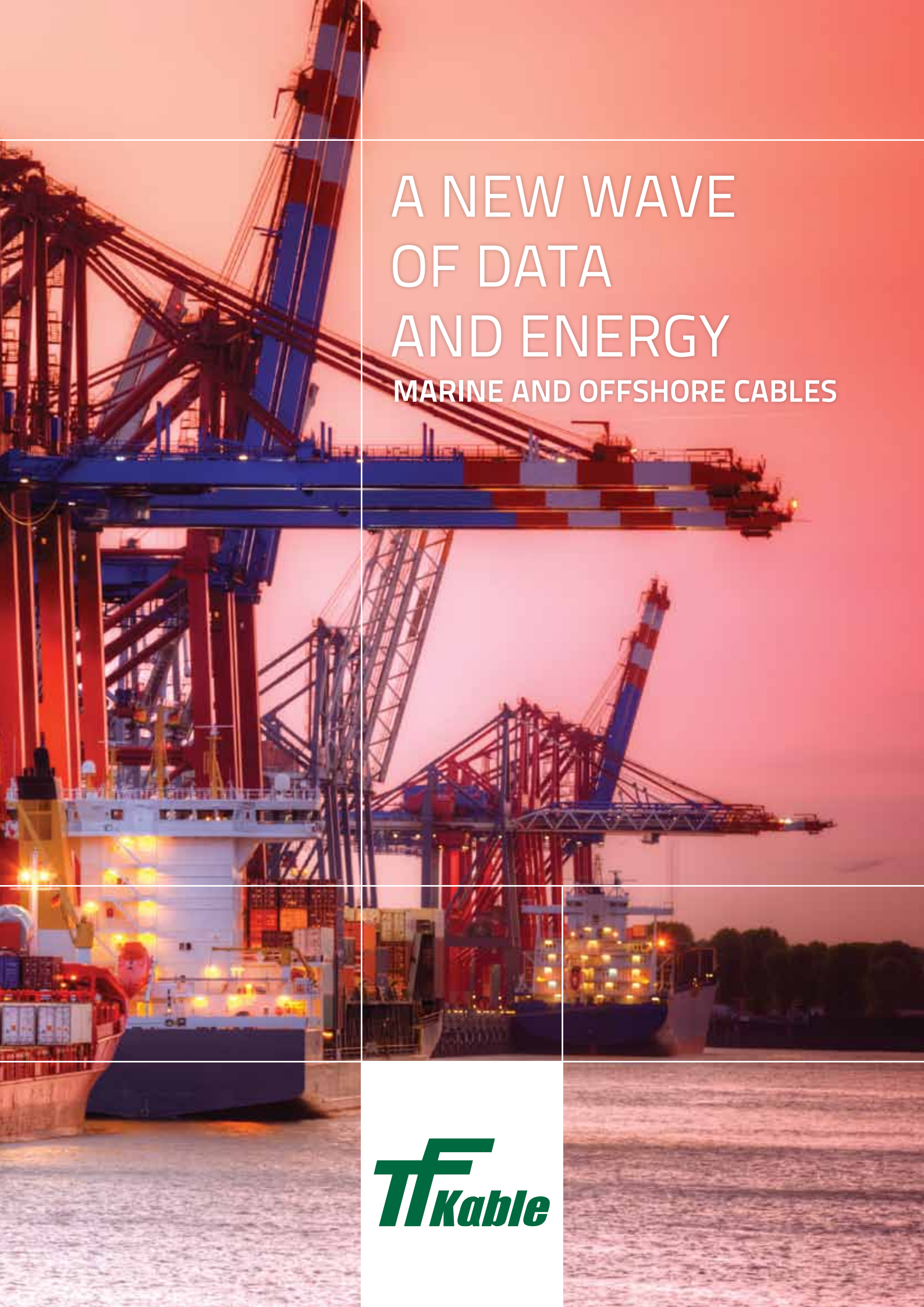
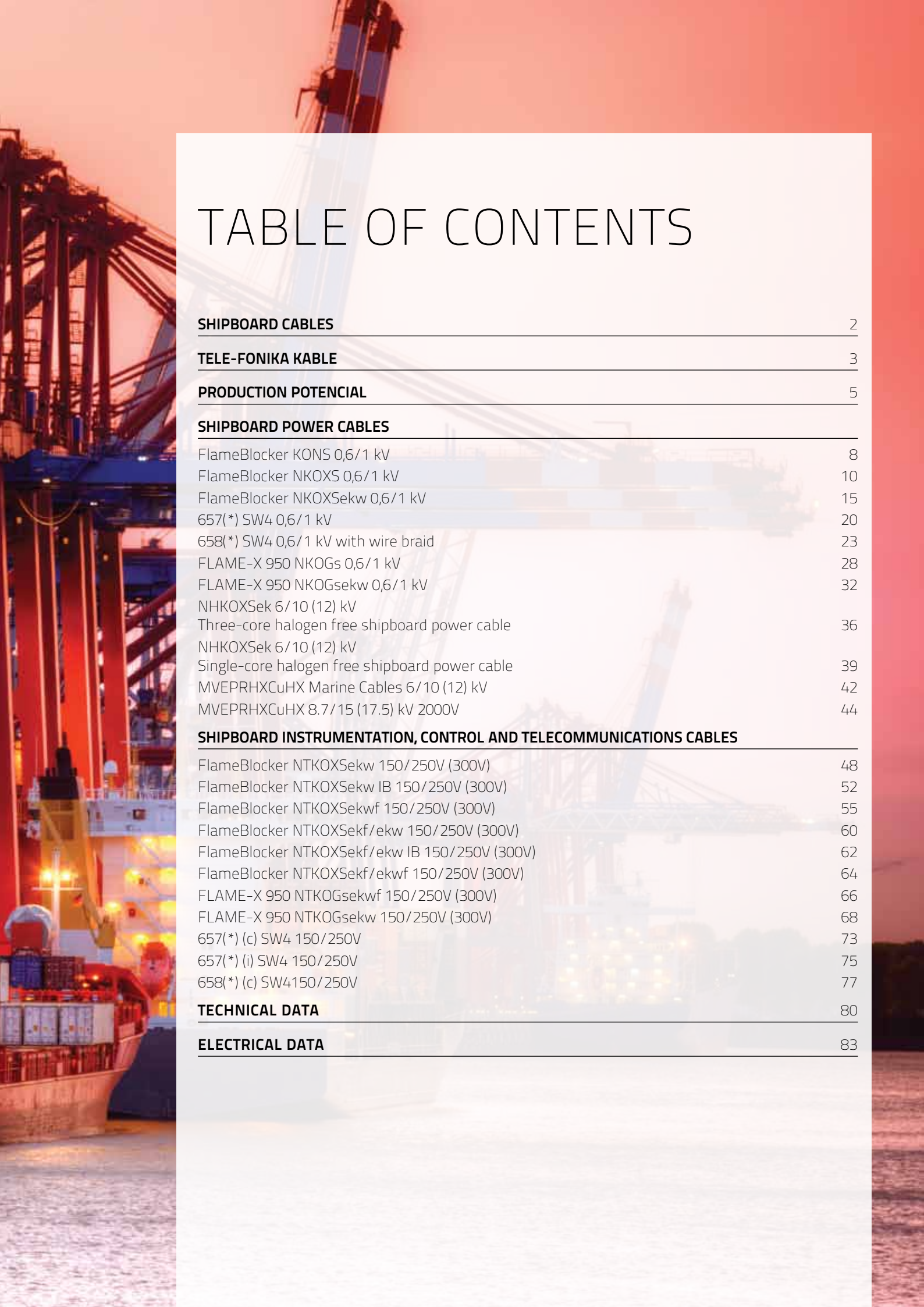


A NEW WAVE OF DATA AND ENERGY

MARINE AND OFFSHORE CABLES

TFKable



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MARINE CABLES

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

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

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

To ensure that our products meet the highest quality standards, our cables are subjected to third party certification testing 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.

TELE-FONIKA Kable

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 multi-skilled work teams, which have included eminent scientists working with our specialists, has been rewarded by the introduction of new-generation products and comprehensive services in the field 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 confirmed by over 460 certificates for groups of wares licensed by 34 renown centres of certifications worldwide. The company combines the good traditions of the cable industry in Poland and innovative technical solutions. TELE-FONIKA Kable Group consists of seven plants — five 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

Experience and innovation

PRODUCTION POTENCIAL

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

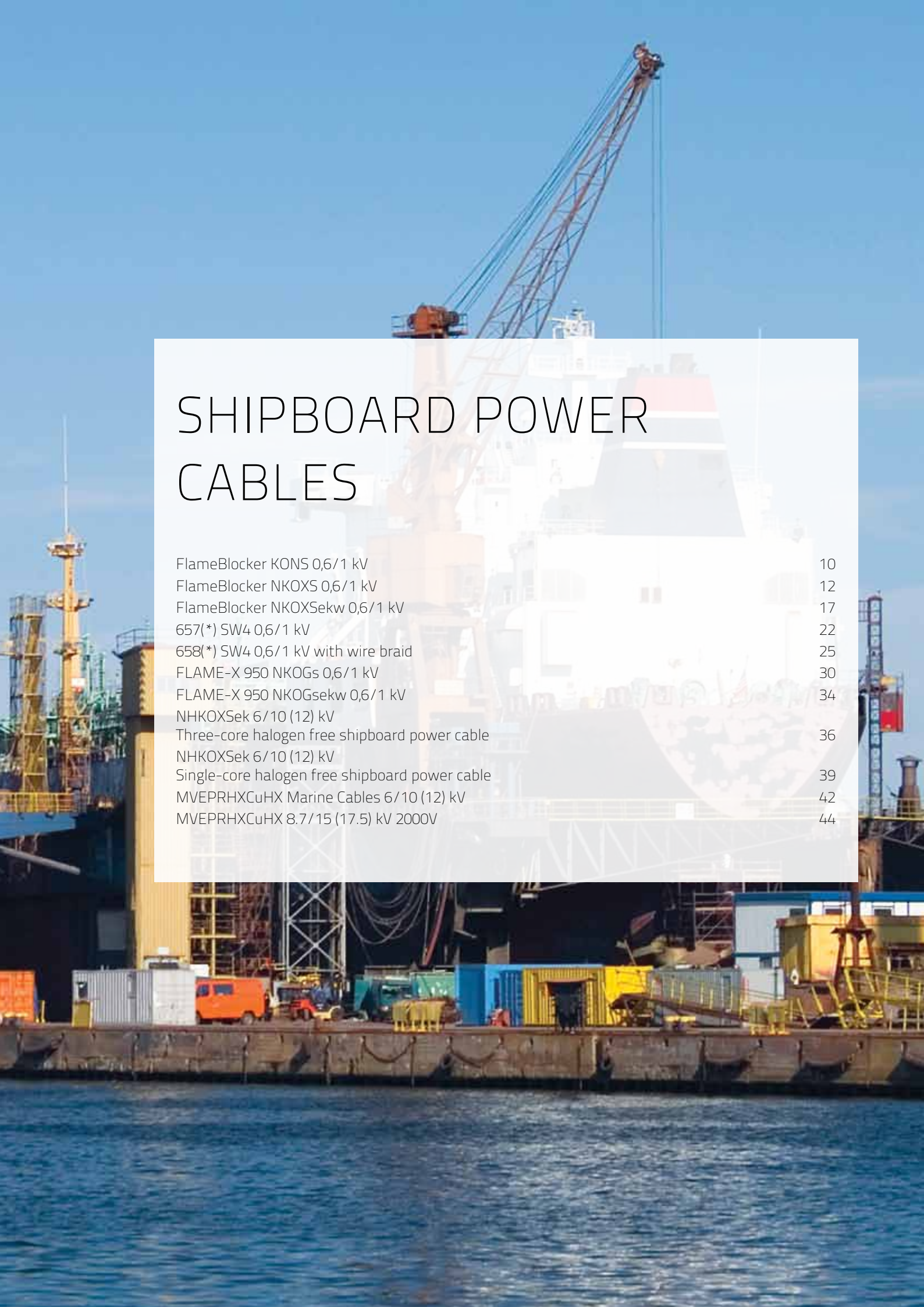
The plant was established in 1974. In 2007 the plant was joined into the TELE-FONIKA Kable Group. It specializes in the production of overhead conductors and cables for voltage up to 1 kV, including halogen-free, fire resistant and flame retardant cables versions.

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.

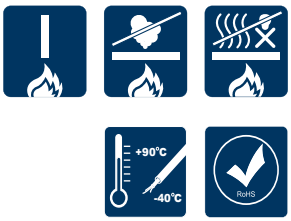
TF Kable

The way for energy



SHIPBOARD POWER CABLES

FlameBlocker KONS 0,6/1 kV



Halogen-free switchboard wire

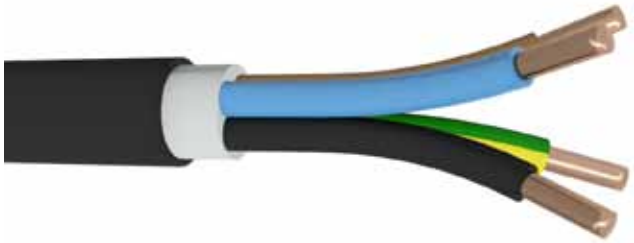
Standards: IEC 60092-353

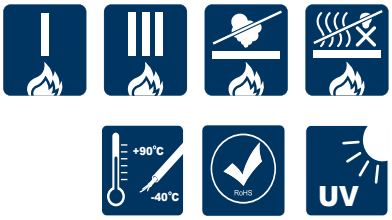
CONSTRUCTION	
Conductors	Stranded flexible bare or tinned copper class 5 acc. to EN 60228
Insulation	Halogen- free polyolefin compound type HF 90 acc. to IEC 60092-351
Colour of Insulation	Black, red, blue, white, green/yellow
	Outer suitable colour may be used.

