.

Correction factors for various ambient air temperatures

Maximum conductor temperature	90°C									
Ambient temperature, °C	35°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C	75°C	80°C
Correction factors	1,10	1,05	1,00	0,94	0,88	0,82	0,74	0,67	0,58	0,47

Correction factors for cable grouping

Where more than six bunched cables are contained in cable trays, in closed conduits, pipes or trunking are expected to operate simultaneously at full rated capacity, a correction factor of 0,85 should be applied.

Short circuit rating

short circuit rating calculation based on formula:

$$\text{short circuit current} = 226x\frac{s}{\sqrt{t}}x\sqrt{\ln\frac{234+T_k}{234+T_o}}$$

s = Cross-section of the conductor, mm²

t = Duration of the short circuit, s

T_k = Maximum rated conductor temperature, short circuit, ° C

T_o = Maximum rated conductor temperature, normal, ° C

Cross-section, mm²	1	1,5	2,5	4	6	10	16	25	35	50	70	95	120	150	185	240	300
Maximum short circuit current rating for 1s, in kA	0,14	0,21	0,35	0,57	0,85	1,43	2,29	3,57	5,01	7.15	10.0	13,6	17,1	21,4	26,4	34,3	42,9
Maximum short circuit current rating for 3s, in kA	0,08	0,12	0,21	0,33	0,50	0,82	1,32	2,06	2,89	4,13	5,78	7,85	9,91	12,3	15,3	19,8	24,8
Maximum short circuit current rating for 5s, in kA	0,06	0,10	0,16	0,26	0,38	0,64	1,02	1,60	2,2	3,20	4,48	6,08	7,68	9,60	11,8	15,3	19,2

for 0,6/ 1 kV cables and maximum conductor operating temperature +90° C, short circuit temperature up to 250° C.

electrical data

Cross-section of conductor	Conductor class 2				Conductor class 5			
	Bare copper		Tinned copper		Bare copper		Tinned copper	
	Maximum resistance at 20° r_{20}	Maximum resistance at 90°C r_{90}	Maximum resistance at 20°C r_{20}	Maximum resistance at 90°C r_{90}	Maximum resistance at 20° r_{20}	Maximum resistance at 90°C r_{90}	Maximum resistance at 20 r_{20}	Maximum resistance at 90°C r_{90}
mm²	Ω/km	Ω/km	Ω/km	Ω/km	Ω/km	Ω/km	Ω/km	Ω/km
1	18,1	23,1	18,2	23,2	19,5	24,9	20,0	25,5
1,5	12,1	15,4	12,2	15,6	13,3	17,0	13,7	17,5
2,5	7,41	9,45	7,56	9,64	7,98	10,2	8,21	10,47
4	4,61	5,88	4,70	5,99	4,95	6,3	5,09	6,49
6	3,08	3,93	3,11	3,97	3,30	4,2	3,39	4,32
10	1,83	2,33	1,84	2,35	1,91	2,4	1,95	2,49
16	1,15	1,47	1,16	1,48	1,21	1,5	1,24	1,58
25	0,727	0,927	0,734	0,936	0,78	0,995	0,795	1,014
35	0,524	0,668	0,529	0,675	0,554	0,706	0,565	0,720
50	0,387	0,493	0,391	0,499	0,386	0,492	0,393	0,501
70	0,268	0,342	0,270	0,344	0,272	0,347	0,277	0,353
95	0,193	0,249	0,195	0,249	0,206	0,263	0,210	0,268
120	0,153	0,195	0,154	0,196	0,161	0,205	0,164	0,209
150	0,124	0,158	0,126	0,161	0,129	0,164	0,132	0,168
185	0,0991	0,1264	0,100	0,128	0,106	0,135	0,108	0,138
240	0,0754	0,0961	0,0762	0,0972	0,0801	0,1021	0,0817	0,1042
300	0,0601	0,0766	0,0607	0,0774	0,0641	0,0817	0,0654	0,0834

