HELKAMA

THE PERFECT CONNECTION

INDUSTRIAL CABLES
OPTICAL FIBER CABLES

02/2022

Follow the lead - from design to manufacturing

Helkama specializes in the development and production of marine and telecom cables with experience in this field going back over fifty years. We provide solutions and manufacture different types of cables for Marine, Telecom, Industrial, Flexible, Offshore (SHF2), Optical fiber, Instrumentation and Fire-resistant applications. We export cables yearly to more than 60 countries worldwide, and we are known as a stable partner for several multinational corporations. Helkama stands for quality, flexibility and outstanding personal service.

Helkama Industrial Cables catalogue introduces our instrumentation, fire resistant, fiber optic, power and data cables suitable for industrial use and applications. Our range covers cables for both indoor and outdoor use, and all Helkama industrial cables are halogen-free.

Helkama R&D team is continuously developing and improving the product selection to better cater for today's diverse market demands. In addition to standard cables, Helkama also manufactures fully customized cables to suit customer specific requirements. Contact our sales team for more details and solutions for your project!

Together with our extensive stock, fast delivery times and exquisite customer service we will continue to grow and provide cable solutions to suit even the most demanding cabling needs now and in the future.

Contents

RE-2X(St)H PiMF

1 – 24 PAIRS
300 V

CONDUCTOR	Stranded copper conductor
INSULATION	XLPE
TWISTED PAIR	Two insulated cores twisted together
INDIVIDUAL SCREEN	Aluminium polyester tape and tinned copper drain wire
SCREEN	Aluminium polyester tape and tinned copper drain wire
SHEATH	LSZH Thermoplastic Standard colour black or blue
REFERENCE STANDARD	EN 50288-7

CE

RoHS

APPLICATION

Individually and collectively screened cable for instrumentation, control and communication applications. Suitable for direct burial use.

PHYSICAL PROPERTIES:

MIN. BENDING RADIUS	7.5 x Ø
CORE IDENTIFICATION	Colours white and black Numbers on white cores 1, 2...n – according to number of pairs

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	Fca
RATED VOLTAGE	300 V
UV RESISTANCE	UL1581 section 1200
MIN. INSTALLATION TEMPERATURE	-15 °C
OPERATING TEMPERATURE	-40 – 70 °C

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ELECTRICAL PROPERTIES:

Conductor area	0.5	0.75	1.0	1.3	1.5	Unit mm²
Conductor resistance, max.	39.2	24.6	18.1	14.2	12.6	ohm/km
Insulation resistance, min.	5000	5000	5000	5000	5000	Mohm x km
Mutual capacitance (800 Hz)						
Cable one pair, max.	120	120	120	120	120	nF/km
Cable 2 to 4 pairs, max.	100	100	100	100	100	nF/km
Cables > 4 pairs, max.	80	80	80	80	80	nF/km
L/R ratio, max.	14.5	25	33	41.5	47	µH/ohm
Inductance, max.	0.57	0.60	0.60	0.59	0.60	mH/km
Test voltage						
Conductor/conductor, min.	4000	4000	4000	4000	4000	VDC 30 s
Conductor/screen, min.	2000	2000	2000	2000	2000	VDC 30 s

RE-2X(St)H PiMF

No. of pairs	Nominal outer Ø	Weight kg/km	Nominal outer Ø	Weight kg/km	Nominal outer Ø	Weight kg/km	Nominal outer Ø	Weight kg/km	Nominal outer Ø	Weight kg/km
	0.5 mm²		0.75 mm²		1 mm²		1.3 mm²		1.5 mm²	
1	6.0	50	6.0	55	6.5	65	7.0	70	7.5	80
2	8.5	85	9.0	100	9.5	115	10.5	130	11.5	160
4	10.0	130	10.5	155	11.5	195	12.5	225	14.0	260
8	13.0	230	14.5	290	15.5	345	17.0	415	18.5	470
12	16.0	330	18.0	420	18.5	495	20.0	590	22.5	700
16	18.5	440	20.0	535	21.5	650	23.5	785	26.0	910
20	20.5	530	22.5	655	24.0	810	26.0	960	29.0	1120
24	22.5	630	24.5	790	26.5	960	28.5	1140	32.0	1345

Technical data of triples, other conductor dimensions and number of pairs will be stated on request.

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RE-2X(St)H

1 – 24 PAIRS
300 V

CONDUCTOR	Stranded copper conductor
INSULATION	XLPE
TWISTED PAIR	Two insulated cores twisted together
STRANDING	Tinned copper drain wire under the screen
SCREEN	Aluminium polyester tape and tinned copper drain wire
SHEATH	LSZH Thermoplastic Standard colour black or blue
REFERENCE STANDARD	EN 50288-7

APPLICATION

Collectively screened cable for instrumentation, control and communication applications. Suitable for direct burial use.

PHYSICAL PROPERTIES:

MIN. BENDING RADIUS	7.5 x Ø
CORE IDENTIFICATION	Colours white and black Numbers on white cores 1, 2...n – according to number of pairs

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	Fca
RATED VOLTAGE	300 V
UV RESISTANCE	UL1581 section 1200
MIN. INSTALLATION TEMPERATURE	-15 °C
OPERATING TEMPERATURE	-40 – 70 °C

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ELECTRICAL PROPERTIES:

Conductor area	0.5	0.75	1.0	1.3	1.5	Unit mm²
Conductor resistance, max.	39.2	24.6	18.1	14.2	12.6	ohm/km
Insulation resistance, min.	5000	5000	5000	5000	5000	Mohm x km
Mutual capacitance (800 Hz)						
Cable one pair, max.	120	120	120	120	120	nF/km
Cable 2 to 4 pairs, max.	100	100	100	100	100	nF/km
Cables > 4 pairs, max.	80	80	80	80	80	nF/km
L/R ratio, max.	14.5	25	33	41.5	47	µH/ohm
Inductance, max.	0.57	0.60	0.60	0.59	0.60	mH/km
Test voltage						
Conductor/conductor, min.	4000	4000	4000	4000	4000	VDC 30 s
Conductor/screen, min.	2000	2000	2000	2000	2000	VDC 30 s

RE-2X(ST)H

No. of pairs	Nominal outer Ø	Weight kg/km	Nominal outer Ø	Weight kg/km	Nominal outer Ø	Weight kg/km	Nominal outer Ø	Weight kg/km	Nominal outer Ø	Weight kg/km
	0.5 mm²		0.75 mm²		1 mm²		1.3 mm²		1.5 mm²	
1	5.5	40	6.0	50	6.5	55	6.5	65	7.5	75
2	8.0	65	8.5	80	9.5	100	10.0	115	11.0	130
3	8.5	80	9.5	105	10.0	130	10.5	145	11.5	170
4	9.0	95	10.0	125	11.0	155	11.5	185	13.5	225
8	12.0	165	13.5	225	14.5	285	15.5	340	17.0	400
12	14.5	245	16.0	320	17.0	410	19.5	500	20.5	575
16	16.5	315	18.0	405	19.5	530	22.0	635	23.5	745
20	18.0	375	20.0	500	21.5	645	24.5	785	26.5	935
24	19.5	445	21.5	590	23.5	765	27.0	945	28.5	1105