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 µSmm^{-1}	
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 mm^2	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 mm^2 – circular compacted stranded bare or tinned copper class 2 10 to 300 mm^2 – circular stranded bare or tinned copper class 5 – sector shaped 35 to 300 mm^2 acc. to IEC 60228	
Insulation	Cross-linked polyethylene HF XLPE 90°C, > 35 mm^2 cross-linked polyolefin compound HF 90 acc. to IEC 60092-351	
Inner covering	Special flame-retardant, halogen-free compound for cables up to 16 mm^2, – tape bedding and special flame-retardant, halogen-free compound for cables 25 mm^2 and above – circular compacted stranded conductor, – tape bedding for cables 35mm^2 and above – sector shaped conductor	
Sheath	Thermoplastic halogen- free polyolefin compound type SHF1 acc. to IEC 60092-359	
Colour of Sheath	Black or grey	
Core identification	**NKOXS**	**NKOXS 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 and more:	white with black numbering	green-yellow, others cores 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)	Minimum bending radius
	≤ 25 mm	4 D
	> 25 mm	6 D
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 µSmm^{-1}	
Application	For fixed installations in all areas and open deck 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	

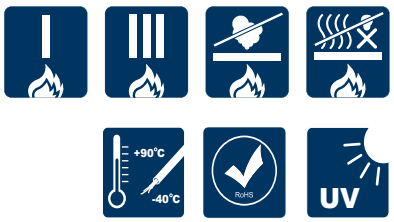
Number and cross-sectional area of conductor	Cables with conductor class 2		Cables with conductor class 5	
	Overall diameter	Net weight of cables	Overall diameter	Net weight of cables
n x mm^2	mm	kg/km	mm	kg/km
1 x 1	4,7	31	4,6	30
1 x 1,5	5,0	38	4,9	36
1 x 2,5	5,4	49	5,4	47
1 x 4	5,9	65	5,9	62
1 x 6	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
2 x 1	8,3	98	-	-	8,2	95
2 x 1,5	8,9	118	-	-	8,8	113
2 x 2,5	9,8	151	-	-	9,8	148
2 x 4	11,0	204	-	-	10,9	195
2 x 6	12,1	264	-	-	12,1	253
2 x 10	13,8	374	-	-	14,1	374
2 x 16	16	540	-	-	16,6	544
2 x 25	18,7	658	-	-	19,0	634
2 x 35	21,0	876	-	-	20,7	837
2 x 50	24,2	1205	-	-	25,3	1232
3 x 1	8,8	111	-	-	8,6	106
3 x 1,5	9,4	135	-	-	9,2	128
3 x 2,5	10,5	181	-	-	10,5	176
3 x 4	11,6	242	-	-	11,5	230
3 x 6	12,8	319	-	-	12,7	303
3 x 10	14,6	462	-	-	14,9	457
3 x 16	17,0	677	-	-	17,6	673
3 x 25	19,9	891	-	-	20,3	853
3 x 35	22,4	1195	19,6	1114	22,1	1139
3 x 50	26,0	1664	22,3	1550	27,2	1693
3 x 70	29,5	2323	26,0	2186	31,7	2346
3 x 95	33,9	3145	29,1	2953	36,4	3048
3 x 120	37,9	3948	32,5	3717	39,7	3844
3 x 150	42,5	4875	36,4	4593	44,8	4796
3 x 185	47,0	6084	40,6	5736	50,8	5901
3 x 240	53,2	7859	45,5	7452	54,8	7551
4 x 1	9,4	130	-	-	9,3	124
4 x 1,5	10,3	164	-	-	10,2	157
4 x 2,5	11,4	218	-	-	11,4	210
4 x 4	12,6	294	-	-	12,5	279
4 x 6	14,2	398	-	-	14,1	378
4 x 10	16,1	580	-	-	16,5	572
4 x 16	18,8	855	-	-	19,5	847
4 x 25	22,2	1158	-	-	22,6	1108
4 x 35	24,9	1560	22,4	1488	24,5	1484
4 x 50	28,9	2172	25,6	2076	30,3	2205
4 x 70	32,9	3036	29,7	2921	35,3	3063
4 x 95	38,0	4135	33,5	3970	40,8	4005
4 x 120	42,1	5168	37,5	4976	44,1	5018

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 mm^2	mm	kg/km	mm	kg/km	mm	kg/km
4 x 150	47,5	6410	41,8	6160	50,0	6293
4 x 185	52,5	7992	46,4	7687	56,7	7733
4 x 240	59,4	10322	52,1	9995	61,2	9910
5 x 1	10,4	157	-	-	10,2	150
5 x 1,5	11,2	194	-	-	11	184
5 x 2,5	12,4	259	-	-	12,3	249
5 x 4	14,0	359	-	-	13,8	340
5 x 6	15,5	479	-	-	15,4	454
5 x 10	17,6	703	-	-	18,0	691
5 x 16	20,5	1039	-	-	21,4	1030
5 x 25	24,6	1447	-	-	25,1	1384
5 x 35	27,7	1948	-	-	27,3	1858
5 x 50	32,1	2714	27,7	2608	33,6	2758
5 x 70	36,7	3811	32,2	3680	39,4	3851
6 x 1,5	12,1	226	-	-	11,9	214
6 x 2,5	13,6	310	-	-	13,5	298
7 x 1	11,2	186	-	-	11,0	178
7 x 1,5	12,1	233	-	-	11,9	221
7 x 2,5	13,6	323	-	-	13,5	309
8 x 1,5	13,0	264	-	-	12,8	250
9 x 1,5	13,9	304	-	-	13,7	288
10 x 1	14,1	267	-	-	13,8	254
10 x 1,5	15,2	333	-	-	15,0	317
10 x 2,5	17,2	464	-	-	17,1	444
12 x 1	14,5	293	-	-	14,2	279
12 x 1,5	15,7	370	-	-	15,4	350
12 x 2,5	17,7	519	-	-	17,6	496
14 x 1,5	16,7	423	-	-	16,4	400
16 x 1	16,1	370	-	-	15,8	351
16 x 1,5	17,5	471	-	-	17,2	444
16 x 2,5	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 mm^2	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 mm^2 – circular compacted stranded bare or tinned copper class 2 10 to 300 mm^2 – circular stranded bare or tinned copper class 5 – sector shaped 35 to 300 mm^2 acc. to IEC 60228	
Insulation	Cross-linked polyethylene HF XLPE 90°C, > 35 mm^2 cross-linked polyolefin compound HF 90 acc. to IEC 60092-351	
Inner covering	Special flame-retardant, halogen-free compound for cables up to 16 mm^2, – tape bedding and special flame-retardant, halogen-free compound for cables 25 mm^2 and above – circular compacted stranded conductor, – tape bedding for cables 35mm^2 and above – sector shaped conductor	
Screen (armour)	Copper wire braiding	
Sheath	Thermoplastic halogen- free polyolefin compound type SHF1 acc. to IEC 60092-359	
Colour of Sheath	Black or grey	
Core identification	**NKOXSekw**	**NKOXSekw 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 and more:	white with black numbering	green-yellow, others cores 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	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 µSmm^{-1}
Application	For fixed installations in all areas and open deck 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 mm^2	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 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 mm^2	mm	kg/km	mm	kg/km	mm	kg/km
2 x 1	9,1	131	-	-	9,0	127
2 x 1,5	9,7	154	-	-	9,6	145
2 x 2,5	10,8	191	-	-	10,8	187
2 x 4	11,8	241	-	-	11,7	233
2 x 6	13,5	345	-	-	13,5	335
2 x 10	15,0	462	-	-	15,3	461
2 x 16	17,2	638	-	-	17,8	640
2 x 25	20,9	844	-	-	21,2	821
2 x 35	23,2	1085	-	-	22,9	1045
2 x 50	26,6	1447	-	-	27,7	1477
3 x 1	9,6	144	-	-	9,4	139
3 x 1,5	10,4	176	-	-	10,2	170
3 x 2,5	11,3	222	-	-	11,3	216
3 x 4	12,4	287	-	-	12,3	276
3 x 6	14,2	402	-	-	14,1	387
3 x 10	16,0	560	-	-	16,3	553
3 x 16	18,2	778	-	-	18,8	772
3 x 25	22,3	1105	-	-	22,7	1069
3 x 35	24,8	1442	21,0	1264	24,5	1360
3 x 50	28,4	1933	23,7	1708	29,6	1965
3 x 70	32,3	2655	27,6	2382	34,5	2684
3 x 95	37,1	3580	30,7	3175	39,6	3534
3 x 120	41,1	4441	34,5	4056	42,9	4386
3 x 150	45,9	5447	38,4	4977	48,2	5419
3 x 185	50,4	6716	42,6	6165	54,2	6566
3 x 240	56,6	8553	47,5	7926	58,2	8265
4 x 1	10,4	171	-	-	10,3	166
4 x 1,5	11,1	204	-	-	11,0	197
4 x 2,5	12,2	261	-	-	12,2	253
4 x 4	14,0	377	-	-	13,9	362
4 x 6	15,4	488	-	-	15,3	468
4 x 10	17,3	683	-	-	17,7	673
4 x 16	20,0	966	-	-	20,7	956
4 x 25	24,6	1399	-	-	25	1358
4 x 35	27,3	1816	23,8	1641	26,9	1740
4 x 50	31,3	2452	27,0	2238	32,7	2514
4 x 70	36,1	3474	31,3	3115	38,5	3553
4 x 95	41,2	4635	35,5	4270	44,0	4558
4 x 120	45,5	5746	39,5	5312	47,5	5649

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 mm^2	mm	kg/km	mm	kg/km	mm	kg/km
4 x 150	50,9	7054	43,8	6529	53,4	6961
4 x 185	55,9	8691	48,4	8084	60,1	8487
4 x 240	62,8	11110	54,1	10383	64,6	10721
5 x 1	11,2	200	-	-	11,0	192
5 x 1,5	12,0	240	-	-	11,8	225
5 x 2,5	13,8	346	-	-	13,7	336
5 x 4	15,2	454	-	-	15,0	436
5 x 6	16,9	580	-	-	16,8	555
5 x 10	19,0	818	-	-	19,4	806
5 x 16	21,9	1167	-	-	22,8	1172
5 x 25	26,8	1690	-	-	27,3	1628
5 x 35	30,1	2237	-	-	29,7	2146
5 x 50	34,7	3042	29,1	2749	36,2	3115
5 x 70	39,7	4288	34,0	3916	42,4	4379
6 x 1,5	13,5	314	-	-	13,3	303
6 x 2,5	14,8	407	-	-	14,7	395
7 x 1	12,0	233	-	-	11,8	220
7 x 1,5	13,5	322	-	-	13,3	310
7 x 2,5	14,8	421	-	-	14,7	407
8 x 1,5	14,2	346	-	-	14,0	333
9 x 1,5	15,3	407	-	-	15,1	391
10 x 1	15,3	364	-	-	15,0	351
10 x 1,5	16,6	437	-	-	16,4	420
10 x 2,5	18,6	582	-	-	18,5	563
12 x 1	15,9	398	-	-	15,6	384
12 x 1,5	17,1	491	-	-	16,8	454
12 x 1,5	19,1	638	-	-	19,0	615
14 x 1,5	17,9	534	-	-	17,6	511
16 x 1	17,3	484	-	-	17,0	449
16 x 1,5	18,9	592	-	-	18,6	565
16 x 2,5	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
n x mm^2	mm	kg/km	mm	kg/km	mm	kg/km
19 x 1	18,2	527	-	-	17,8	506
19 x 1,5	19,8	667	-	-	19,5	620
19 x 2,5	22,2	904	-	-	22,1	868
20 x 1	19,2	562	-	-	18,7	539
20 x 1,5	20,7	701	-	-	20,4	669
20 x 2,5	23,2	951	-	-	23,1	913
24 x 1	21,0	651	-	-	20,5	624
24 x 1,5	23,0	824	-	-	22,6	786
24 x 2,5	25,7	1127	-	-	25,7	1082
27 x 1	21,6	702	-	-	21,1	672
27 x 1,5	23,4	880	-	-	23,0	837
27 x 2,5	26,3	1212	-	-	26,2	1162
30 x 1	22,3	765	-	-	21,8	716
30 x 1,5	24,4	954	-	-	24,0	907
30 x 2,5	27,3	1316	-	-	27,3	1261
37 x 1	23,9	873	-	-	23,3	833
37 x 1,5	26,1	1125	-	-	25,7	1068
37 x 2,5	29,3	1558	-	-	29,3	1490

657(*) SW4 0,6/1 kV

Halogen-free shipboard power cables with elastomer insulation and sheath

Standard: BS 6883

CONSTRUCTION		
Conductors	Tinned annealed circular stranded copper acc. to BS BS EN 60228 class 5 or class 2 for conductor size of 1 and 1,5 mm^2 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)	Minimum bending radius
	≤10 mm 10 < D ≤ 25 mm > 25 mm	3 D 4 D 6 D
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 conductor	Minimum number or 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 mm^2	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 or 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 mm^2	n / mm	mm	mm	mm	kg/km
3 x 50	19	1,4	1,8	28,9	1893
3 x 70	19	1,4	2,0	33,0	2611
3 x 95	37	1,6	2,2	38,5	3638
3 x 120	37	1,6	2,3	41,9	4400
3 x 150	37	1,8	2,5	46,5	5425
3 x 185	37	2,0	2,7	51,8	6754
3 x 240	61	2,2	2,9	58,6	8770
4 x 1	0,21	0,8	1,1	9,1	122
4 x 1,5	0,26	0,8	1,1	9,8	149
4 x 2,5	7	0,8	1,1	11,0	210
4 x 4	7	1,0	1,2	13,4	321
4 x 6	7	1,0	1,3	15,0	428
4 x 10	7	1,0	1,4	17,6	627
4 x 16	19	1,0	1,5	20,7	940
4 x 25	19	1,2	1,7	25,3	1442
4 x 35	19	1,2	1,8	28,3	1899
4 x 50	19	1,4	1,9	32,1	2439
4 x 70	19	1,4	2,1	36,7	3370
4 x 95	37	1,6	2,3	42,8	4700
4 x 120	37	1,6	2,5	46,8	5710
4 x 150	37	1,8	2,7	51,9	7035
5 x 1,5	0,26	0,8	1,1	10,7	180
5 x 2,5	7	0,8	1,2	12,2	260
7 x 1,5	0,26	0,8	1,2	12,8	252
7 x 2,5	7	0,8	1,2	14,4	359
12 x 1,5	0,26	0,8	1,3	15,6	370
12 x 2,5	7	0,8	1,4	17,9	543
19 x 1,5	0,26	0,8	1,4	19,4	570
19 x 2,5	7	0,8	1,5	22,2	842
27 x 1,5	0,26	0,8	1,6	22,4	766
37 x 1,5	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: BS 6883