Instrumentation, control and communications cables

Electrical resistance of conductors				
	Class 2		Class 5	
Nominal cross-sectional area	resistance of plain copper conductors at 20°C	DC resistance of tinned copper conductors at 20°C	DC resistance of plain copper conductors at 20°C	DC resistance of tinned copper conductors at 20°C
mm²	Ω/km	Ω/km	Ω/km	Ω/km
0,5	40,4	41,6	41,4	42,5
0,75	26,0	26,3	27,6	28,3
1	19,2	19,3	20,7	21,2
1,5	12,8	12,9	14,1	14,5
2,5	7,86	8,02	8,47	8,71

Loop inductance 0,6 mH/ km
Maximum capacitance:
– individuals cr 90 f / km
– collective cr 0,5 – 1 mm²: 65 f / km
– collective cr 1,5 mm²: 70 f / km

Classification Bureau	Type cables
ABS	FLAME-X 950 NKOGs
	FLAME-X 950 NTKOGsekw
	NKOXS
	NTKOXSekw (Multiparis)
	NTKOXSekf/ekw
	MVEPR-HXCuHX
	MVEPR-HXCuHX
	KONS
	FLAME-X 950 NTKOGsekw IB
	NTKOXSekw (Multicores)
	NTKOXSekw (Multiparis) IB
	NTKOXSekw (Multiparis)
	NTKOXSekf/ekw
	NTKOXSekw (Multicores)
	NTKOXSekw (Multiparis) IB
	FLAME-X 950 NTKOGsekw
	FLAME-X 950 NTKOGsekw IB
	FLAME-X 950 NKOGsekw
	NKOXSekw
GL	FLAME-X 950 NKOGs
	FLAME-X 950 NKOGsekw
	NKOXS
	NKOXSekw
	NTKOXSekw
	NTKOXSekw (IB)
	NTKOXSekf/ekw
	NTKOXSekf/ekw (IB)
	N-HKOXSek
	FLAME-X 950 NTKOGsekw
PRS	FLAME-X 950 NKOGs
	FLAME-X 950 NKOGsekw
	LGs
	LGs
	NKOXS
	NKOXSekw
PRS	FLAME-X 950 NKOGs
	FLAME-X 950 NKOGsekw
	FLAME-X 950 NTKOGsekw
	NTKOXSekw
	NKOXS
	NKOXSekw
RMRS	NTKOXSekf/ekw
	MVEPR-HXCuHX (90°C)

Classification Bureau	Type cables
BIUROVERITAS	NTKOXSekw
	FLAME-X 950 NTKOGSekw
	NKOXS
	NKOXSekw
	FLAME-X 950 NKOGs
	FLAME-X 950 NKOGsekw
CLASSNK	NKOXSekw
	NTKOXSekw
	FLAME-X 950 NTKOGsekw
	FLAME-X 950 NKOGsekw
	NTKOXSekf/ekw
	FLAME-X 950 NKOGs
	NKOXS
DNV	FLAME-X 950 NKOGs
	FLAME-X 950 NTKOGsekw
	NKOXSekw
	NKOXS
	FLAME-X 950 NKOGsekw
	NTKOXSekf/ekw
	KONS
	NTKOXSekw
	NTKOXSekf/ekwf
	NTKOXSekwf
LR	NTKOXSekw
	FLAME-X 950 NTKOGsekw
	NKOXS
	NKOXSekw
	657(*)(i) SW2
	657(*)(i) SW4
	658(*)(i) SW2
	658(*)(i) SW4
	657(*)(c) SW2
	657(*)(c) SW4
	658(*)(c) SW2
	658(*)(c) SW4
	657(*), 658(*) SW2
	657(*), 658(*) SW4
	FLAME-X 950 NKOGs
	FLAME-X 950 NKOGsekw
	NTKOXSekf/ekw
	FLAME-X 950 NTKOGsekw
	NTKOXSekw (Multicores)

notes

TELE-FONIKA Kable Sp. z o.o. SKA
Wielicka Street No. 114, 30-663 Cracow
T: (+48) 12 652 51 02, (+48) 12 652 59 31, (+48) 12 652 59 37
F: (+48) 12 652 59 28
export@tfkable.pl
www.tfkable.com