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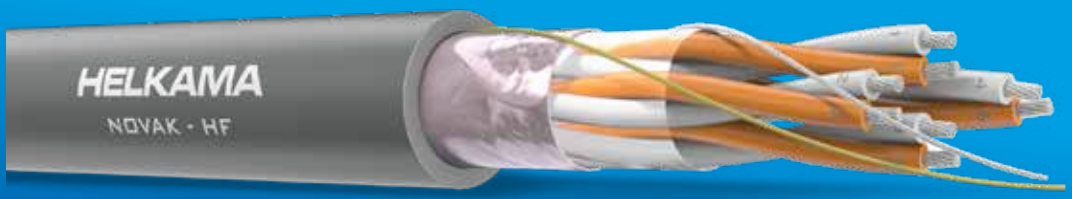
NOVAK-HF

75 V



CONDUCTOR	Tinned copper conductor
INSULATION	PE
TWISTED PAIR	Two cores twisted together Each pair with different lay
STRANDING	Units of 4 pairs cabled together
SCREEN	Aluminium polyester tape and tinned copper drain wire
SHEATH	LSZH Thermoplastic Standard colour light grey
REFERENCE STANDARD	EN 50288-7

APPLICATION

Cable for instrumentation, process control and computer systems. For fixed installation.

PHYSICAL PROPERTIES:

MIN. BENDING RADIUS (installation/fixed)	9 x Ø/6 x Ø
CORE IDENTIFICATION	Pair colours white and orange Pair identification with colour code and identification number Unit identification with numbered tape

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	Dca s2, d2, a1
RATED VOLTAGE	75 V
UV RESISTANCE	UL1581 section 1200
MIN. INSTALLATION TEMPERATURE	-15 °C
OPERATING TEMPERATURE	-40 – 70 °C

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ELECTRICAL PROPERTIES:

		Unit
Pair loop resistance (20 °C), max.	81	ohm/km
Nominal pair capacitance (800 Hz)	80	nF/km
Loop inductance	0.6	mH/km
Insulation resistance (20 °C), min.	100	Mohm/km

NOVAK-HF

Part number	No. of conductors x Conductor area (mm^2)	Nominal outer Ø mm	Weight kg/km
3150103022	2 x 2 x 0.5 + 0.5 mm^2	7.0	55
3150103042	4 x 2 x 0.5 + 0.5 mm^2	8.0	80
3150103082	8 x 2 x 0.5 + 0.5 mm^2	11.0	145
3150103122	12 x 2 x 0.5 + 0.5 mm^2	12.0	205
3150103242	24 x 2 x 0.5 + 0.5 mm^2	17.0	375

Standard length 1000 m

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KJAAM-HF

75 V

CONDUCTOR	Tinned copper conductor
INSULATION	PE
TWISTED PAIR	Two insulated cores twisted together
INDIVIDUAL SCREEN	Aluminium polyester tape and tinned copper drain wire
SCREEN	Aluminium polyester tape and tinned copper drain wire
SHEATH	LSZH Thermoplastic Standard colour light grey
REFERENCE STANDARD	EN 50288-7

APPLICATION

Cable for instrumentation, process control, computer and sound reproduction systems. Designed for transmission of digital and low-level analog signals, provides excellent protection against electromagnetic interference. For fixed installation.

PHYSICAL PROPERTIES:

MIN. BENDING RADIUS (installation/fixed)	9 x Ø/6 x Ø
CORE IDENTIFICATION	Pair colours blue/red Pair identification on numbered tape over pairs

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	Dca s2, d2, a1
RATED VOLTAGE	75 V
UV RESISTANCE	UL1581 section 1200
MIN. INSTALLATION TEMPERATURE	-15 °C
OPERATING TEMPERATURE	-40 – 70 °C

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ELECTRICAL PROPERTIES:

		Unit
Pair DC resistance (20 °C), max.	81	ohm/km
Nominal pair capacitance (800 Hz)	100	nF/km
Loop inductance	0.6	mH/km
Insulation resistance, min.	2000	Mohm/km

KJAAM-HF

Part number	No. of conductors x Conductor area (mm²)	Nominal outer Ø mm	Weight kg/km
3050103012	1 x (2+1) x 0.5	4.8	33
3050103022	2 x (2+1) x 0.5 + 0.5	8.0	70
3050103042	4 x (2+1) x 0.5 + 0.5	10.0	120
3050103082	8 x (2+1) x 0.5 + 0.5	12.6	205
3050103122	12 x (2+1) x 0.5 + 0.5	15.1	286
3050103242	24 x (2+1) x 0.5 + 0.5	20.2	522

Standard length 1000 m

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KJAAM-HF GM

75 V

CONDUCTOR	Tinned copper conductor
INSULATION	PE
TWISTED PAIR	Two insulated cores twisted together
INDIVIDUAL SCREEN	Aluminium polyester tape and tinned copper drain wire
SCREEN	Aluminium polyester tape and tinned copper drain wire
INNER SHEATH	LSZH Thermoplastic Standard colour light grey
ARMOUR	Two galvanized steel tapes
SHEATH	LSZH Thermoplastic Standard colour black

APPLICATION

Cable for instrumentation, process control, computer and sound reproduction systems. Designed for transmission of digital and low-level analog signals, provides excellent protection against electromagnetic interference. Armoured with galvanized steel tapes. For fixed installation.

PHYSICAL PROPERTIES:

MIN. BENDING RADIUS (installation/fixed)	15 x Ø/10 x Ø
CORE IDENTIFICATION	Pair colours blue/red Pair identification on numbered tape over pairs

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	Fca IEC 60332-1-2 IEC 60332-3-22
RATED VOLTAGE	75 V
UV RESISTANCE	UL1581 section 1200
MIN. INSTALLATION TEMPERATURE	-15 °C
OPERATING TEMPERATURE	-40 – 70 °C

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ELECTRICAL PROPERTIES:

		Unit
Pair DC resistance (20 °C), max.	81	ohm/km
Nominal pair capacitance (800 Hz)	100	nF/km
Loop inductance	0.6	mH/km
Insulation resistance, min.	2000	Mohm/km

KJAAM-HF GM

Part number	No. of conductors x Conductor area (mm²)	Nominal outer Ø mm	Weight kg/km
30212	4 x (2+1) x 0.5 + 0.5	13.2	257
30214	8 x (2+1) x 0.5 + 0.5	16.3	380
30216	12 x (2+1) x 0.5 + 0.5	19.1	527
30218	24 x (2+1) x 0.5 + 0.5	25.2	868

Standard length 1000 m

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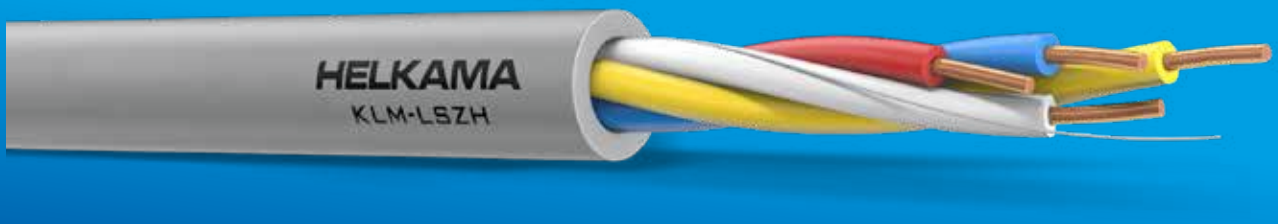
KLM-LSZH

75 V



CONDUCTOR	Solid copper conductor
INSULATION	PE
STRANDING	Conductors twisted together
SHEATH	LSZH Thermoplastic Standard colour light grey
REFERENCE STANDARD	EN 50288-7, SFS 2751

APPLICATION

Cable for instrumentation, alarm systems and personal call finders. For fixed installation.