CONSTRUCTION		
Conductors	Tinned annealed circular stranded copper acc. to BS 6360 class 5 or class 2 for conductor size of 1 and 1,5 mm^2 and class 2 for all other conductor sizes	
Insulation	Halogen-free elastomer compound type GP4 acc. to BS 7655-1.2	
Inner Sheath	Halogen-free, heat-resistant, oil-resisting and flame-retardant elastomer compound type SW4 acc. to BS 7655-2.6	
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%)	
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)	Minimum bending radius
	≤ 25 mm	4 D
	> 25 mm	6 D
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 deck in ships and offshore units	
Standard length cable packing	1000 m on drums. Other forms of packing are available on request	
Approvals	LR	

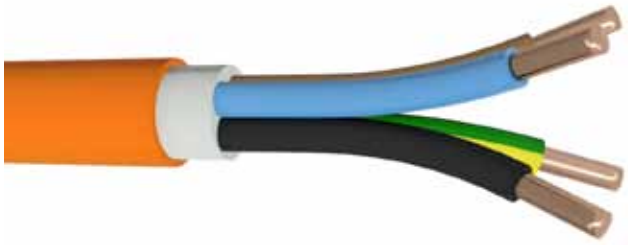
Number and cross-sectional area of conductor	Minimum number or maximum diameter of wires in conductor	Nominal thickness of insulation	Nominal thickness of inner sheath	Nominal diameter of steel wire braid	Nominal thickness of outer sheath	Approximate overall diameter	Approximate net weight of cables
n x mm^2	n / mm	mm	mm	mm	mm	mm	kg/km
2 x 1	0,21	0,8	1,0	0,30	1,2	11,6	200
2 x 1,5	0,26	0,8	1,1	0,30	1,2	12,4	241
2 x 2,5	7	0,8	1,1	0,30	1,2	13,4	283
2 x 4	7	1,0	1,2	0,30	1,3	15,6	387
2 x 6	7	1,0	1,2	0,30	1,4	16,9	476
2 x 10	7	1,0	1,3	0,30	1,4	19,2	627
2 x 16	19	1,0	1,4	0,30	1,5	22,0	853
2 x 25	19	1,2	1,5	0,30	1,7	26,1	1212
2 x 35	19	1,2	1,6	0,30	1,8	28,8	1532
2 x 50	19	1,4	1,7	0,45	2,0	33,0	2038
2 x 70	19	1,4	1,9	0,45	2,1	37,1	2680
2 x 95	37	1,6	2,1	0,45	2,3	42,6	3593
2 x 120	37	1,6	2,2	0,45	2,5	46,2	4291
2 x 150	37	1,8	2,3	0,45	2,6	50,5	5120
3 x 1	0,21	0,8	1,1	0,30	1,2	12,2	237
3 x 1,5	0,26	0,8	1,1	0,30	1,2	12,9	263
3 x 2,5	7	0,8	1,1	0,30	1,3	14,1	323
3 x 4	7	1,0	1,2	0,30	1,3	16,3	439
3 x 6	7	1,0	1,2	0,30	1,4	17,7	547
3 x 10	7	1,0	1,3	0,30	1,5	20,4	743
3 x 16	19	1,0	1,4	0,30	1,6	23,3	1029
3 x 25	19	1,2	1,6	0,30	1,8	27,8	1515
3 x 35	19	1,2	1,7	0,45	1,9	31,4	2032
3 x 50	19	1,4	1,8	0,45	2,0	35,0	2547
3 x 70	19	1,4	2,0	0,45	2,2	39,6	3340
3 x 95	37	1,6	2,2	0,45	2,4	45,5	4514
3 x 120	37	1,6	2,3	0,45	2,6	49,3	5408
3 x 150	37	1,8	2,5	0,45	2,8	54,3	6587
3 x 185	37	2,0	2,7	0,45	3,0	59,9	8072
3 x 240	61	2,2	2,9	0,45	3,2	67,1	10311

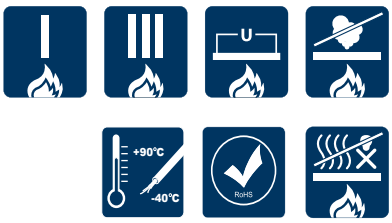
Number and cross-sectional area of conductor	Minimum number or maximum diameter of wires in conductor	Nominal thickness of insulation	Nominal thickness of inner sheath	Nominal diameter of steel wire braid	Nominal thickness of outer sheath	Approximate overall diameter	Approximate net weight of cables
n x mm^2	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 or 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 mm^2	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	558
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 or 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 mm^2	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	932
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: IEC 60092-353

CONSTRUCTION		
Conductors	Circular or circular compacted stranded bare or tinned copper class 2 acc. to IEC 60228	
Insulation	Special cross-linked compound HF S 95 acc. to IEC 60092-351	
Inner covering	– special flame-retardant, halogen-free compound for cables up to 16 mm^2, – tape bedding and special flame-retardant, halogen-free compound for cables 25 mm^2 and above	
Outer Sheath	Thermoplastic halogen – free polyolefin compound type SHF1 acc. to IEC 60092-359	
Colour of Sheath	Orange	
Core identification	**NKOGs**	**NKOGs 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

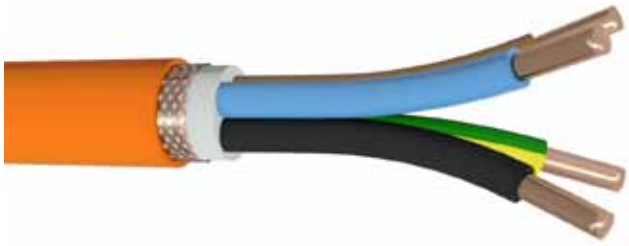
TECHNICAL DATA		
Maximum conductor operating temperature: +90°C		
Lowest ambient temperature for fixed installation: -40°C		
Lowest installation temperature: -15°C		
Maximum short-circuit conductor temperature: +250°C		
Minimum bending radius	Overall diameter of cable (D)	Minimum bending radius
	≤ 25 mm	4 D
	> 25 mm	6 D
Fire resistant	IEC 60331-21: for cable diameters ≤ 20 mm; IEC 60331-31: for cable diameters > 20 mm	
Flame retardant	IEC 60332-3-22 Category A/F	
Smoke emission	IEC 61034-2	
Gases evolved during combustion	IEC 60754-1: < 0,5% acid gas IEC 60754-2: pH ≥ 4,3; conductivity ≤ 10 μSmm^{-1}	
Application	For fixed installations in all areas and open deck 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	

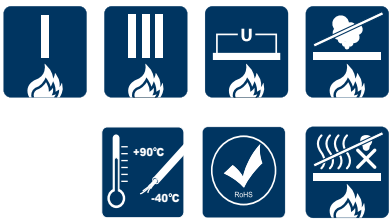
Number and cross-sectional area of conductor	Approximate overall diameter	Approximate net weight of cables	Maximum conductor resistance at temperature 20°C
n x mm²	mm	kg/km	Ω/km
1 x 1	5,3	39	18,1
1 x 1,5	5,6	46	12,1
1 x 2,5	6,0	59	7,41
1 x 4	6,7	80	4,61
1 x 6	7,3	103	3,08
1 x 10	8,0	143	1,83
1 x 16	9,0	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	1334	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
n x mm²	mm	kg/km	Ω/km
3 x 35	24,9	1355	0,524
3 x 50	28,7	1811	0,387
3 x 70	32,2	2492	0,268
3 x 95	37,5	3400	0,193
3 x 120	40,8	4169	0,153
3 x 150	45,8	5170	0,124
3 x 185	50,3	6397	0,0991
3 x 240	57,0	8254	0,0754
4 x 1	11,1	174	18,1
4 x 1,5	11,8	207	12,1
4 x 2,5	12,8	264	7,41
4 x 4	14,3	353	4,61
4 x 6	15,6	456	3,08
4 x 10	17,6	646	1,83
4 x 16	20,2	929	1,15
4 x 25	24,8	1319	0,727
4 x 35	27,6	1735	0,524
4 x 50	32,1	2343	0,387
4 x 70	35,7	3212	0,268
4 x 95	41,8	4400	0,193
4 x 120	45,7	5436	0,153
4 x 150	51,0	6697	0,124
4 x 185	56,0	8295	0,0991
4 x 240	63,6	10735	0,0754
5 x 1	12,0	207	18,1
5 x 1,5	12,8	247	12,1
5 x 2,5	14,2	326	7,41
5 x 4	15,6	428	4,61
5 x 6	17,3	564	3,08
5 x 10	19,4	798	1,83
5 x 16	22,4	1153	1,15
5 x 25	27,3	1641	0,727
5 x 35	30,5	2179	0,524
5 x 50	35,7	2965	0,387
5 x 70	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
n x mm²	mm	kg/km	Ω/km
7 x 1	13,2	253	18,1
7 x 1,5	14,1	306	12,1
7 x 2,5	15,4	398	7,41
10 x 1	16,7	363	18,1
10 x 1,5	17,8	439	12,1
10 x 2,5	19,8	583	7,41
12 x 1	17,2	400	18,1
12 x 1,5	18,4	487	12,1
12 x 2,5	20,4	650	7,41
14 x 1,5	19,5	552	12,1
16 x 1	19,2	506	18,1
16 x 1,5	20,5	618	12,1
16 x 2,5	22,8	831	7,41
19 x 1	20,2	566	18,1
19 x 1,5	21,8	706	12,1
19 x 2,5	24,0	940	7,41
20 x 1	21,1	604	18,1
20 x 1,5	22,9	754	12,1
20 x 2,5	25,3	1014	7,41
24 x 1	23,6	717	18,1
24 x 1,5	25,6	896	12,1
24 x 2,5	28,3	1205	7,41
30 x 1	25,2	850	18,1
30 x 1,5	27,2	1063	12,1
30 x 2,5	30,2	1440	7,41
37 x 1	27,1	1001	18,1
37 x 1,5	29,3	1258	12,1
37 x 2,5	32,9	1746	7,41

FLAME-X 950 NKOGsekw 0,6/1 kV





Halogen- free fire resistant shipboard power cables

Standard: IEC 60092-353

CONSTRUCTION		
Conductors	Circular or circular compacted stranded bare or tinned copper class 2 acc. to IEC 60228	
Insulation	Special cross-linked compound HF S 95 acc. to IEC 60092-351	
Inner covering	– special flame-retardant, halogen-free compound for cables up to 16 mm^2, – tape bedding and special flame-retardant, halogen-free compound for cables 25 mm^2 and above	
Outer Sheath	Thermoplastic halogen – free polyolefin compound type SHF1 acc. to IEC 60092-359	
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	IEC 60331-21: for cable diameters ≤ 20 mm; IEC 60331-31: for cable diameters > 20 mm
Flame retardant	IEC 60332-3-22 Category A/F
Smoke emission	IEC 61034-2
Gases evolved during combustion	IEC 60754-1: < 0,5% acid gas IEC 60754-2: pH ≥ 4,3; conductivity ≤ 10 μSmm^{-1}
Application	For fixed installations in all areas and open deck 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	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
n x mm²	mm	kg/km	Ω/km
3 x 35	26,1	1578	0,524
3 x 50	29,9	2060	0,387
3 x 70	33,4	2766	0,268
3 x 95	39,3	3862	0,193
3 x 120	42,6	4684	0,153
3 x 150	47,4	5665	0,124
3 x 185	51,9	6941	0,0991
3 x 240	58,6	8870	0,0754
4 x 1	11,9	226	18,1
4 x 1,5	12,6	269	12,1
4 x 2,5	13,6	324	7,41
4 x 4	15,5	459	4,61
4 x 6	17,0	586	3,08
4 x 10	18,8	783	1,83
4 x 16	21,4	1079	1,15
4 x 25	26,0	1541	0,727
4 x 35	28,8	1957	0,524
4 x 50	33,3	2617	0,387
4 x 70	37,3	3607	0,268
4 x 95	43,4	4893	0,193
4 x 120	47,3	5930	0,153
4 x 150	52,6	7248	0,124
4 x 185	57,6	8900	0,0991
4 x 240	65,2	11422	0,0754
5 x 1	12,8	269	18,1
5 x 1,5	13,6	308	12,1
5 x 2,5	15,4	433	7,41
5 x 4	17,0	560	4,61
5 x 6	18,5	704	3,08
5 x 10	20,6	953	1,83
5 x 16	23,6	1320	1,15
5 x 25	28,7	1833	0,727
5 x 35	31,7	2375	0,524
5 x 50	37,3	3286	0,387
5 x 70	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
n x mm²	mm	kg/km	Ω/km
7 x 1	14,4	363	18,1
7 x 1,5	15,3	414	12,1
7 x 2,5	16,6	523	7,41
10 x 1	17,9	506	18,1
10 x 1,5	19,0	580	12,1
10 x 2,5	21,0	739	7,41
12 x 1	18,4	544	18,1
12 x 1,5	19,8	638	12,1
12 x 2,5	21,6	808	7,41
14 x 1,5	20,7	713	12,1
16 x 1	20,4	668	18,1
16 x 1,5	21,7	778	12,1
16 x 2,5	24,0	1007	7,41
19 x 1	21,4	727	18,1
19 x 1,5	23,0	884	12,1
19 x 2,5	25,4	1136	7,41
20 x 1	22,5	792	18,1
20 x 1,5	24,1	930	12,1
20 x 2,5	26,5	1223	7,41
24 x 1	24,8	903	18,1
24 x 1,5	26,8	1107	12,1
24 x 2,5	29,5	1440	7,41
27 x 1	25,5	972	18,1
27 x 1,5	27,3	1180	12,1
27 x 2,5	30,2	1546	7,41
30 x 1	26,4	1064	18,1
30 x 1,5	28,4	1275	12,1
30 x 2,5	31,4	1676	7,41
37 x 1	28,5	1228	18,1
37 x 1,5	30,5	1496	12,1
37 x 2,5	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 (overall screen):	Bare copper braid
Separator	Separating tape – optionally
Outer Sheath	Halogen free compound type SHF 1
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 µSmm^{-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 mm^2/mm^2	3x25/16	3x35/16	3x50/16
CONSTRUCTION DATA				
Phase copper round conductor – nominal cross sectional area – number of wires – diameter and tolerance	 mm^2 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	 mm^2 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	3 237	3 684	4 332
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	2 061	2 251	2 575
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 D.C. phase conductor resistance at 20 °C Maximum A.C. 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 IEC60092-352 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 mm^2/mm^2	3x70/16	3x95/16	3x120/16	3x150/25
CONSTRUCTION DATA					
Phase copper round conductor – nominal cross sectional area – number of wires – diameter and tolerance	 mm^2 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	3.402.96			
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	 mm^2 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 D.C. phase conductor resistance at 20°C Maximum A.C. 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 IEC60092-352 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

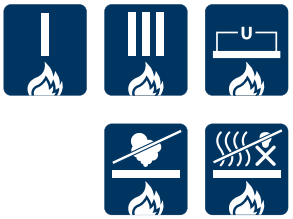
Standard: IEC 60092-354

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 SHF 1
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 µSmm^{-1}
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 mm^2/mm^2	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	 mm^2 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	 mm^2 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	1 987
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 D.C. phase conductor resistance at 20 °C Maximum A.C. 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 IEC60092-352 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 mm^2/mm^2	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	 mm^2 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	 mm^2 No. x mm x mm	 ≥ 16 2x30x0.30	 ≥ 25 2 x 40 x 0.35			
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	2 272	2 703	3 217	3 865	4 528
DELIVERY DATA						
Length per drum ± 5 %	m	1 000				
Diameter and max. width of wooden drum – type	m x m	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	2 583	3 145	3 626	4 481	5 144
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 D.C. phase conductor resistance at 20 °C Maximum A.C. 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 IEC60092-352 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

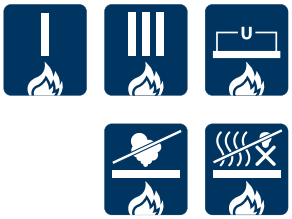
Standard: IEC 60228, IEC 60092-350, IEC 60092-354, IEC 60332 Cat. A , IEC 60754-1 I 2, IEC 61034

CONSTRUCTION	
Conductors	Annealed stranded bare copper Class 2 in accordance IEC 60228
Conductor shield:	Semi-conducting tape layer between the conductor and insulation
Insulation	Ethylene-propylene rubber type E 90 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	Outer diameter			Approx. Weight kg/km
	Minimum mm	Approx. mm	Maximum mm	
1 x 25	21.95	23.30	24.00	947
1 x 35	22.50	24.40	25.50	1085
1 x 50	23.50	25.80	26.50	1262
1 x 70	25.00	27.30	28.00	1516
1 x 95	27.00	29.40	30.00	1850
1 x 120	28.50	30.90	32.00	2142
1 x 150	30.50	33.10	33.50	2512
1 x 185	32.00	34.80	36.00	2919
1 x 240	35.00	37.90	38.50	3644
1 x 300	37.00	39.80	41.00	4291
3 x 25	42.00	45.50	46.50	3263
3 x 35	44.50	47.90	49.50	3744
3 x 50	47.00	51.00	51.50	4377
3 x 70	50.50	54.10	56.00	5262
3 x 95	54.50	59.10	60.00	6511
3 x 120	58.50	62.40	64.50	7529
3 x 150	61.50	66.20	67.50	8717

Size mm²	Stranding	Conductor Diameter mm	Thickness of semi-con. tape +layer over conductor mm	Thickness of insulation mm	Thickness of semi-con +Cu over insulation mm	Diameter over ins. and screens or core of cable mm	Inner covering thickness= mm	Thickness of conc. screen Cu wires mm	Outer sheath thickness mm
1 x 25	7x2.13	6.10	0.2+0.7	3.4	0.8+0.127	16.70	1.0	0.3	1.6
1 x 35	7x2.52	7.15	0.2+0.7	3.4	0.8+0.127	17.70	1.0	0.3	1.6
1 x 50	19x1.84	8.45	0.2+0.7	3.4	0.8+0.127	19.00	1.0	0.3	1.7
1 x 70	14x2.55	9.80	0.2+0.7	3.4	0.8+0.127	20.40	1.0	0.3	1.8
1 x 95	19x2.55	11.75	0.2+0.7	3.4	0.8+0.127	22.30	1.0	0.3	1.8
1 x 120	19x2.87	13.15	0.2+0.7	3.4	0.8+0.127	23.70	1.0	0.3	1.9
1 x 150	19x3.20	14.80	0.2+0.7	3.4	0.8+0.127	25.40	1.2	0.3	2.0
1 x 185	37x2.55	16.30	0.2+0.7	3.4	0.8+0.127	26.90	1.2	0.3	2.0
1 x 240	37x2.87	18.80	0.2+0.7	3.4	0.8+0.127	29.40	1.2	0.4	2.1
1 x 300	46x3.02	20.60	0.2+0.7	3.4	0.8+0.127	31.20	1.2	0.4	2.2
3 x 25	7x2.13	6.10	0.2+0.7	3.4	0.8+0.127	16.70	1.4	0.4	2.4
3 x 35	7x2.52	7.15	0.2+0.7	3.4	0.8+0.127	17.70	1.4	0.4	2.5
3 x 50	19x1.84	8.45	0.2+0.7	3.4	0.8+0.127	19.00	1.4	0.4	2.6
3 x 70	19x2.10	10.51	0.2+0.7	3.4	0.8+0.127	20.40	1.4	0.4	2.7
3 x 95	19x2.55	11.75	0.2+0.7	3.4	0.8+0.127	22.30	1.6	0.4	2.9
3 x 120	19x2.87	13.15	0.2+0.7	3.4	0.8+0.127	23.70	1.6	0.4	3.1
3 x 150	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: IEC 60228, IEC 60092-350, IEC 60092-354, IEC 60332 Cat. A , IEC 60754-1 I 2, IEC 61034

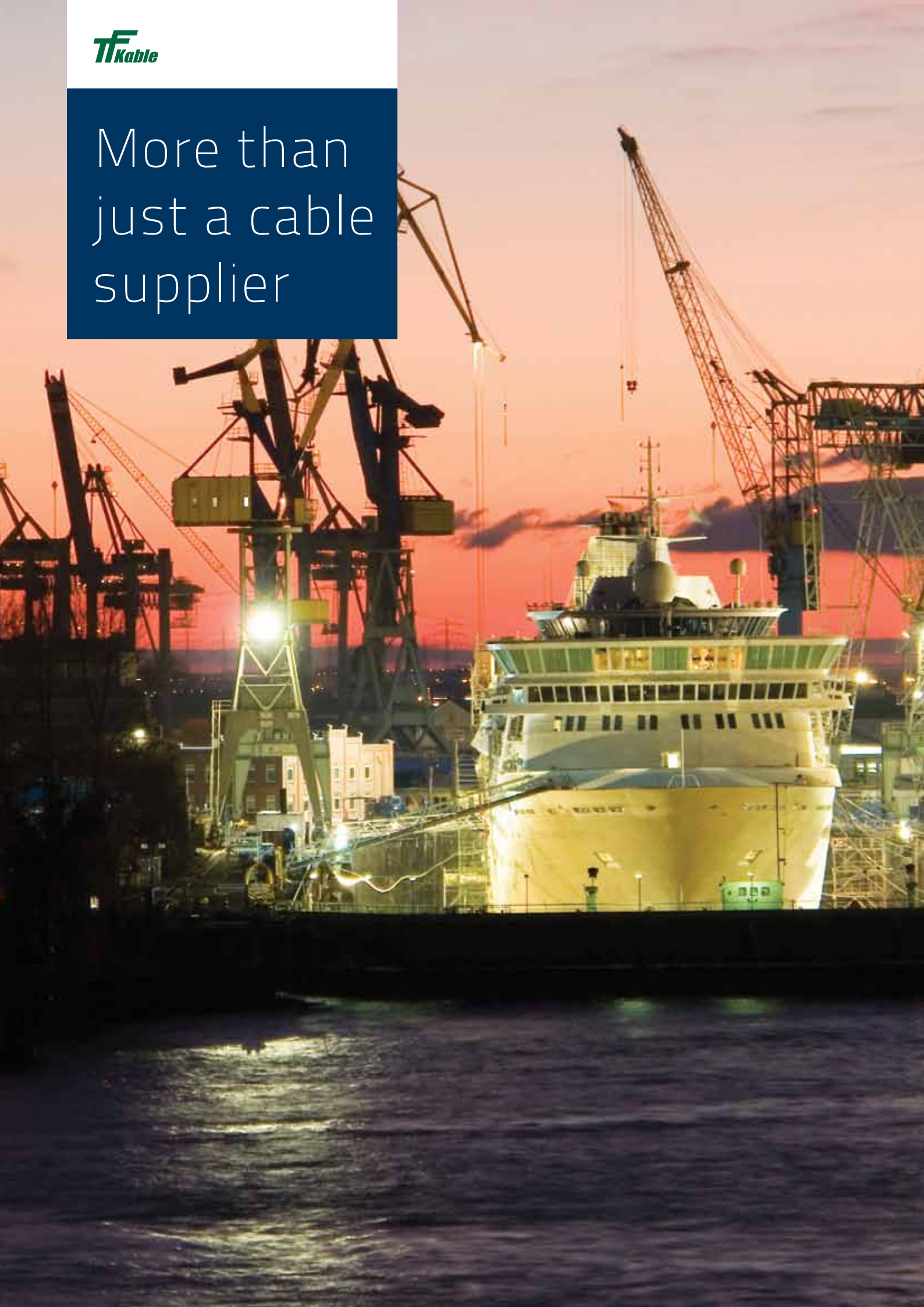
CONSTRUCTION	
Conductors	Annealed stranded bare copper Class 2 in accordance IEC 60228
Conductor shield:	Semi-conducting tape layer between the conductor and insulation
Insulation	Ethylene-propylene rubber type E 90 to 3.22 UL 1309
Insulation shield:	Semi-conducting layer + bare copper tape
Inner covering	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	Średnica zewnętrzna			Approx. Weight kg/km
	Minimum mm	Approx. mm	Maximum mm	
1 x 25	23.5	25.5	26.5	1035
1 x 35	25.0	26.8	28.0	1186
1 x 50	26.0	28.0	29.0	1384
1 x 70	27.5	30.2	30.5	1639
1 x 95	29.5	31.5	32.5	1969
1 x 120	31.5	33.5	35.0	2305
1 x 150	33.0	35.3	36.5	2666
1 x 185	35.0	36.8	39.0	3148
1 x 240	38.0	40.0	42.0	3835
1 x 300	40.0	43.8	44.0	4485
3 x 25	47.5	49.1	52.0	3905
3 x 35	49.5	50.3	54.5	4438
3 x 50	52.0	52.8	57.0	5108
3 x 70	56.0	56.2	61.5	6175
3 x 95	59.5	63.8	65.5	7325
3 x 120	63.5	67.3	69.5	8505
3 x 150	66.5	71.1	73.5	9744
3 x 185	69.5	74.4	78.0	11150
3 x 240	79.0	83.5	87.5	13936

Size mm²	Stranding	Conductor Diameter mm	Thickness of semi-con. tape +layer over conductor mm	Thickness of insulation mm	Thickness of semi-con +Cu over insulation mm	Diameter over ins. and screens or core of cable mm	Inner covering thickness= mm	Thickness of conc. screen Cu wires mm	Outer sheath thickness mm
1 x 25	7 x 2.13	6.10	0.2+0.7	4.5	0.8+0.127	18.80	1.0	0.3	1.7
1 x 35	7 x 2.52	7.15	0.2+0.7	4.5	0.8+0.127	19.85	1.0	0.3	1.8
1 x 50	19 x 1.84	8.45	0.2+0.7	4.5	0.8+0.127	21.15	1.0	0.3	1.8
1 x 70	19 x 2.10	10.51	0.2+0.7	4.5	0.8+0.127	23.20	1.0	0.3	1.8
1 x 95	19 x 2.55	11.75	0.2+0.7	4.5	0.8+0.127	24.45	1.0	0.3	1.9
1 x 120	19 x 2.87	13.15	0.2+0.7	4.5	0.8+0.127	25.85	1.2	0.3	2.0
1 x 150	19 x 3.20	14.80	0.2+0.7	4.5	0.8+0.127	27.50	1.2	0.3	2.1
1 x 185	37 x 2.55	16.30	0.2+0.7	4.5	0.8+0.127	29.00	1.2	0.3	2.1
1 x 240	37 x 2.87	18.80	0.2+0.7	4.5	0.8+0.127	31.50	1.2	0.4	2.2
1 x 300	61 x 2.48	22.26	0.2+0.7	4.5	0.8+0.127	35.00	1.2	0.4	2.4
3 x 25	7 x 2.13	6.10	0.2+0.7	4.5	0.8+0.127	40.60	1.4	0.4	2.6
3 x 35	7 x 2.52	7.15	0.2+0.7	4.5	0.8+0.127	42.90	1.4	0.4	2.7
3 x 50	19 x 1.84	8.45	0.2+0.7	4.5	0.8+0.127	45.70	1.6	0.4	2.8
3 x 70	19 x 2.10	10.51	0.2+0.7	4.5	0.8+0.127	50.20	1.6	0.4	3.0
3 x 95	19 x 2.55	11.75	0.2+0.7	4.5	0.8+0.127	52.80	1.6	0.4	3.1
3 x 120	19 x 2.87	13.15	0.2+0.7	4.5	0.8+0.127	55.90	1.6	0.4	3.3
3 x 150	19 x 3.20	14.80	0.2+0.7	4.5	0.8+0.127	59.40	1.6	0.4	3.4
3 x 185	37 x 2.55	16.00	0.2+0.7	4.5	0.8+0.127	62.00	1.8	0.4	3.5
3 x 240	61 x 2.21	19.90	0.2+0.7	4.5	0.8+0.127	70.40	1.8	0.4	3.8