PHYSICAL PROPERTIES:

MIN. BENDING RADIUS (installation/fixed)	15 x Ø/10 x Ø
CORE IDENTIFICATION	1. Blue 2. Yellow 3. White 4. Red

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	Dca, s2, d2, a1 IEC 60332-1-2
RATED VOLTAGE	75 V
MIN. INSTALLATION TEMPERATURE	-5 °C
OPERATING TEMPERATURE	-5 – 70 °C

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ELECTRICAL PROPERTIES:

		Unit
Loop resistance (20 °C), max.	73.4	ohm/km
Insulation resistance, min.	> 500	Mohm x km
Test voltage DC 60 s		
Conductor/Conductor	2.25	kV

KLM-LSZH

Part number	No. of conductors x Conductor area (mm²)	Nominal outer Ø mm	Weight kg/km	Standard length m	
3400225020	2 x 0.8 + 0.8	3.8 ± 0.3	19	150	box
3402225020	2 x 0.8 + 0.8	3.8 ± 0.3	19	600	drum
3400225040	4 x 0.8 + 0.8	4.4 ± 0.3	32	150	box
3402225040	4 x 0.8 + 0.8	4.4 ± 0.3	32	600	drum

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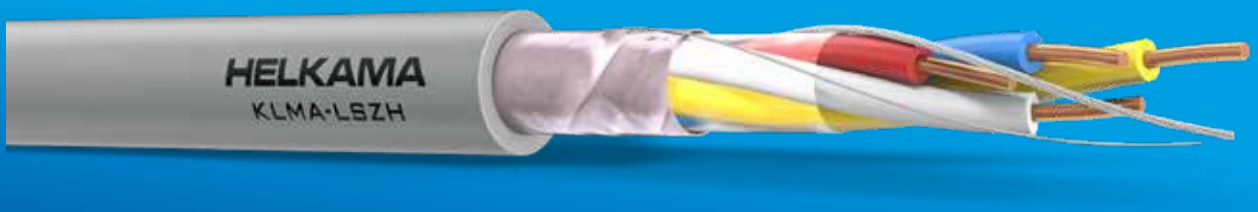
KLMA-LSZH

75 V



CONDUCTOR	Solid copper conductor
INSULATION	PE
STRANDING	Conductors twisted together Solid tinned copper drain wire under screen
SCREEN	Aluminium polyester tape
SHEATH	LSZH Thermoplastic Standard colour light grey
REFERENCE STANDARD	EN 50288-7, SFS 2755

APPLICATION

Cable for instrumentation, alarm systems and personal call finders. For fixed installation.

PHYSICAL PROPERTIES:

MIN. BENDING RADIUS (installation/fixed)	15 x Ø/10 x Ø
CORE IDENTIFICATION	1. Blue 2. Yellow 3. White 4. Red

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	Dca, s2, d1, a1 IEC 60332-1-2
RATED VOLTAGE	75 V
MIN. INSTALLATION TEMPERATURE	-5 °C
OPERATING TEMPERATURE	-5 – 70 °C

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ELECTRICAL PROPERTIES:

		Unit
Loop resistance (20 °C), max.	73.4	ohm/km
Insulation resistance, min.	> 500	Mohm x km
Test voltage DC 60 s		
Conductor/Conductor	2.25	kV
Conductor/Screen	1.5	kV

KLMA-LSZH

Part number	No. of conductors x Conductor area (mm²)	Nominal outer Ø mm	Weight kg/km	Standard length m	
3410225020	2 x 0.8 + 0.8	3.9 ± 0.3	25	150	box
3412225020	2 x 0.8 + 0.8	3.9 ± 0.3	25	600	drum
3410225040	4 x 0.8 + 0.8	4.5 ± 0.3	37	150	box
3412225040	4 x 0.8 + 0.8	4.5 ± 0.3	37	600	drum

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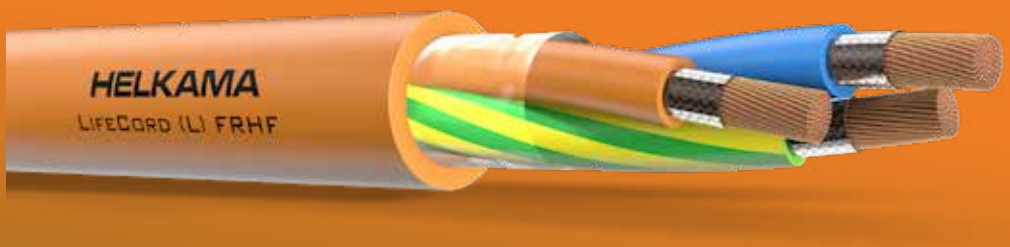
LIFECORD (L) FRHF

0.6/1 kV



CONDUCTOR	1.5 mm² solid copper conductor >1.5 mm² stranded copper conductor
INSULATION	Mica tape XLPE
STRANDING	Conductors twisted together
SHEATH	LSZH Thermoplastic Standard colour orange
REFERENCE STANDARD	IEC 60092-353

APPLICATION

Fire-resistant unarmoured power and control cable 0.6/1 kV. For fixed installation.

PHYSICAL PROPERTIES:

MIN. BENDING RADIUS (installation/fixed)	9 x Ø/6 x Ø
CORE IDENTIFICATION	2 cores blue and brown 3 cores blue, brown and yellow/green 5 cores blue, brown, black, grey and yellow/green 7-27 cores black numbers on white base

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	IEC 60332-1-2 IEC 60332-3-22
RATED VOLTAGE	AC 0.6/1 kV (1.2 kV) DC 0.9/1.5 kV (if voltage to earth does not exceed 0.9 kV)
FIRE-RESISTANT	IEC 60331-21
HALOGEN-FREE	IEC 60754 series
SMOKE EMISSION	IEC 61034 series
MIN. INSTALLATION TEMPERATURE	-15 °C
OPERATING TEMPERATURE	-40 – 90 °C (short cirquit max 5 s duration 250 °C)

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LIFECORD (L) FRHF

Part number		No. of conductors x Conductor area (mm²)	Nominal outer Ø mm	Weight kg/km
Normal	G-type			
75400		2 x 1.5	8.5	80
75401		2 x 2.5	10.0	120
75402		2 x 6	13.0	260
75403		2 x 10	15.0	385
75410	75411	3 x 1.5	9.0	105
75412	75413	3 x 2.5	10.5	150
75414	75415	3 x 6	14.0	330
75416	75417	3 x 10	16.0	485
75430	75431	5 x 1.5	11.0	165
75432	75433	5 x 2.5	12.5	225
75434	75435	5 x 6	16.7	496
75436	75437	5 x 10	19.5	736
75438		7 x 1.5	12.0	207
75439		7 x 2.5	14.0	295
75440		12 x 1.5	16.0	342
75441		12 x 2.5	18.3	480
75442		19 x 1.5	18.4	505
75443		19 x 2.5	21.6	718
75444		27 x 1.5	22.4	712
75445		27 x 2.5	26.5	1025

Standard length 500 m

G-type with yellow/green earth conductor and G-marking on sheath e.g. 3G1.5

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FIRELINE 750

500 V

CONDUCTOR	Solid or stranded copper conductor
INSULATION	Mica tape XLPE
STRANDING	Conductors cabled together Tinned copper drain wire under the screen
SCREEN	Aluminium polyester tape
SHEATH	LSZH Thermoplastic Standard colour red
REFERENCE STANDARD	EN 50288-7

APPLICATION

Fire-resistant collectively screened instrumentation and control cable. For fixed installation.