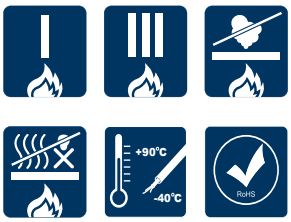
TFKable

More than just a cable supplier



SHIPBOARD INSTRUMENTATION, CONTROL AND TELECOMMUNICATIONS CABLES

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 µSmm^{-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 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
1 x 2 x 0,5RM	7	0,4	0,1	0,20	1,00	6,4	6,8	7,8	72
2 x 2 x 0,5RM*	7	0,4	0,1	0,20	1,00	7,0	7,6	8,6	94
3 x 2 x 0,5RM	7	0,4	0,1	0,20	1,10	9,0	9,7	11,0	126
4 x 2 x 0,5RM	7	0,4	0,1	0,20	1,10	9,6	10,4	11,5	148
7 x 2 x 0,5RM	7	0,4	0,1	0,20	1,20	11,0	12,3	13,5	211
10 x 2 x 0,5RM	7	0,4	0,1	0,30	1,30	14,5	15,7	17,5	330
12 x 2 x 0,5RM	7	0,4	0,1	0,30	1,30	15,0	16,2	18,0	358
14 x 2 x 0,5RM	7	0,4	0,1	0,30	1,30	15,5	16,9	18,5	388
16 x 2 x 0,5RM	7	0,4	0,1	0,30	1,40	16,5	17,9	19,5	444
19 x 2 x 0,5RM	7	0,4	0,1	0,30	1,40	17,5	18,8	20,5	488
24 x 2 x 0,5RM	7	0,4	0,1	0,30	1,50	20,0	21,8	24,0	599
37 x 2 x 0,5RM	7	0,4	0,1	0,30	1,60	23,0	24,8	27,0	839
1 x 3 x 0,5RM	7	0,4	0,1	0,20	1,00	6,6	7,1	8,0	79
3 x 3 x 0,5RM	7	0,4	0,1	0,20	1,10	9,8	10,6	12,0	155
7 x 3 x 0,5RM	7	0,4	0,1	0,20	1,20	12,5	13,5	15,0	265
12 x 3 x 0,5RM	7	0,4	0,1	0,30	1,40	16,5	18,1	20,0	471
1 x 2 x 0,75RM	7	0,5	0,1	0,20	1,00	7,2	7,6	8,8	89
2 x 2 x 0,75RM*	7	0,5	0,1	0,20	1,00	8,0	8,5	9,8	112
3 x 2 x 0,75RM	7	0,5	0,1	0,20	1,10	10,5	11,1	13,0	164
4 x 2 x 0,75RM	7	0,5	0,1	0,20	1,20	11,5	12,2	14,0	199
5 x 2 x 0,75RM	7	0,5	0,1	0,20	1,20	12,5	13,1	15,0	226
7 x 2 x 0,75RM	7	0,5	0,1	0,20	1,20	13,5	14,2	16,5	277
8 x 2 x 0,75RM	7	0,5	0,1	0,30	1,30	15,5	16,4	18,5	358
10 x 2 x 0,75RM	7	0,5	0,1	0,30	1,40	17,5	18,5	21,0	435
12 x 2 x 0,75RM	7	0,5	0,1	0,30	1,40	18,0	19,0	21,5	476
14 x 2 x 0,75RM	7	0,5	0,1	0,30	1,40	19,0	19,9	22,5	536
16 x 2 x 0,75RM	7	0,5	0,1	0,30	1,50	20,0	21,1	24,0	590
19 x 2 x 0,75RM	7	0,5	0,1	0,30	1,50	21,0	22,2	25,0	671
20 x 2 x 0,75RM	7	0,5	0,1	0,30	1,60	22,5	23,5	26,5	710
24 x 2 x 0,75RM	7	0,5	0,1	0,30	1,70	25,0	26,0	29,5	841
37 x 2 x 0,75RM	7	0,5	0,1	0,30	1,80	28,5	29,7	33,5	1151
1 x 3 x 0,75RM	7	0,5	0,1	0,20	1,00	7,6	8,0	9,2	100
3 x 3 x 0,75RM	7	0,5	0,1	0,20	1,20	11,5	12,4	14,0	212
6 x 3 x 0,75RM	7	0,5	0,1	0,30	1,30	15,5	16,3	18,5	377
7 x 3 x 0,75RM	7	0,5	0,1	0,30	1,30	15,5	16,3	18,5	404
12 x 3 x 0,75RM	7	0,5	0,1	0,30	1,50	20,5	21,3	24,5	629

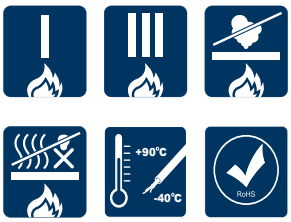
Number and cross-sectional area of conductor	Number of wires in conductor class 2	Nominal thickness of insulation	Thickness of tape	Diameter of wires in braiding	Nominal thickness of sheath	Overall diameter			Approximate net weight of cables
						Min.	Nom.	Max.	
n x mm^2	n	mm	mm	mm	mm	mm			kg/km
1 x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

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
1 x 3 x 1,5RM	7	0,60	0,1	0,20	1,10	8,8	9,6	11,0	144
2 x 3 x 1,5RM	7	0,60	0,1	0,20	1,10	13,0	14,0	15,5	266
3 x 3 x 1,5RM	7	0,60	0,1	0,30	1,30	14,5	15,7	17,5	367
4 x 3 x 1,5RM	7	0,60	0,1	0,30	1,30	15,5	17,1	19,0	446
7 x 3 x 1,5RM	7	0,60	0,1	0,30	1,50	19,0	20,5	22,5	662
8 x 3 x 1,5RM	7	0,60	0,1	0,30	1,50	21,0	22,9	25,0	751
12 x 3 x 1,5RM	7	0,60	0,1	0,30	1,70	25,0	27,0	29,5	1043
16 x 3 x 1,5RM	7	0,60	0,1	0,30	1,80	27,5	30,0	33,0	1320
2 x 2 x 2,5RM*	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 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
2 x 0,75RM	7	0,51	0,1	0,20	1,00	7,2	7,6	8,8	89
3 x 0,75RM	7	0,51	0,1	0,20	1,00	7,6	8,0	9,2	100
4 x 0,75RM	7	0,51	0,1	0,20	1,00	8,0	8,5	9,8	112
5 x 0,75RM	7	0,51	0,1	0,20	1,10	8,8	9,3	11,0	135
7 x 0,75RM	7	0,51	0,1	0,20	1,10	9,4	9,9	11,5	161
10 x 0,75RM	7	0,51	0,1	0,20	1,20	11,5	12,2	14,0	217
12 x 0,75RM	7	0,51	0,1	0,20	1,20	12,0	12,6	14,5	240
14 x 0,75RM	7	0,51	0,1	0,20	1,20	12,5	13,1	15,0	262
16 x 0,75RM	7	0,51	0,1	0,20	1,20	13,0	13,7	15,5	294
19 x 0,75RM	7	0,51	0,1	0,20	1,20	13,5	14,4	16,5	323
24 x 0,75RM	7	0,51	0,1	0,30	1,30	16,0	17,1	19,5	454
27 x 0,75RM	7	0,51	0,1	0,30	1,40	16,5	17,6	20,0	492
32 x 0,75RM	7	0,51	0,1	0,30	1,40	18,0	18,8	21,5	548
37 x 0,75RM	7	0,51	0,1	0,30	1,40	18,5	19,4	22,0	597
8 x 1,5RM	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 µSmm^{-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

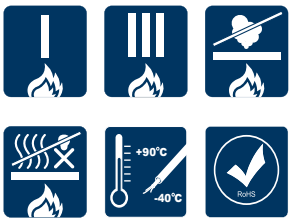
Multi-pairs cable with inner bedding (IB)

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
1 x 2 x 0,5RM	7	0,4	1,0	0,20	1,0	8,2	8,6	9,8	119
2 x 2 x 0,5RM*	7	0,4	1,0	0,20	1,1	9,2	9,5	11,0	142
3 x 2 x 0,5RM	7	0,4	1,0	0,20	1,1	11,0	11,4	13,0	184
4 x 2 x 0,5RM	7	0,4	1,0	0,20	1,2	11,5	12,4	14,0	219
7 x 2 x 0,5RM	7	0,4	1,0	0,20	1,2	13,0	14,0	16,0	284
10 x 2 x 0,5RM	7	0,4	1,0	0,30	1,4	16,5	17,7	19,5	435
12 x 2 x 0,5RM	7	0,4	1,0	0,30	1,4	17,0	18,1	20,0	466
14 x 2 x 0,5RM	7	0,4	1,0	0,30	1,4	17,5	18,8	21,0	501
19 x 2 x 0,5RM	7	0,4	1,0	0,30	1,5	19,5	20,7	23,0	611
24 x 2 x 0,5RM	7	0,4	1,0	0,30	1,6	22,5	23,7	26,0	737
37 x 2 x 0,5RM	7	0,4	1,0	0,30	1,7	25,0	26,7	29,5	958
1 x 3 x 0,5RM	7	0,4	1,0	0,20	1,1	8,6	9,1	10,5	130
3 x 3 x 0,5RM	7	0,4	1,0	0,20	1,2	12,0	12,5	14,0	230
7 x 3 x 0,5RM	7	0,4	1,0	0,30	1,3	15,0	15,9	18,0	394
12 x 3 x 0,5RM	7	0,4	1,0	0,30	1,4	18,5	19,8	22,0	578
1 x 2 x 0,75RM	7	0,5	1,0	0,20	1,1	9,4	9,6	11,0	142
2 x 2 x 0,75RM*	7	0,5	1,0	0,20	1,1	10,0	10,5	12,0	173
3 x 2 x 0,75RM	7	0,5	1,0	0,20	1,2	12,5	13,0	15,0	235
4 x 2 x 0,75RM	7	0,5	1,0	0,20	1,2	13,5	13,9	16,0	271
7 x 2 x 0,75RM	7	0,5	1,0	0,30	1,3	16,0	16,6	19,0	405
8 x 2 x 0,75RM	7	0,5	1,0	0,30	1,4	17,5	18,3	21,0	468
10 x 2 x 0,75RM	7	0,5	1,0	0,30	1,5	19,5	20,4	23,5	559
12 x 2 x 0,75RM	7	0,5	1,0	0,30	1,5	20,0	21,0	24,0	604
14 x 2 x 0,75RM	7	0,5	1,0	0,30	1,5	21,0	21,9	25,0	654
16 x 2 x 0,75RM	7	0,5	1,0	0,30	1,6	22,0	23,1	26,5	732
19 x 2 x 0,75RM	7	0,5	1,0	0,30	1,6	23,0	24,1	27,5	801
20 x 2 x 0,75RM	7	0,5	1,0	0,30	1,6	24,5	25,2	28,5	857
24 x 2 x 0,75RM	7	0,5	1,0	0,30	1,7	27,0	27,8	31,5	978
37 x 2 x 0,75RM	7	0,5	1,0	0,30	1,9	30,5	31,6	36,0	1296
1 x 3 x 0,75RM	7	0,5	1,0	0,20	1,1	9,6	9,9	11,5	157
3 x 3 x 0,75RM	7	0,5	1,0	0,30	1,3	14,0	14,8	17,0	323
7 x 3 x 0,75RM	7	0,5	1,0	0,30	1,4	17,5	18,3	21,0	514
12 x 3 x 0,75RM	7	0,5	1,0	0,30	1,6	22,5	23,3	26,5	769
1 x 2 x 1RM	7	0,5	1,0	0,20	1,1	9,4	9,9	11,5	160
2 x 2 x 1RM*	7	0,5	1,0	0,20	1,1	10,0	10,9	12,5	196
3 x 2 x 1RM	7	0,5	1,0	0,20	1,2	12,5	13,7	15,5	269
4 x 2 x 1RM	7	0,5	1,0	0,30	1,3	14,0	15,3	17,5	356

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 mm^2	n	mm	mm	mm	mm	mm			kg/km
7 x 2 x 1RM	7	0,5	1,0	0,30	1,4	16,5	17,7	20,0	483
10 x 2 x 1RM	7	0,5	1,0	0,30	1,5	20,0	21,6	24,0	632
12 x 2 x 1RM	7	0,5	1,0	0,30	1,5	20,5	22,2	24,5	706
14 x 2 x 1RM	7	0,5	1,0	0,30	1,5	21,5	23,2	25,5	768
19 x 2 x 1RM	7	0,5	1,0	0,30	1,6	23,5	25,6	28,5	953
24 x 2 x 1RM	7	0,5	1,0	0,30	1,8	27,5	29,7	33,0	1176
37 x 2 x 1RM	7	0,5	1,0	0,30	1,9	31,0	33,7	37,0	1550
1 x 3 x 1RM	7	0,5	1,0	0,20	1,1	9,8	10,3	12,0	173
3 x 3 x 1RM	7	0,5	1,0	0,30	1,3	14,5	15,5	17,5	377
7 x 3 x 1RM	7	0,5	1,0	0,30	1,4	18,0	19,3	21,5	586
12 x 3 x 1RM	7	0,5	1,0	0,30	1,6	23,0	24,7	27,5	914
1 x 2 x 1,5RM	7	0,6	1,0	0,20	1,1	10,0	10,9	12,5	192
2 x 2 x 1,5RM*	7	0,6	1,0	0,20	1,2	11,5	12,3	14,0	247
3 x 2 x 1,5RM	7	0,6	1,0	0,30	1,3	15,0	16,0	18,0	380
4 x 2 x 1,5RM	7	0,6	1,0	0,30	1,4	16,5	17,4	19,5	455
7 x 2 x 1,5RM	7	0,6	1,0	0,30	1,5	19,0	20,3	22,5	626
8 x 2 x 1,5RM	7	0,6	1,0	0,30	1,5	21,0	22,3	25,0	705
10 x 2 x 1,5RM	7	0,6	1,0	0,30	1,6	23,5	25,0	27,5	852
12 x 2 x 1,5RM	7	0,6	1,0	0,30	1,6	24,0	25,8	28,5	935
14 x 2 x 1,5RM	7	0,6	1,0	0,30	1,7	25,5	27,1	30,0	1036
16 x 2 x 1,5RM	7	0,6	1,0	0,30	1,7	26,5	28,4	31,5	1151
19 x 2 x 1,5RM	7	0,6	1,0	0,30	1,8	28,0	30,0	33,0	1290
20 x 2 x 1,5RM	7	0,6	1,0	0,30	1,8	29,5	31,5	34,5	1341
24 x 2 x 1,5RM	7	0,6	1,2	0,30	2,0	33,0	35,4	39,0	1623
37 x 2 x 1,5RM	7	0,6	1,2	0,40	2,2	38,0	40,8	44,5	2290
1 x 3 x 1,5RM	7	0,6	1,0	0,20	1,1	10,5	11,4	13,0	211
2 x 3 x 1,5RM	7	0,6	1,0	0,20	1,1	14,5	15,8	18,0	334
3 x 3 x 1,5RM	7	0,6	1,0	0,30	1,4	16,5	17,7	20,0	485
4 x 3 x 1,5RM	7	0,6	1,0	0,30	1,4	18,0	19,0	21,5	552
7 x 3 x 1,5RM	7	0,6	1,0	0,30	1,5	21,0	22,3	25,0	793
8 x 3 x 1,5RM	7	0,6	1,0	0,30	1,6	23,0	24,8	27,5	922
12 x 3 x 1,5RM	7	0,6	1,0	0,30	1,8	27,0	28,9	32,0	1234
16 x 3 x 1,5RM	7	0,6	1,0	0,30	1,9	30,0	32,0	35,0	1507
2 x 2 x 2,5RM*	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: 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
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 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
	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	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 µSmm^{-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 sheath	Overall diameter			Approximate net weight of cables
					Min.	Nom.	Max.	
n x mm^2	n	mm	mm	mm	mm			kg/km
1 x 2 x 0,5	7	0,4	0,1	1,0	5,4	6,2	6,6	45
2 x 2 x 0,5*	7	0,4	0,1	1,0	6,0	7,0	7,4	63
4 x 2 x 0,5	7	0,4	0,1	1,1	8,6	10,0	10,5	109
7 x 2 x 0,5	7	0,4	0,1	1,1	10,0	11,7	12,5	159
10 x 2 x 0,5	7	0,4	0,1	1,2	13,0	14,8	15,5	223
12 x 2 x 0,5	7	0,4	0,1	1,2	13,5	15,3	16,0	252
14 x 2 x 0,5	7	0,4	0,1	1,3	14,0	16,3	17,0	290
19 x 2 x 0,5	7	0,4	0,1	1,3	15,5	18,0	19,0	367
24 x 2 x 0,5	7	0,4	0,1	1,4	18,5	21,2	22,0	463
37 x 2 x 0,5	7	0,4	0,1	1,5	21,5	24,3	25,5	665
1 x 2 x 0,75	7	0,5	0,1	1,0	6,2	7,0	7,8	57
2 x 2 x 0,75*	7	0,5	0,1	1,0	7,0	7,9	8,8	82
4 x 2 x 0,75	7	0,5	0,1	1,1	10,5	11,5	12,5	144
7 x 2 x 0,75	7	0,5	0,1	1,2	12,5	13,8	15,0	221
8 x 2 x 0,75	7	0,5	0,1	1,3	14,0	15,6	17,0	258
10 x 2 x 0,75	7	0,5	0,1	1,3	16,0	17,6	19,5	310
12 x 2 x 0,75	7	0,5	0,1	1,4	16,5	18,4	20,0	361
14 x 2 x 0,75	7	0,5	0,1	1,4	17,5	19,3	21,0	406
19 x 2 x 0,75	7	0,5	0,1	1,5	19,5	21,6	23,5	527
20 x 2 x 0,75	7	0,5	0,1	1,5	21,0	22,8	25,0	556
24 x 2 x 0,75	7	0,5	0,1	1,6	23,0	25,4	27,5	664
37 x 2 x 0,75	7	0,5	0,1	1,7	26,5	29,2	32,0	955
1 x 2 x 1,5	7	0,6	0,1	1,0	7,2	8,3	9,0	84
2 x 2 x 1,5*	7	0,6	0,1	1,1	8,6	9,7	10,5	132
4 x 2 x 1,5	7	0,6	0,1	1,2	12,5	14,4	15,5	237
7 x 2 x 1,5	7	0,6	0,1	1,3	15,0	17,3	18,5	371
8 x 2 x 1,5	7	0,6	0,1	1,4	17,5	19,6	21,0	432
10 x 2 x 1,5	7	0,6	0,1	1,5	20,0	22,4	24,0	534
12 x 2 x 1,5	7	0,6	0,1	1,5	20,5	23,1	24,5	612
14 x 2 x 1,5	7	0,6	0,1	1,6	21,5	24,5	26,0	705
16 x 2 x 1,5	7	0,6	0,1	1,6	23,0	25,8	27,5	788
19 x 2 x 1,5	7	0,6	0,1	1,7	24,5	27,4	29,0	921
20 x 2 x 1,5	7	0,6	0,1	1,7	26,0	29,0	31,0	971
24 x 2 x 1,5	7	0,6	0,1	1,8	29,0	32,3	34,5	1159
37 x 2 x 1,5	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
2 x 0,75	7	0,5	0,1	1,0	6,2	7,0	7,8	57
3 x 0,75	7	0,5	0,1	1,0	6,6	7,4	8,2	68
4 x 0,75	7	0,5	0,1	1,0	7,0	7,9	8,8	81
5 x 0,75	7	0,5	0,1	1,0	7,6	8,5	9,4	96
6 x 0,75	7	0,5	0,1	1,0	8,2	9,2	10,0	111
7 x 0,75	7	0,5	0,1	1,0	8,2	9,2	10,0	117
10 x 0,75	7	0,5	0,1	1,1	10,5	11,6	13,0	163
12 x 0,75	7	0,5	0,1	1,1	10,5	11,9	13,0	184
14 x 0,75	7	0,5	0,1	1,2	11,5	12,7	14,0	213
16 x 0,75	7	0,5	0,1	1,2	12,0	13,3	14,5	238
18 x 0,75	7	0,5	0,1	1,2	12,5	14,0	15,5	263
19 x 0,75	7	0,5	0,1	1,2	12,5	14,0	15,5	269
24 x 0,75	7	0,5	0,1	1,3	15,0	16,4	18,0	339
25 x 0,75	7	0,5	0,1	1,3	15,0	16,4	18,0	348
27 x 0,75	7	0,5	0,1	1,3	15,0	16,7	18,5	369
32 x 0,75	7	0,5	0,1	1,3	16,0	17,9	19,5	427
37 x 0,75	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
1 x 2 x 0,5	0,21	0,4	0,1	1,0	5,4	6,2	6,6	45
2 x 2 x 0,5*	0,21	0,4	0,1	1,0	6,0	7,0	7,4	62
4 x 2 x 0,5	0,21	0,4	0,1	1,1	8,6	10,0	10,5	108
7 x 2 x 0,5	0,21	0,4	0,1	1,1	10,0	11,7	12,5	156
10 x 2 x 0,5	0,21	0,4	0,1	1,2	13,0	14,9	15,5	219
12 x 2 x 0,5	0,21	0,4	0,1	1,2	13,5	15,4	16,0	247
14 x 2 x 0,5	0,21	0,4	0,1	1,3	14,0	16,3	17,0	284
19 x 2 x 0,5	0,21	0,4	0,1	1,3	15,5	18,1	19,0	359
24 x 2 x 0,5	0,21	0,4	0,1	1,4	18,5	21,2	22,0	453
37 x 2 x 0,5	0,21	0,4	0,1	1,5	21,5	24,4	25,5	649
1 x 2 x 0,75	0,21	0,5	0,1	1,0	6,2	7,1	7,8	57
2 x 2 x 0,75*	0,21	0,5	0,1	1,0	7,0	8,1	8,8	82
4 x 2 x 0,75	0,21	0,5	0,1	1,1	10,5	11,8	12,5	145

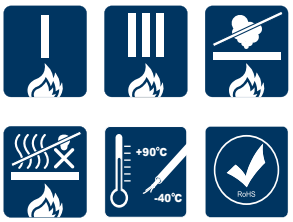
Number and cross-sectional area of conductor	Maximum diameter of wires in conductor class 5 Min.	Nominal thickness of insulation Nom.	Thickness of tape Min.	Nominal thickness of sheath	Overall diameter			Approximate net weight of cables
					Min.	Nom.	Max.	
n x mm²	n	mm	mm	mm	mm			kg/km
7 x 2 x 0,75	0,21	0,5	0,1	1,2	12,5	14,1	15,0	221
8 x 2 x 0,75	0,21	0,5	0,1	1,3	14,0	16,0	17,0	258
10 x 2 x 0,75	0,21	0,5	0,1	1,3	16,0	18,0	19,5	310
12 x 2 x 0,75	0,21	0,5	0,1	1,4	16,5	18,8	20,0	360
14 x 2 x 0,75	0,21	0,5	0,1	1,4	17,5	19,8	21,0	405
19 x 2 x 0,75	0,21	0,5	0,1	1,5	19,5	22,2	23,5	525
20 x 2 x 0,75	0,21	0,5	0,1	1,5	21,0	23,4	25,0	554
24 x 2 x 0,75	0,21	0,5	0,1	1,6	23,0	26,1	27,5	661
37 x 2 x 0,75	0,21	0,5	0,1	1,7	26,5	30,0	32,0	949
1 x 2 x 1,5	0,26	0,6	0,1	1,0	7,2	8,2	9,0	80
2 x 2 x 1,5*	0,26	0,6	0,1	1,1	8,6	9,6	10,5	126
4 x 2 x 1,5	0,26	0,6	0,1	1,2	12,5	14,1	15,5	225
7 x 2 x 1,5	0,26	0,6	0,1	1,3	15,0	17,0	18,5	350
8 x 2 x 1,5	0,26	0,6	0,1	1,4	17,5	19,3	21,0	407
10 x 2 x 1,5	0,26	0,6	0,1	1,5	20,0	22,0	24,0	504
12 x 2 x 1,5	0,26	0,6	0,1	1,5	20,5	22,7	24,5	576
14 x 2 x 1,5	0,26	0,6	0,1	1,6	21,5	24,1	26,0	663
16 x 2 x 1,5	0,26	0,6	0,1	1,6	23,0	25,4	27,5	741
19 x 2 x 1,5	0,26	0,6	0,1	1,7	24,5	27,0	29,0	864
20 x 2 x 1,5	0,26	0,6	0,1	1,7	26,0	28,5	31,0	912
24 x 2 x 1,5	0,26	0,6	0,1	1,8	29,0	31,8	34,5	1088
37 x 2 x 1,5	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 mm^2	n	mm	mm	mm	mm			kg/km
2 x 0,75	0,21	0,5	0,1	1,0	6,2	7,1	7,8	57
3 x 0,75	0,21	0,5	0,1	1,0	6,6	7,5	8,2	69
4 x 0,75	0,21	0,5	0,1	1,0	7,0	8,1	8,8	81
5 x 0,75	0,21	0,5	0,1	1,0	7,6	8,7	9,4	96
6 x 0,75	0,21	0,5	0,1	1,0	8,2	9,4	10,0	112
7 x 0,75	0,21	0,5	0,1	1,0	8,2	9,4	10,0	117
10 x 0,75	0,21	0,5	0,1	1,1	10,5	11,9	13,0	163
12 x 0,75	0,21	0,5	0,1	1,1	10,5	12,2	13,0	184
14 x 0,75	0,21	0,5	0,1	1,2	11,5	13,0	14,0	212
16 x 0,75	0,21	0,5	0,1	1,2	12,0	13,6	14,5	237
18 x 0,75	0,21	0,5	0,1	1,2	12,5	14,3	15,5	262
19 x 0,75	0,21	0,5	0,1	1,2	12,5	14,3	15,5	268
24 x 0,75	0,21	0,5	0,1	1,3	15,0	16,8	18,0	337
25 x 0,75	0,21	0,5	0,1	1,3	15,0	16,8	18,0	347
27 x 0,75	0,21	0,5	0,1	1,3	15,0	17,1	18,5	368
32 x 0,75	0,21	0,5	0,1	1,3	16,0	18,4	19,5	425
37 x 0,75	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: IEC 60092-376