PHYSICAL PROPERTIES:

MIN. BENDING RADIUS (installation/fixed)	6 x Ø/4 x Ø
CORE IDENTIFICATION	2 cores blue and brown 3 cores brown, black and grey 4 cores blue, brown, black and grey 7-19 cores black numbers on white base

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	IEC 60332-1-2 IEC 60332-3-22
RATED VOLTAGE	500 V
FIRE-RESISTANT	IEC 60331-21
UV RESISTANT	IEC 60068-2-5
HALOGEN-FREE	IEC 60754 series
SMOKE EMISSION	IEC 61034 series
MIN. INSTALLATION TEMPERATURE	-15 °C
OPERATING TEMPERATURE	-40 - 70 °C
MAX. CONDUCTOR TEMPERATURE	90 °C

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ELECTRICAL PROPERTIES:

Conductor area	1	1.5	2.5	Unit mm²
Conductor resistance, (20 °C) max.	18.1	12.1	7.4	ohm/km
Capacitance (800 Hz)	70	80	87	nF/km
Loop inductance, max.	0.67	0.68	0.63	mH/km

FIRELINE 750

Part number	No. of conductors x Conductor area (mm²)	Nominal outer Ø mm	Weight kg/km
75001	2 x 1.0	7.5	80
75002	3 x 1.0	7.9	90
75003	4 x 1.0	8.5	105
75004	7 x 1.0	10.0	150
75005	12 x 1.0	13.0	240
---	19 x 1.0	15.5	340
75011	2 x 1.5	8.0	95
75012	3 x 1.5	8.5	110
75022	3 x 1.5 S*	8.5	110
75013	4 x 1.5	9.2	130
75014	7 x 1.5	11.0	195
75015	12 x 1.5	14.2	305
75016	19 x 1.5	16.5	450
75021	2 x 2.5	9.5	135
75112	3 x 2.5	9.8	155
75023	4 x 2.5	10.6	185
75024	7 x 2.5	12.6	280
75025	12 x 2.5	16.8	450
---	19 x 2.5	20.0	680

Standard length 1000 m

* S = G-type, with yellow/green earth conductor and G-marking on sheath 3G1.5
Core identification black, blue, yellow/green

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LIFECORD-FRHF

300 V

CONDUCTOR	Stranded copper conductor
INSULATION	Mica tape XLPE
STRANDING	Pairs cabled together Tinned copper drain wire under the screen
SCREEN	Aluminium polyester tape, coverage 100%
SHEATH	LSZH Thermoplastic Standard colour orange
REFERENCE STANDARD	EN 50288-7

APPLICATION

Fire-resistant screened instrumentation and communication cable 300 V. For fixed installation where the cable has to maintain its functionality during fire.

PHYSICAL PROPERTIES:

MIN. BENDING RADIUS (installation/fixed)	9 x Ø/6 x Ø
CORE IDENTIFICATION	Pair colours white/blue Black identification numbers

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	IEC 60332-1-2 IEC 60332-3-22
RATED VOLTAGE	300 V
FIRE-RESISTANT	Ø < 20 mm IEC 60331-2 Ø > 20 mm IEC 60331-1
HALOGEN-FREE	IEC 60754 series
SMOKE EMISSION	IEC 61034 series
MIN. INSTALLATION TEMPERATURE	-15 °C
OPERATING TEMPERATURE	-40 – 90 °C

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ELECTRICAL PROPERTIES:

		Unit
Pair loop resistance (20 °C), max.	52	ohm/km
Nominal pair capacitance (800 Hz)	45	nF/km
Loop inductance	0.6	mH/km
Insulation resistance (20 °C), min.	≥1500	Mohm/km

LIFECORD-FRHF

Part number	No. of conductors x Conductor area (mm²)	Nominal outer Ø mm	Weight kg/km	Standard length m
0245130	1 x 2 x 0.75	8.5	75	1000
0245122	2 x 2 x 0.75	13.0	135	1000
0245124	4 x 2 x 0.75	15.5	215	1000
0245126	8 x 2 x 0.75	20.0	380	1000
0245127	12 x 2 x 0.75	24.0	545	1000
0245128	19 x 2 x 0.75	29.5	805	500
0245129	24 x 2 x 0.75	33.5	1030	500

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LIFECORD-FRHF (i)

300 V

CONDUCTOR	Stranded copper conductor
INSULATION	Mica tape XLPE
STRANDING	Pairs and copper drain wire cabled together
PAIR SCREEN	Aluminium polyester tape
SCREEN	Aluminium polyester tape, coverage 100% Tinned copper drain wire under the screen
SHEATH	LSZH Thermoplastic Standard colour orange
REFERENCE STANDARD	EN 50288-7

APPLICATION

Fire-resistant individually and collectively screened cable for instrumentation and communication applications.
For fixed installation where the cable has to maintain its functionality during fire.

PHYSICAL PROPERTIES:

MIN. BENDING RADIUS (installation/fixed)	9 x Ø/6 x Ø
CORE IDENTIFICATION	Pair colours white/blue Black identification numbers

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	IEC 60332-1-2 IEC 60332-3-22
RATED VOLTAGE	300 V
FIRE-RESISTANT	Ø < 20 mm IEC 60331-2 Ø > 20 mm IEC 60331-1
HALOGEN-FREE	IEC 60754 series
SMOKE EMISSION	IEC 61034 series
MIN. INSTALLATION TEMPERATURE	-15 °C
OPERATING TEMPERATURE	-40 - 90 °C

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ELECTRICAL PROPERTIES:

		Unit
Loop resistance of pair (20 °C), max.	52	ohm/km
Nominal pair capacitance (800 Hz)	55	nF/km
Loop inductance	0.6	mH/km
Insulation resistance (20 °C), min.	≥1500	Mohm/km

LIFECORD-FRHF (i)

Part number	No. of conductors x Conductor area (mm²)	Nominal outer Ø mm	Weight kg/km	Standard length m
0245140	1 x 2 x 0.75	8.3	85	1000
0245142	2 x 2 x 0.75	13.5	155	1000
0245144	4 x 2 x 0.75	15.5	245	1000
0245146	8 x 2 x 0.75	20.0	430	1000
0245147	12 x 2 x 0.75	24.5	625	1000
0245148	19 x 2 x 0.75	30.0	945	500
0245149	24 x 2 x 0.75	34.0	1205	500

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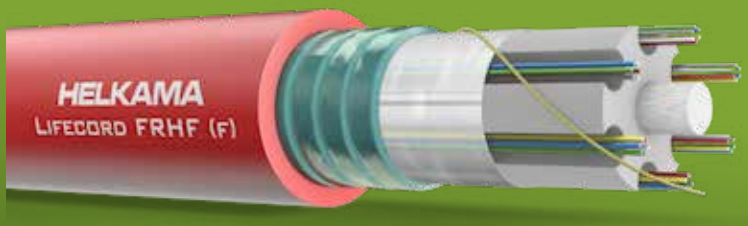
LIFECORD-FRHF (f)



CENTRAL ELEMENT	Glass fiber, Ø 3.3 mm
PP-SLOTTED CORE	Ø 8.0 mm
OPTICAL FIBERS	250 µm
WATER BLOCKING	Water swellable tape Corrugated steel tape
SHEATH	LSZH Thermoplastic Standard colour red
REFERENCE STANDARD	Helkama specification

APPLICATION

Fire-resistant optical fiber cable for indoor application. For fixed installation where the cable has to maintain its functionality during fire.