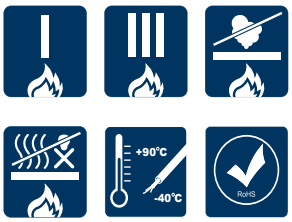
CONSTRUCTION	
Conductors	Circular stranded copper class 2 acc. to IEC 60228
Insulation	Cross-linked polyethylene HF-XLPE 90°C acc. to IEC 60092-351
Individually pair screen	Of aluminium/polyester tape with the metallic contact with a tinned copper drain wire
Inner covering	Lapped with non-hygroscopic 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 IEC 60092-359
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	IEC 60332-3-22 Category A/F
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 µSmm^{-1}
Application	Cables are designed for control and instrumentation circuits on ships and offshore units. The are intended for fixed installations. This 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 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
1 x 2 x 0,75RM	7	0,5	0,1	0,20	1,0	7,2	8,2	8,8	97
2 x 2 x 0,75RM	7	0,5	0,1	0,20	1,1	10,5	12,2	13,0	172
3 x 2 x 0,75RM	7	0,5	0,1	0,20	1,2	11,0	13,1	13,5	208
4 x 2 x 0,75RM	7	0,5	0,1	0,20	1,2	12,0	14,2	15,0	249
5 x 2 x 0,75RM	7	0,5	0,1	0,20	1,2	13,0	15,4	16,0	290
7 x 2 x 0,75RM	7	0,5	0,1	0,30	1,3	15,0	17,3	18,0	413
10 x 2 x 0,75RM	7	0,5	0,1	0,30	1,4	18,5	21,8	22,5	549
12 x 2 x 0,75RM	7	0,5	0,1	0,30	1,5	19,5	22,7	23,5	634
14 x 2 x 0,75RM	7	0,5	0,1	0,30	1,5	20,5	23,8	24,5	695
16 x 2 x 0,75RM	7	0,5	0,1	0,30	1,5	21,5	25,0	25,5	783
17 x 2 x 0,75RM	7	0,5	0,1	0,30	1,6	22,5	26,5	27,0	832
19 x 2 x 0,75RM	7	0,5	0,1	0,30	1,6	22,5	26,5	27,0	884
24 x 2 x 0,75RM	7	0,5	0,1	0,30	1,7	26,5	31,0	31,5	1091
37 x 2 x 0,75RM	7	0,5	0,1	0,30	1,9	30,5	35,7	36,0	1556
1 x 3 x 0,75RM	7	0,5	0,1	0,20	1,0	7,6	8,6	9,2	114
3 x 3 x 0,75RM	7	0,5	0,1	0,20	1,4	12,5	14,7	15,5	267
7 x 3 x 0,75RM	7	0,5	0,1	0,30	1,4	16,5	19,3	20,0	504
12 x 3 x 0,75RM	7	0,5	0,1	0,30	1,5	21,5	25,1	25,5	799
16 x 3 x 0,75RM	7	0,5	0,1	0,30	1,6	24,0	28,0	28,5	978
1 x 2 x 1,5RM	7	0,6	0,1	0,20	1,0	8,2	9,6	10,0	131
2 x 2 x 1,5RM	7	0,6	0,1	0,20	1,2	12,5	14,8	15,5	241
3 x 2 x 1,5RM	7	0,6	0,1	0,20	1,2	13,0	15,6	16,0	300
4 x 2 x 1,5RM	7	0,6	0,1	0,30	1,3	15,0	17,7	18,5	418
7 x 2 x 1,5RM	7	0,6	0,1	0,30	1,4	18,0	21,1	21,5	604
8 x 2 x 1,5RM	7	0,6	0,1	0,30	1,5	20,0	23,8	24,0	696
10 x 2 x 1,5RM	7	0,6	0,1	0,30	1,6	23,0	27,0	27,5	850
12 x 2 x 1,5RM	7	0,6	0,1	0,30	1,6	23,5	27,9	28,0	949
14 x 2 x 1,5RM	7	0,6	0,1	0,30	1,7	25,0	29,4	29,5	1092
19 x 2 x 1,5RM	7	0,6	0,1	0,30	1,8	28,0	32,9	33,0	1391
24 x 2 x 1,5RM	7	0,6	0,1	0,30	2,0	33,0	38,7	39,0	1734
27 x 2 x 1,5RM	7	0,6	0,1	0,30	2,0	33,5	39,6	39,5	1913
1 x 3 x 1,5RM	7	0,6	0,1	0,20	1,1	8,8	10,2	11,0	162
2 x 3 x 1,5RM	7	0,6	0,1	0,30	1,3	14,5	16,9	17,5	361
3 x 3 x 1,5RM	7	0,6	0,1	0,30	1,3	15,5	17,9	18,5	429
4 x 3 x 1,5RM	7	0,6	0,1	0,30	1,4	17,0	19,7	20,5	532
7 x 3 x 1,5RM	7	0,6	0,1	0,30	1,5	20,0	23,6	24,0	780
8 x 3 x 1,5RM	7	0,6	0,1	0,30	1,6	22,5	26,6	27,0	904
12 x 3 x 1,5RM	7	0,6	0,1	0,30	1,7	26,5	31,2	31,5	1241
24 x 3 x 1,5RM	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: IEC 60092-376

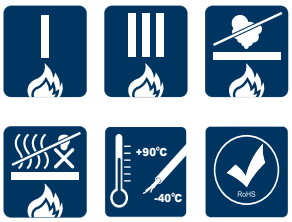
CONSTRUCTION	
Conductors	Circular stranded copper class 2 acc. to IEC 60228
Insulation	Cross-linked polyethylene HF-XLPE 90°C acc. to IEC 60092-351
Individually pair screen	Of aluminium/polyester tape with the metallic contact with a tinned copper drain wire
Inner covering	Extruded inner bedding of special 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 IEC 60092-359
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	IEC 60332-3-22 Category A/F
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 µSmm^{-1}
Application	Cables are designed for control and instrumentation circuits on ships and offshore units. The are intended for fixed installations. This 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 mm^2	n	mm	mm		mm		mm		kg/km
1 x 2 x 0,75RM	7	0,5	1,0	0,20	1,00	7,2	7,6	8,8	89
2 x 2 x 0,75RM	7	0,5	1,0	0,20	1,00	8,0	8,5	9,8	112
3 x 2 x 0,75RM	7	0,5	1,0	0,20	1,10	10,5	11,1	13,0	164
4 x 2 x 0,75RM	7	0,5	1,0	0,20	1,20	11,5	12,2	14,0	199
5 x 2 x 0,75RM	7	0,5	1,0	0,20	1,20	13,5	14,2	16,5	277
8 x 2 x 0,75RM	7	0,5	1,0	0,30	1,30	15,5	16,4	18,5	358
10 x 2 x 0,75RM	7	0,5	1,0	0,30	1,40	17,5	18,5	21,0	435
12 x 2 x 0,75RM	7	0,5	1,0	0,30	1,40	18,0	19,0	21,5	476
14 x 2 x 0,75RM	7	0,5	1,0	0,30	1,40	19,0	19,9	22,5	536
16 x 2 x 0,75RM	7	0,5	1,0	0,30	1,50	20,0	21,1	24,0	590
19 x 2 x 0,75RM	7	0,5	1,0	0,30	1,50	21,0	22,2	25,0	671
20 x 2 x 0,75RM	7	0,5	1,0	0,30	1,60	22,5	23,5	26,5	710
24 x 2 x 0,75RM	7	0,5	1,0	0,30	1,70	25,0	26,0	29,5	841
37 x 2 x 0,75RM	7	0,5	1,0	0,30	1,80	28,5	29,7	33,5	1151
1 x 3 x 0,75RM	7	0,5	1,0	0,20	1,00	7,6	8,0	9,2	100
3 x 3 x 0,75RM	7	0,5	1,0	0,20	1,20	11,5	12,4	14,0	212
7 x 3 x 0,75RM	7	0,5	1,0	0,30	1,30	15,5	16,3	18,5	404
12 x 3 x 0,75RM	7	0,5	1,0	0,30	1,50	20,5	21,3	24,5	629
1 x 2 x 1,5RM	7	0,6	1,0	0,20	1,1	10,0	11,5	12,5	190
2 x 2 x 1,5RM	7	0,6	1,0	0,30	1,3	15,0	17,1	18,0	400
3 x 2 x 1,5RM	7	0,6	1,0	0,30	1,3	16,0	18,0	19,0	451
4 x 2 x 1,5RM	7	0,6	1,0	0,30	1,4	17,0	19,6	20,5	540
7 x 2 x 1,5RM	7	0,6	1,0	0,30	1,5	20,0	23,0	24,0	744
8 x 2 x 1,5RM	7	0,6	1,0	0,30	1,6	22,5	25,7	26,5	860
10 x 2 x 1,5RM	7	0,6	1,0	0,30	1,7	25,0	28,9	29,5	1042
12 x 2 x 1,5RM	7	0,6	1,0	0,30	1,7	26,0	29,8	30,5	1142
14 x 2 x 1,5RM	7	0,6	1,0	0,30	1,8	27,0	31,3	32,0	1267
19 x 2 x 1,5RM	7	0,6	1,0	0,30	1,9	30,0	34,8	35,5	1586
24 x 2 x 1,5RM	7	0,6	1,2	0,40	2,1	36,0	41,5	42,0	2123
1 x 3 x 1,5RM	7	0,6	1,0	0,20	1,1	10,5	11,9	13,0	218
2 x 3 x 1,5RM	7	0,6	1,0	0,30	1,4	16,5	18,8	20,0	463
3 x 3 x 1,5RM	7	0,6	1,0	0,30	1,4	17,5	19,8	21,0	553
4 x 3 x 1,5RM	7	0,6	1,0	0,30	1,4	19,0	21,4	22,5	636
7 x 3 x 1,5RM	7	0,6	1,0	0,30	1,6	22,0	25,5	26,5	942
8 x 3 x 1,5RM	7	0,6	1,0	0,30	1,7	24,5	28,5	29,5	1083
12 x 3 x 1,5RM	7	0,6	1,0	0,30	1,8	28,5	33,1	34,0	1452
24 x 3 x 1,5RM	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: 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
Individually pair screen	Of aluminium/polyester tape with the metallic contact with a tinned copper drain wire
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 IEC 60092-359
Colour of Sheath	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	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 µSmm^{-1}
Application	Cables are designed for control and instrumentation circuits on ships and offshore units. The are intended for fixed installations. This 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

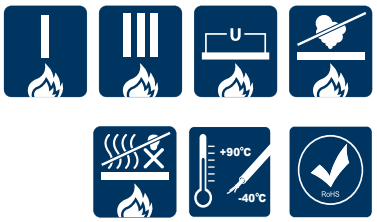
Conductor class 2

Number and cross-sectional area of conductor	Number of wires in conductor class 2	Nominal thickness of insulation	Thickness of tape	Nominal thickness of sheath	Overall diameter			Approximate net weight of cables
					Min.	Nom.	Max.	
n x mm²	n	mm	mm	mm	mm			kg/km
2 x 2 x 0,75RM	7	0,5	0,1	1,1	9,6	11,0	12,0	113
4 x 2 x 0,75RM	7	0,5	0,1	1,2	11,0	13,0	14,0	181
7 x 2 x 0,75RM	7	0,5	0,1	1,2	13,0	15,4	16,0	273
10 x 2 x 0,75RM	7	0,5	0,1	1,4	17,5	19,9	21,0	395
12 x 2 x 0,75RM	7	0,5	0,1	1,4	18,0	20,5	21,5	451
14 x 2 x 0,75RM	7	0,5	0,1	1,4	18,5	21,6	22,5	510
19 x 2 x 0,75RM	7	0,5	0,1	1,5	21,0	24,2	25,0	668
24 x 2 x 0,75RM	7	0,5	0,1	1,7	25,0	28,7	30,0	856

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 sheath	Overall diameter			Approximate net weight of cables
					Min.	Nom.	Max.	
n x mm²	n	mm	mm	mm	mm			kg/km
2 x 2 x 0,75RM	0,21	0,5	0,1	1,1	9,6	11,3	12,0	114
4 x 2 x 0,75RM	0,21	0,5	0,1	1,2	11,0	13,2	14,0	181
7 x 2 x 0,75RM	0,21	0,5	0,1	1,2	13,0	15,7	16,0	273
10 x 2 x 0,75RM	0,21	0,5	0,1	1,4	17,5	20,3	21,0	395
12 x 2 x 0,75RM	0,21	0,5	0,1	1,4	18,0	21,0	21,5	451
14 x 2 x 0,75RM	0,21	0,5	0,1	1,4	18,5	22,1	22,5	509
19 x 2 x 0,75RM	0,21	0,5	0,1	1,5	21,0	24,8	25,0	666
24 x 2 x 0,75RM	0,21	0,5	0,1	1,7	25,0	29,4	30,0	854

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



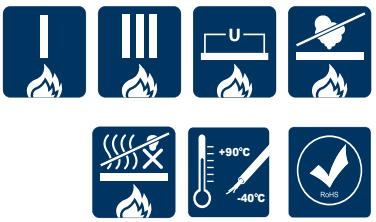
Halogen-free low smoke fire resistant shipboard instrumentation, control and telecommunications cables

Standard: IEC 60092-376

CONSTRUCTION	
Conductors	Circular stranded tinned copper class 5 acc. to IEC 60228
Insulation	Special cross-linked compound HF S 95 acc. to IEC 60092-351
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 IEC 60092-359
Colour 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	6 x D (D is the overall diameter of the cable)
Fire resistant	IEC 60331-21
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 µSmm^{-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 conductor	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 mm^2	mm	mm	mm	mm	mm			kg/km
1 x 2 x 1	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: IEC 60092-376

CONSTRUCTION		
Conductors	Circular stranded bare or tinned copper class 2 acc. to IEC 60228	
Insulation	Special cross-linked compound HF S 95 acc. to IEC 60092-351	
Inner covering	Lapped with tape or extruded bedding of special flame-retardant and halogen-free compound	
	Tape or inner beding	
Armour (screen)	Copper wire braiding with the metallic contact with a copper drain wire	
Sheath	Thermoplastic halogen free compound type SHF1 acc. to IEC 60092-359	
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	6 x D (D is the overall diameter of the cable)
Fire resistant	IEC 60331-21: for cable diameters ≤ 20 mm; IEC 60331-31: for cable diameters > 20 mm
Flame retardant	IEC 60332-3-22 Kategoria A/F
Smoke emission	IEC 61034-2
Gases evolved during combustion	IEC 60754-1: < 0,5% acid gas IEC 60754-2: pH ≥ 4,3; conductivity ≤ 10 μSmm^{-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, ABS, RINA, CLASSNK, BV

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 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
1 x 2 x 0,75	7	0,6	0,1	0,20	1,0	7,6	8,4	9,2	98
2 x 2 x 0,75*	7	0,6	0,1	0,20	1,1	8,6	9,6	10,5	138
3 x 2 x 0,75	7	0,6	0,1	0,20	1,2	11,0	12,6	13,5	201
4 x 2 x 0,75	7	0,6	0,1	0,20	1,2	12,0	13,7	15,0	239
7 x 2 x 0,75	7	0,6	0,1	0,30	1,3	15,0	16,7	18,0	377
10 x 2 x 0,75	7	0,6	0,1	0,30	1,4	19,0	21,0	22,5	520
12 x 2 x 0,75	7	0,6	0,1	0,30	1,5	19,5	21,9	23,5	582
14 x 2 x 0,75	7	0,6	0,1	0,30	1,5	20,5	22,9	24,5	654
19 x 2 x 0,75	7	0,6	0,1	0,30	1,6	23,0	25,5	27,0	828
20 x 2 x 0,75	7	0,6	0,1	0,30	1,6	24,0	26,8	28,5	863
24 x 2 x 0,75	7	0,6	0,1	0,30	1,7	26,5	29,8	31,5	1019
37 x 2 x 0,75	7	0,6	0,1	0,30	1,9	31,0	34,3	36,0	1417
1 x 3 x 0,75	7	0,6	0,1	0,20	1,0	8,0	8,8	9,6	117
1 x 4 x 0,75	7	0,6	0,1	0,20	1,1	8,6	9,6	10,5	138
2 x 2 x 1	7	0,6	0,1	0,20	1,0	7,6	8,7	9,4	113
2 x 2 x 1*	7	0,6	0,1	0,20	1,1	8,8	10,1	11,0	159
3 x 2 x 1	7	0,6	0,1	0,20	1,2	11,5	13,3	14,0	224
4 x 2 x 1	7	0,6	0,1	0,20	1,2	12,5	14,4	15,5	268
7 x 2 x 1	7	0,6	0,1	0,30	1,3	15,0	17,6	18,5	442
10 x 2 x 1	7	0,6	0,1	0,30	1,5	19,5	22,4	23,5	616
12 x 2 x 1	7	0,6	0,1	0,30	1,5	20,0	23,1	24,0	680
14 x 2 x 1	7	0,6	0,1	0,30	1,5	21,0	24,2	25,0	747
19 x 2 x 1	7	0,6	0,1	0,30	1,6	23,5	27,0	28,0	951
20 x 2 x 1	7	0,6	0,1	0,30	1,7	24,5	28,6	29,5	1032
24 x 2 x 1	7	0,6	0,1	0,30	1,8	27,5	31,7	33,0	1190
37 x 2 x 1	7	0,6	0,1	0,30	1,9	31,5	36,3	37,5	1679
1 x 3 x 1	7	0,6	0,1	0,20	1,0	8,0	9,2	9,8	129