PHYSICAL PROPERTIES:

		Unit	Mechanical test
MAX PULLING FORCE	2500	N	IEC 60794-1-2 E1
CRUSH STRENGTH/ 100 mm (PLATE)	7000	N	IEC 60794-1-2 E3
CRUSH STRENGTH/ 25 mm (MANDREL)	1500	N	IEC 60794-1-2 E3
IMPACT STRENGTH	50	J	IEC 60794-1-2 E4
MIN. BENDING RADIUS (installation/fixed)	270/200	mm	
NOMINAL OUTER Ø	13.5	mm	
CABLE WEIGHT	196	kg/km	

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	IEC 60332-1-2 IEC 60332-3-22
FIRE-RESISTANT	IEC 60331-25
HALOGEN-FREE	IEC 60754 series
SMOKE EMISSION	IEC 61034 series
MIN. INSTALLATION TEMPERATURE	-15 °C
OPERATING TEMPERATURE	-30 – 70 °C

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LIFECORD-FRHF (f)

Part number	Cable type
15001	LifeCord FRHF 1 x 4 GKL
15005	LifeCord FRHF 1 x 4 SML
15006	LifeCord FRHF 1 x 6 SML
15008	LifeCord FRHF 2 x 6 SML
15012	LifeCord FRHF 4 x 6 SML
15020	LifeCord FRHF 1 x 4 SML + 2 x 4 GKL
15039	LifeCord FRHF 1 x 4 SML + 1 x 4 OM3L
15041	LifeCord FRHF 1 x 6 SML + 3 x 4 GKL
15043	LifeCord FRHF 2 x 6 SML + 3 x 4 GKL
15045	LifeCord FRHF 2 x 6 SML + 3 x 4 OM3L
15048	LifeCord FRHF 3 x 6 SML + 3 x 6 GKL
15062	LifeCord FRHF 2 x 4 GKL
15063	LifeCord FRHF 3 x 4 GKL
15066	LifeCord FRHF 6 x 4 GKL
15071	LifeCord FRHF 1 x 4 OM3L
15073	LifeCord FRHF 2 x 4 OM3L
15075	LifeCord FRHF 3 x 4 OM3L
15081	LifeCord FRHF 6 x 4 OM3L
15095	LifeCord FRHF 3 x 4 OM4L

Other types on request

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FXMSU

		Max 30 fibers	Max 48 fibers	Unit
CENTRAL ELEMENT, GLASS FIBER		1.5	3.3	Ø mm
PP-SLOTTED CORE		6.0	9.5	Ø mm
OPTICAL FIBERS		250	250	Ø µm
WRAPPING	Aramid binding yarn			
WATER BLOCKING	Water swellable tape			
SHEATH	LSZH Thermoplastic Standard colour orange			
REFERENCE STANDARD	Helkama specification			

APPLICATION

Optical fiber cable for indoor/outdoor application.

PHYSICAL PROPERTIES:

	Max 30 fibers	Max 48 fibers	Unit	Mechanical test
TENSILE STRENGTH	500	1750	N	EN 187000 method 501
CRUSH STRENGTH/ 100 mm (PLATE)	4000	4000	N	EN 187000 method 504
CRUSH STRENGTH/ 25 mm (MANDREL)	650	1000	N	EN 187000 method 504
IMPACT STRENGTH	25	50	J	EN 187000 method 505
LONGITUDINAL WATER TIGHTNESS				EN 18700 method 605B
MIN. BENDING RADIUS (installation/fixed)	15/10 x Ø	15/10 x Ø		
NOMINAL OUTER Ø	9.4	13.1	mm	
CABLE WEIGHT	75	146	kg/km	

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	Eca IEC 60332-1-2 IEC 60332-3-22
UV RESISTANCE	UL1581 section 1200
HALOGEN-FREE	IEC 60754-1
ACIDITY OF COMBUSTION GASES	IEC 60754-2
CONDUCTIVITY OF COMBUSTION GASES	IEC 60754-2
SMOKE EMISSION	IEC 61034 series
MIN. INSTALLATION TEMPERATURE	-15 °C
OPERATING TEMPERATURE	-45 – 70 °C

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Subject to change without prior notice. See latest update on our webpage.

FXMSU

Part number	Cable type
10001	FXMSU 1 x 4 SML (L)
10022	FXMSU 1 x 6 SML (L)
10003	FXMSU 2 x 4 SML (L)
10024	FXMSU 2 x 6 SML (L)
10028	FXMSU 4 x 6 SML (L)
14404	FXMSU 1 x 4 GKL (L)
14408	FXMSU 2 x 4 GKL (L)
14410	FXMSU 3 x 4 GKL (L)
14416	FXMSU 4 x 6 GKL (L)
14420	FXMSU 1 x 4 SML + 1 x 4 GKL (L)
14422	FXMSU 1 x 4 SML + 2 x 4 GKL (L)
14424	FXMSU 2 x 4 SML + 2 x 4 GKL (L)
14426	FXMSU 1 x 6 SML + 3 x 4 GKL (L)
14428	FXMSU 2 x 6 SML + 3 x 4 GKL (L)
14384	FXMSU 1 x 4 OM3L (L)
14386	FXMSU 2 x 4 OM3L (L)
14388	FXMSU 3 x 4 OM3L (L)
14398	FXMSU 4 x 6 OM3L (L)
14450	FXMSU 1 x 4 SML + 2 x 4 OM3L (L)
14451	FXMSU 2 x 4 SML + 2 x 4 OM3L (L)
14454	FXMSU 1 x 6 SML + 3 x 4 OM3L (L)
14455	FXMSU 2 x 6 SML + 3 x 4 OM3L (L)
14541	FXMSU 1 x 4 OM4L (L)
14542	FXMSU 2 x 4 OM4L (L)
14543	FXMSU 3 x 4 OM4L (L)
14564	FXMSU 4 x 6 OM4L (L)
14470	FXMSU 1 x 4 SML + 2 x 4 OM4L (L)
14472	FXMSU 2 x 4 SML + 2 x 4 OM4L (L)
14474	FXMSU 1 x 6 SML + 3 x 4 OM4L (L)
14476	FXMSU 2 x 6 SML + 3 x 4 OM4L (L)
14478	FXMSU 4 x 6 SML + 4 x 6 OM4L
10016	FXMSU 8 x 6 SML
14219	FXMSU 8 x 6 GKL
14244	FXMSU 4 x 6 SML + 4 x 6 GKL
14256	FXMSU 8 x 6 OM3L
14264	FXMSU 4 x 6 SML + 4 x 6 OM3L
14568	FXMSU 8 x 6 OM4L

Other types on request

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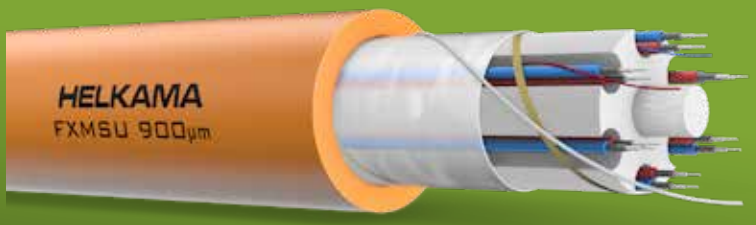
FXMSU 900 µm



		Max 12 fibers	Unit
CENTRAL ELEMENT, GLASS FIBER		2.6	Ø mm
PP-SLOTTED CORE		9.0	Ø mm
OPTICAL FIBERS		900	Ø µm
WRAPPING	Aramid binding yarn		
WATER BLOCKING	Water swellable tape		
SHEATH	LSZH Thermoplastic Standard colour orange or black		
REFERENCE STANDARD	Helkama specification		

APPLICATION

Halogen-free optical fiber cable with 900 µm tight-buffered fiber for indoor/outdoor application.

PHYSICAL PROPERTIES:

	Max 12 fibers	Unit	Mechanical test
TENSILE STRENGTH	1150	N	EN 187000 method 501
CRUSH STRENGTH/ 100 mm (PLATE)	4000	N	EN 187000 method 504
CRUSH STRENGTH/ 25 mm (MANDREL)	1000	N	EN 187000 method 504
IMPACT STRENGTH	30	J	EN 187000 method 505
LONGITUDINAL WATER TIGHTNESS			EN 18700 method 605B
MIN. BENDING RADIUS (installation/fixed)	15/10 x Ø		
NOMINAL OUTER Ø	12.4	mm	
CABLE WEIGHT	124	kg/km	

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	Eca IEC 60332-1-2 IEC 60332-3-22
UV RESISTANCE	UL1581 section 1200
HALOGEN-FREE	IEC 60754-1
ACIDITY OF COMBUSTION GASES	IEC 60754-2
CONDUCTIVITY OF COMBUSTION GASES	IEC 60754-2
SMOKE EMISSION	IEC 61034 series
MIN. INSTALLATION TEMPERATURE	-15 °C
OPERATING TEMPERATURE	-45 – 70 °C

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FXMSU 900 µm

Part number	Cable type	Colour
10044	FXMSU 900 µm 3 x 2 SMT	Orange
10046	FXMSU 900 µm 4 x 2 SMT	Black
10047	FXMSU 900 µm 5 x 2 SMT	Black
10048	FXMSU 900 µm 6 x 2 SMT	Orange
10049	FXMSU 900 µm 6 x 2 SMT	Black
14501	FXMSU 900 µm 1 x 2 GKT	Orange
14502	FXMSU 900 µm 2 x 2 GKT	Orange
14503	FXMSU 900 µm 2 x 2 OM3T	Black
14504	FXMSU 900 µm 4 x 2 GKT	Orange
14505	FXMSU 900 µm 4 x 2 OM3T	Orange
14506	FXMSU 900 µm 6 x 2 GKT	Orange
14507	FXMSU 900 µm 5 x 2 GKT	Orange
14509	FXMSU 900 µm 5 x 2 OM3T	Black
14511	FXMSU 900 µm 4 x 2 OM3T	Black
14513	FXMSU 900 µm 6 x 2 OM3T	Orange
14516	FXMSU 900 µm 2 x 2 OM3T	Orange
14520	FXMSU 900 µm 2 x 2 SMT + 2 x 2 OM3T	Black
14522	FXMSU 900 µm 2 x 2 SMT + 4 x 2 GKT	Orange

Other types on request

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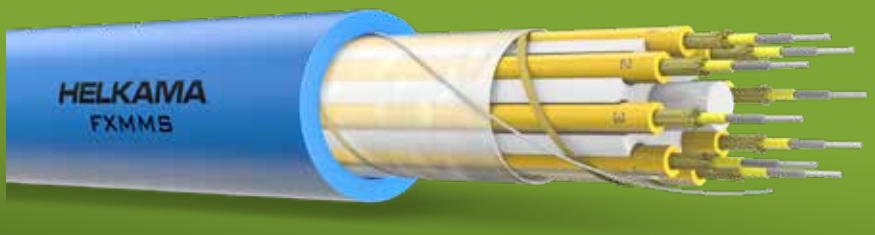
FXMMS



		Max 4 fibers	Max 8 fibers	Unit
CENTRAL ELEMENT, GLASS FIBER		2.0	2.0	Ø mm
PP-SLOTTED CORE		7.5	9.7	Ø mm
INSTALLATION CABLE UNIT	FMS 1 (2 mm) Yellow colour (SMT fibers) Green colour (GKT, OM3T and OM4T fibers)			
WRAPPING	Aramid binding yarn Fire barrier tape Rip cord under sheath			
SHEATH	LSZH Thermoplastic Standard colour blue (SMT fibers) Standard colour green (GKT, OM3T and OM4T fibers)			
REFERENCE STANDARD	Helkama specification			

APPLICATION

Halogen-free optical fiber installation cable for indoor application.

PHYSICAL PROPERTIES:

	Max 4 fibers	Max 8 fibers	Unit	Mechanical test
TENSILE STRENGTH	1500	1750	N	EN 187000 method 501
CRUSH STRENGTH/ 100 mm (PLATE)	4000	7000	N	EN 187000 method 504
CRUSH STRENGTH/ 25 mm (MANDREL)	750	1000	N	EN 187000 method 504
IMPACT STRENGTH	30	30	J	EN 187000 method 505
MIN. BENDING RADIUS (installation/fixed)	15/10 x Ø	15/10 x Ø	mm	
NOMINAL OUTER Ø	10.7	13.1	mm	
CABLE WEIGHT	102	142	kg/km	

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	Eca IEC 60332-1 IEC 60332-3-22
HALOGEN-FREE	IEC 60754-1
ACIDITY OF COMBUSTION GASES	IEC 60754-2
CONDUCTIVITY OF COMBUSTION GASES	IEC 60754-2
SMOKE EMISSION	IEC 61034 series
MIN. INSTALLATION TEMPERATURE	-15 °C
OPERATING TEMPERATURE	-45 – 70 °C

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FXMMS

Part number	Cable type
10810	FXMMS 2 SMT (2 mm)
10812	FXMMS 4 SMT (2 mm)
10814	FXMMS 6 SMT (2 mm)
10816	FXMMS 8 SMT (2 mm)
13747	FXMMS 2 GKT (2 mm)
13748	FXMMS 4 GKT (2 mm)
13749	FXMMS 6 GKT (2 mm)
13750	FXMMS 8 GKT (2 mm)
13872	FXMMS 2 OM3T (2 mm)
13874	FXMMS 4 OM3T (2 mm)
13876	FXMMS 6 OM3T (2 mm)
13878	FXMMS 8 OM3T (2 mm)
13910	FXMMS 2 OM4T (2 mm)
13912	FXMMS 4 OM4T (2 mm)
13914	FXMMS 6 OM4T (2 mm)
13916	FXMMS 8 OM4T (2 mm)

Other types on request

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FMS

OPTICAL FIBER	SMT 10/125/900 µm GKT 62.5/125/900 µm OM3T 50/125/900 µm OM4T 50/125/900 µm
INSTALLATION CABLE UNIT	1 (2 mm) / FMS 2 (2 mm) FMS 2 with separation neck
SHEATH	LSZH Thermoplastic Standard colour yellow (SMT fibers) Standard colour green (GKT, OM3T and OM4T fibers)
REFERENCE STANDARD	Helkama specification

APPLICATION

Halogen-free installation cable.