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 mm^2	n	mm	mm	mm	mm	mm			kg/km
1 x 4 x 1	7	0,6	0,1	0,20	1,1	8,8	10,1	11,0	159
1 x 2 x 1,5	7	0,7	0,1	0,20	1,1	8,8	9,9	11,0	141
2 x 2 x 1,5*	7	0,7	0,1	0,20	1,1	10,0	11,2	12,0	197
3 x 2 x 1,5	7	0,7	0,1	0,30	1,3	14,0	15,6	16,5	334
4 x 2 x 1,5	7	0,7	0,1	0,30	1,3	15,0	17,0	18,0	385
7 x 2 x 1,5	7	0,7	0,1	0,30	1,4	18,0	20,2	21,5	576
8 x 2 x 1,5	7	0,7	0,1	0,30	1,5	20,0	22,7	24,0	664
10 x 2 x 1,5	7	0,7	0,1	0,30	1,6	22,5	25,8	27,0	809
12 x 2 x 1,5	7	0,7	0,1	0,30	1,6	23,5	26,6	28,0	900
14 x 2 x 1,5	7	0,7	0,1	0,30	1,7	25,0	28,1	29,5	1008
19 x 2 x 1,5	7	0,7	0,1	0,30	1,8	27,5	31,3	32,5	1286
20 x 2 x 1,5	7	0,7	0,1	0,30	1,8	29,0	33,0	34,5	1371
24 x 2 x 1,5	7	0,7	0,1	0,30	2,0	32,5	36,9	38,5	1633
37 x 2 x 1,5	7	0,7	0,1	0,40	2,2	38,0	42,9	44,5	2435
1 x 3 x 1,5	7	0,7	0,1	0,20	1,1	9,2	10,4	11,5	165
1 x 4 x 1,5	7	0,7	0,1	0,20	1,1	10,0	11,2	12,0	197
1 x 2 x 2,5	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 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 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.	
n x n x mm²	n	mm	mm		mm		mm		kg/km
1 x 2 x 1,5	7	0,7	1,0	0,20	1,1	10,5	11,7	13,0	211
2 x 2 x 1,5*	7	0,7	1,0	0,20	1,2	12,0	13,2	14,5	277
3 x 2 x 1,5	7	0,7	1,0	0,30	1,3	16,0	17,4	19,0	436
4 x 2 x 1,5	7	0,7	1,0	0,30	1,4	17,0	18,9	20,5	503
7 x 2 x 1,5	7	0,7	1,0	0,30	1,5	20,0	22,1	23,5	718
8 x 2 x 1,5	7	0,7	1,0	0,30	1,6	22,0	24,7	26,0	827
10 x 2 x 1,5	7	0,7	1,0	0,30	1,7	25,0	27,7	29,5	970
12 x 2 x 1,5	7	0,7	1,0	0,30	1,7	25,5	28,5	30,0	1095
14 x 2 x 1,5	7	0,7	1,0	0,30	1,8	27,0	30,0	31,5	1215
19 x 2 x 1,5	7	0,7	1,0	0,30	1,9	30,0	33,3	35,0	1511
20 x 2 x 1,5	7	0,7	1,0	0,30	1,9	31,5	35,0	36,5	1570
24 x 2 x 1,5	7	0,7	1,2	0,30	2,1	35,0	39,3	41,0	1895
37 x 2 x 1,5	7	0,7	1,2	0,40	2,3	40,5	45,3	47,5	2675
1 x 3 x 1,5	7	0,7	1,0	0,20	1,2	11,5	12,4	13,5	246
1 x 4 x 1,5	7	0,7	1,0	0,20	1,2	12,0	13,2	14,5	277
1 x 2 x 2,5	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

Shipboard instrumentation cables with elastomer insulated and sheathed, collectively screened

Standard: BS 6883

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 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
	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: 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 or 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 SW4
n x 2 x mm^2		mm	mm	mm	kg/km
1 x 2 x 0,75	5	0,8	1,0	7,9	80
3 x 2 x 0,75	5	0,8	1,2	13,9	196
7 x 2 x 0,75	5	0,8	1,4	18,8	386
12 x 2 x 0,75	5	0,8	1,6	24,4	635
20 x 2 x 0,75	5	0,8	1,9	31,1	1025
27 x 2 x 0,75	5	0,8	2,0	35,7	1341
37 x 2 x 0,75	5	0,8	2,2	41,4	1799
1 x 3 x 0,75	5	0,8	1,0	8,3	93
3 x 3 x 0,75	5	0,8	1,3	15,5	252
7 x 3 x 0,75	5	0,8	1,5	21,8	510
12 x 3 x 0,75	5	0,8	1,7	27,8	835
1 x 4 x 0,75	5	0,8	1,1	9,3	116
1 x 2 x 1	5	0,8	1,0	8,0	87
3 x 2 x 1	5	0,8	1,3	14,5	220
7 x 2 x 1	5	0,8	1,4	19,3	424
12 x 2 x 1	5	0,8	1,7	25,2	711
20 x 2 x 1	5	0,8	1,9	31,9	1131
27 x 2 x 1	5	0,8	2,1	36,8	1499
37 x 2 x 1	5	0,8	2,3	42,7	2011
1 x 3 x 1	5	0,8	1,1	8,7	105
3 x 3 x 1	5	0,8	1,3	15,9	277
7 x 3 x 1	5	0,8	1,5	22,4	565
12 x 3 x 1	5	0,8	1,8	28,7	942
1 x 4 x 1	5	0,8	1,1	9,5	127
1 x 2 x 1,5	5	0,8	1,3	9,3	115
1 x 4 x 1,5	5	0,8	1,4	10,8	169

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

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

Standard: BS 6883

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 or 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 SW4
n x 2 x mm^2		mm	mm	mm	kg/km
1 x 2 x 0,75	5	0,8	1,0	7,9	80
3 x 2 x 0,75	5	0,8	1,2	13,9	196
7 x 2 x 0,75	5	0,8	1,4	18,8	386
12 x 2 x 0,75	5	0,8	1,6	24,4	635
20 x 2 x 0,75	5	0,8	1,9	31,1	1025
27 x 2 x 0,75	5	0,8	2,0	35,7	1341
37 x 2 x 0,75	5	0,8	2,2	41,4	1799
1 x 3 x 0,75	5	0,8	1,0	8,3	93
3 x 3 x 0,75	5	0,8	1,3	15,5	252
7 x 3 x 0,75	5	0,8	1,5	21,8	510
12 x 3 x 0,75	5	0,8	1,7	27,8	835
1 x 4 x 0,75	5	0,8	1,1	9,3	116
1 x 2 x 1	5	0,8	1,0	8,0	87
3 x 2 x 1	5	0,8	1,3	14,5	220
7 x 2 x 1	5	0,8	1,4	19,3	424
12 x 2 x 1	5	0,8	1,7	25,2	711
20 x 2 x 1	5	0,8	1,9	31,9	1131
27 x 2 x 1	5	0,8	2,1	36,8	1499
37 x 2 x 1	5	0,8	2,3	42,7	2011
1 x 3 x 1	5	0,8	1,1	8,7	105
3 x 3 x 1	5	0,8	1,3	15,9	277
7 x 3 x 1	5	0,8	1,5	22,4	565
12 x 3 x 1	5	0,8	1,8	28,7	942
1 x 4 x 1	5	0,8	1,1	9,5	127
1 x 2 x 1,5	5	0,8	1,3	9,3	115
1 x 4 x 1,5	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: BS 6883

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	8 x D; 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 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
n x 2 x mm^2		mm	mm	mm	mm	mm	kg/km
2 x 2 x 0,75	5	0,8	1,2	0,30	1,4	13,7	292
3 x 2 x 0,75	5	0,8	1,2	0,30	1,4	17,1	383
4 x 2 x 0,75	5	0,8	1,4	0,30	1,5	18,9	458
5 x 2 x 0,75	5	0,8	1,4	0,30	1,5	20,2	514
6 x 2 x 0,75	5	0,8	1,4	0,30	1,5	21,6	575
7 x 2 x 0,75	5	0,8	1,4	0,30	1,5	21,6	602
10 x 2 x 0,75	5	0,8	1,6	0,30	1,7	25,9	826
12 x 2 x 0,75	5	0,8	1,6	0,30	1,7	26,8	884
14 x 2 x 0,75	5	0,8	1,8	0,45	2,0	30,0	1175
19 x 2 x 0,75	5	0,8	1,8	0,45	2,0	33,2	1382
20 x 2 x 0,75	5	0,8	1,8	0,45	2,0	33,8	1429
27 x 2 x 0,75	5	0,8	1,9	0,45	2,2	38,2	1793
37 x 2 x 0,75	5	0,8	2,1	0,45	2,3	43,5	2269
3 x 3 x 0,75	5	0,8	1,3	0,30	1,4	18,5	450
7 x 3 x 0,75	5	0,8	1,4	0,30	1,6	24,2	759
12 x 3 x 0,75	5	0,8	1,7	0,45	1,9	30,9	1284
3 x 2 x 1	5	0,8	1,2	0,30	1,4	17,4	403
5 x 2 x 1	5	0,8	1,4	0,30	1,6	20,8	555
7 x 2 x 1	5	0,8	1,4	0,30	1,6	22,2	654
10 x 2 x 1	5	0,8	1,6	0,30	1,8	26,7	888
12 x 2 x 1	5	0,8	1,6	0,30	1,8	27,7	984
20 x 2 x 1	5	0,8	1,8	0,45	2,1	34,8	1560
27 x 2 x 1	5	0,8	2,0	0,45	2,2	39,4	1963
30 x 2 x 1	5	0,8	2,2	0,45	2,4	41,7	2208
37 x 2 x 1	5	0,8	2,2	0,45	2,4	45,0	2516
3 x 3 x 1	5	0,8	1,3	0,30	1,5	19,0	487
7 x 3 x 1	5	0,8	1,5	0,30	1,7	25,2	847
12 x 3 x 1	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
n x 2 x mm^2		mm	mm	mm	mm	mm	kg/km
3 x 2 x 1,5	5	0,8	1,4	0,30	1,6	19,3	488
3 x 2 x 1,5	2	0,8	1,4	0,30	1,6	19,5	513
4 x 2 x 1,5	5	0,8	1,4	0,30	1,6	20,7	565
5 x 2 x 1,5	5	0,8	1,4	0,30	1,6	22,3	645
5 x 2 x 1,5	2	0,8	1,4	0,30	1,6	22,5	666
7 x 2 x 1,5	5	0,8	1,6	0,30	1,8	24,6	812
10 x 2 x 1,5	5	0,8	1,6	0,30	1,8	28,7	1052
10 x 2 x 1,5	2	0,8	1,6	0,30	1,8	29,0	1091
12 x 2 x 1,5	5	0,8	1,8	0,45	2,1	31,4	1351
12 x 2 x 1,5	2	0,8	1,8	0,45	2,1	31,8	1398
20 x 2 x 1,5	5	0,8	2,0	0,45	2,2	38,1	1923
20 x 2 x 1,5	2	0,8	2,0	0,45	2,2	38,6	1998
24 x 2 x 1,5	5	0,8	2,0	0,45	2,2	40,7	2197
30 x 2 x 1,5	2	0,8	2,1	0,45	2,4	45,4	2701
4 x 3 x 1,5	2	0,8	1,3	0,30	1,5	22,1	690
6 x 3 x 1,5	2	0,8	1,4	0,30	1,6	26,9	940
8 x 3 x 1,5	2	0,8	1,6	0,30	1,8	29,3	1173
12 x 3 x 1,5	5	0,8	1,7	0,45	1,9	34,0	1629
6 x 2 x 2,5	5	0,8	1,6	0,30	1,8	27,1	947
12 x 2 x 2,5	5	0,8	1,9	0,45	2,2	35,1	1703

TECHNICAL DATA

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	4 D
	> 25 mm	6 D
Metal braid screened or armoured	Any	6 D

Maximum pulling tension

Maximum pulling tension: 50 N x total cross-section of conductors.

Current ratings

Current ratings acc. to IEC 60092-352 based on ambient air temperature of 45°C

Nominal cross-sectional area	Insulation class temperature 90°C		
	1-core	2-cores	3-cores & 4-cores
mm^2	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 as 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 on cable trays, in cable conduits, pipes or trunking are expected to operate simultaneously full rated capacity, a correction factor of 0,85 should be applied.

Short circuit rating

Short circuit rating calculation based on formula:

$$\text{Short circuit current} = 226x\frac{S}{\sqrt{t}}x\sqrt{\ln\frac{234+T_k}{234+T_b}}$$

S = Cross-section of the conductor, mm²

t = Duration of the short circuit, s

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

T_b = 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 cable and maximum normal 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:
– individual Screen 90 nF/km
– collective screen 0,5 – 1 mm²: 65 nF/km
– collective screen 1,5 mm²: 70 nF/km

Classification Bureau	Type cables
ABS	FLAME-X 950 NKOGs
	FLAME-X 950 NTKOGsekw
	NKOXS
	NTKOXSekw (Multiparis)
	NTKOXSekf/ekw
	MVEPRHXCuHX
	MVEPRHXCuHX
	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)
	NHKOXSek
	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
	MVEPRHXCuHX (90°C;)

Classification Bureau	Type cables
BIURO VERITAS	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

Edition I

TELE-FONIKA Kable Sp. z o.o. S.K.A.

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