PHYSICAL PROPERTIES:

	FMS1	FMS2	Unit	Mechanical test
TENSILE STRENGTH	100	200	N	EN 187000 method 501
CRUSH STRENGTH/ 100 mm (PLATE)	1250	1250	N	EN 187000 method 504
CRUSH STRENGTH/ 25 mm (MANDREL)	100	100	N	EN 187000 method 504
IMPACT STRENGTH	15	15	J	EN 187000 method 505
MIN. BENDING RADIUS (installation/fixed)	20/12.5 x Ø			
NOMINAL OUTER Ø	1.95	1.95 x 4.0	mm	
CABLE WEIGHT	3.6	7.2	kg/km	

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	IEC 60332-1-2
HALOGEN-FREE	IEC 60754-1
ACIDITY OF COMBUSTION GASES	IEC 60754-2
CONDUCTIVITY OF COMBUSTION GASES	IEC 60754-2
SMOKE EMISSION	IEC 61034 series
MIN. INSTALLATION TEMPERATURE	-15 °C
OPERATING TEMPERATURE	-45 – 70 °C

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FMS 1 / FMS 2

Part number	Cable type
10806	FMS 1 SMT (2 mm)
13722	FMS 1 GKT (2 mm)
13726	FMS 1 OM3T (2 mm)
---	FMS 1 OM4T (2 mm)
10807	FMS 2 SMT (2 mm)
13723	FMS 2 GKT (2 mm)
13727	FMS 2 OM3T (2 mm)
---	FMS 2 OM4T (2 mm)

Other types on request

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FMMS

OPTICAL FIBER	SMT 10/125/900 µm GKT 62.5/125/900 µm OM3T 50/125/900 µm OM4T 50/125/900 µm
INSTALLATION CABLE UNIT	FMS 1 (2 mm)
SHEATH	LSZH Thermoplastic Standard colour yellow (SMT fibers), Standard colour green (GKT, OM3T and OM4T fibers)
REFERENCE STANDARD	Helkama specification

APPLICATION

Halogen-free 2 mm duplex installation cable.

PHYSICAL PROPERTIES:

		Unit	Mechanical test
TENSILE STRENGTH	200	N	EN 187000 method 501
CRUSH STRENGTH/ 100 mm (PLATE)	1500	N	EN 187000 method 504
CRUSH STRENGTH/ 25 mm (MANDREL)	150	N	EN 187000 method 504
IMPACT STRENGTH, R=300 mm	20	J	EN 187000 method 505
MIN. BENDING RADIUS (installation/fixed)	40/25	mm	
NOMINAL OUTER Ø	3.7 x 5.7	mm	
CABLE WEIGHT	21	kg/km	

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	IEC 60332-1-2
HALOGEN-FREE	IEC 60754-1
ACIDITY OF COMBUSTION GASES	IEC 60754-2
CONDUCTIVITY OF COMBUSTION GASES	IEC 60754-2
SMOKE EMISSION	IEC 61034 series
MIN. INSTALLATION TEMPERATURE	-15 °C
OPERATING TEMPERATURE	-20 – 60 °C

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FMMS

Part number	Cable type
10706	FMMS 2 SMT (2 mm)
13782	FMMS 2 GKT (2 mm)
13784	FMMS 2 OM3T (2 mm)
13785	FMMS 2 OM4T (2 mm)

Other types on request

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XCMK-HF

0.6/1 kV

CONDUCTOR	Stranded copper conductor, IEC 60228 / class 2 (class 5 on request)	
INSULATION	XLPE	
STRANDING	Parallel Cores (concentric) Extruded Filler (concentric)	Stranded Cores (braided) Dummy cores (braided)
SCREEN	Concentric conductor 2.5 mm^2	Braided 6-16 mm^2
SHEATH	LSZH Thermoplastic Standard colour black, other colours on request	
REFERENCE STANDARD	IEC 60502-1	

APPLICATION

Flame retardant, screened power supply cable for fixed installations.

PHYSICAL PROPERTIES:

MIN. BENDING RADIUS (installation/fixed)	9 x Ø/6 x Ø
CORE IDENTIFICATION	Brown and blue

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	Dca s2, d2, a1
RATED VOLTAGE	AC 0.6/1 kV (1.2 kV) DC 0.9/1.5 kV (if voltage to earth does not exceed 0.9 kV)
UV RESISTANCE	IEC 68-2-5
HALOGEN-FREE	IEC 60754 series
MAXIMUM CONDUCTOR TEMPERATURE	90 °C
MIN. INSTALLATION TEMPERATURE	-15 °C
OPERATING TEMPERATURE	-40 – 80 °C fixed installation

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XCMK-HF 1 kV CONCENTRIC CONDUCTOR

Part number	No. of conductors x Conductor area (mm²)	No. of wires x Ø of wires (mm)	Screen area (mm²)	Nominal outer Ø (mm)	Weight kg/km	Current rating A
6030409020	2 x 4	7 x 0.85	2.5	12.9	265	34
6030410020	2 x 6	7 x 1.05	2.5	14.1	331	44
6030411020	2 x 10	7 x 1.35	2.5	15.9	454	61
6030412020	2 x 16	19 x 1.04	2.5	18.4	612	82
6030413020	2 x 25	37 x 0.93	2.5	21.8	833	108
6030414020	2 x 35	37 x 1.1	2.5	24.2	1055	133

Standard length 1000 m

XCMK-HF 1 kV BRAIDED

Part number	No. of conductors x Conductor area (mm²)	No. of wires x Ø of wires (mm)	Screen area (mm²)	Nominal outer Ø (mm)	Weight kg/km	Current rating A
6030210020	2 x 6/6	7 x 1.05	6	13.7	319	44
6030211020	2 x 10/10	7 x 1.35	10	16.0	455	61
6030212020	2 x 16/16	19 x 1.04	16	18.3	660	82
6030213020	2 x 25/16	37 x 0.93	16	22.1	891	108
6030214020	2 x 35/16	37 x 1.1	16	24.5	1124	133

Standard length 1000 m

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CAT 6

S/FTP 4 PR AWG 26/7

CONDUCTOR	Stranded copper conductor 26 AWG/7
INSULATION	Foam PE
PAIR SHIELDING	Aluminium foil
SHIELDING	Tinned copper wire braid
SHEATH	LSZH
REFERENCE STANDARD	IEC 61156-6 & ISO/IEC 11801

PHYSICAL PROPERTIES:

BENDING RADIUS (Installation)	8 x Ø
MAX. RECOMMENDED PULLING TENSION	80 N
NOMINAL OUTER Ø	6.1 ± 0.3 mm
CABLE WEIGHT	37 kg/km
CORE IDENTIFICATION	
Pair colours	1. White & Blue 2. White & Orange 3. White & Green 4. White & Brown
PACKAGING	500 m drum

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	IEC 60332-1 IEC 60332-3-22
HALOGEN-FREE	IEC 60754 series
SMOKE EMISSION	IEC 61034 series
MAX. CONDUCTOR DC RESISTANCE	145 Ω/km @20 °C
CONDUCTOR LOOP RESISTANCE	max. 29 Ω/100 m @20 °C
NOM. MUTUAL CAPACITANCE	≤ 5.6 nF/100 m @1 kHz
CAPACITANCE UNBALANCE PAIR TO GROUND	≤ 1600 pF/km @1 kHz
MIN. INSULATION RESISTANCE	5000 MΩ/m
IMPEDANCE	100 ± 25 Ω @100 MHz
RATED TEMPERATURE	75 °C
OPERATING TEMPERATURE RANGE	20 °C - 75 °C

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ITEM NUMBERS:

Part number	Cable type	Colour	Standard length m
3370149072	CAT 6 S/FTP AWG 26/7	Black	500 m
3370249072	CAT 6 S/FTP AWG 26/7	Yellow	500 m
3370349072	CAT 6 S/FTP AWG 26/7	Grey	500 m
3370449072	CAT 6 S/FTP AWG 26/7	White	500 m
3370549072	CAT 6 S/FTP AWG 26/7	Orange	500 m
3370649072	CAT 6 S/FTP AWG 26/7	Blue	500 m
3370749072	CAT 6 S/FTP AWG 26/7	Red	500 m
3370849072	CAT 6 S/FTP AWG 26/7	Green	500 m

PERFORMANCE:

F (MHz)	**ATT** (dB/100 m)	**RL** (dB)	**NEXT** (dB)	**PS NEXT** (dB)	**ACRF (EL FEXT)** (dB/100 m)	**PS ACRF (PS EL FEXT)** (dB/100 m)	**PD** (ns/100 m)
1.0	2.6	34	91	84	92	89	485
4.0	4.9	33	93	85	90	87	463
8.0	7.0	35	93	88	93	90	457
10.0	7.7	38	104	97	102	99	455
16.0	9.8	34	110	103	107	104	452
20.0	11.1	34	107	101	108	105	451
25.0	12.5	39	114	107	111	108	450
31.2	14.1	39	110	104	111	108	449
62.5	20.2	40	112	106	114	111	447
100.0	25.9	43	113	107	118	115	445
200.0	36.9	35	111	103	111	108	444
250.0	41.4	28	109	103	109	106	443
300.0	45.7	29	109	103	112	109	443
400.0	53.3	38	108	101	112	109	443
500.0	60.1	31	110	97	110	107	443
600.0	66.2	27	111	102	111	108	442

F = Frequency
ATT = Attenuation
RL = Return Loss
NEXT = Near End Crosstalk
PS NEXT = Power Sum Near End Crosstalk
ACRF (EL FEXT) = Attenuation to Crosstalk Ratio Far End Crosstalk
PS ACRF (PS EL FEXT) = Power Sum Attenuation to Crosstalk Ratio Far End Crosstalk
PD = Phase Delay

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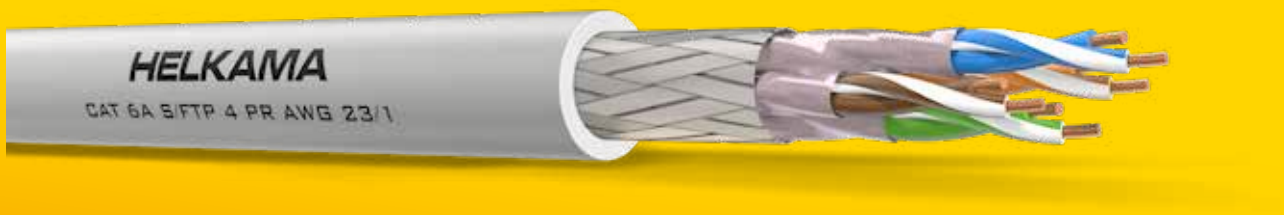
CAT 6 A

S/FTP 4 PR AWG 23/1



CONDUCTOR	Solid copper conductor 23 AWG/1
INSULATION	Foam PE
PAIR SHIELDING	Aluminium foil
SHIELDING	Tinned copper wire braid
SHEATH	LSZH
REFERENCE STANDARD	IEC 61156-5 & ISO/IEC 11801

PHYSICAL PROPERTIES:

BENDING RADIUS (Installation)	8 x Ø
MAX. RECOMMENDED PULLING TENSION	80 N
NOMINAL OUTER Ø	7.1 ± 0.3 mm
CABLE WEIGHT	51 kg/km
CORE IDENTIFICATION	
Pair colours	1. White/Blue stripe & Blue 2. White/Orange stripe & Orange 3. White/Green stripe & Green 4. White/Brown stripe & Brown
PACKAGING	500 m drum, 1000 m drum

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	Dca-s1a, d1, a1 IEC 60332-1-2 IEC 60332-3-22
MAX. CONDUCTOR DC RESISTANCE	93.8 Ω/km @20 °C
CONDUCTOR LOOP RESISTANCE	max. 19 Ω/100 m @20 °C
NOM. MUTUAL CAPACITANCE	≤ 5.6 nF/100 m @1 kHz
CAPACITANCE UNBALANCE PAIR TO GROUND	≤ 1600 pF/km @1 kHz
MIN. INSULATION RESISTANCE	5000 MΩ/m
IMPEDANCE	100 ± 25 Ω @100 MHz
RATED TEMPERATURE	75 °C
OPERATING TEMPERATURE RANGE	-20 °C - 75 °C

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ITEM NUMBERS:

Part number	Cable type	Colour	Standard length m
3388124042	CAT 6A S/FTP AWG 23/1	Black	500 m
3388224042	CAT 6A S/FTP AWG 23/1	Yellow	500 m
3388324042	CAT 6A S/FTP AWG 23/1	Grey	500 m
3388424042	CAT 6A S/FTP AWG 23/1	White	500 m
3388524042	CAT 6A S/FTP AWG 23/1	Orange	500 m
3388624042	CAT 6A S/FTP AWG 23/1	Blue	500 m
3388724042	CAT 6A S/FTP AWG 23/1	Red	500 m
3388824042	CAT 6A S/FTP AWG 23/1	Green	500 m
3389124042	CAT 6A S/FTP AWG 23/1	Black	1000 m
3389224042	CAT 6A S/FTP AWG 23/1	Yellow	1000 m
3389324042	CAT 6A S/FTP AWG 23/1	Grey	1000 m
3389424042	CAT 6A S/FTP AWG 23/1	White	1000 m
3389524042	CAT 6A S/FTP AWG 23/1	Orange	1000 m
3389624042	CAT 6A S/FTP AWG 23/1	Blue	1000 m
3389724042	CAT 6A S/FTP AWG 23/1	Red	1000 m
3389824042	CAT 6A S/FTP AWG 23/1	Green	1000 m

PERFORMANCE:

F (MHz)	**ATT** (dB/100 m)	**RL** (dB)	**NEXT** (dB)	**PS NEXT** (dB)	**ACRF (EL FEXT)** (dB/100 m)	**PS ACRF (PS EL FEXT)** (dB/100 m)	**PD** (ns/100 m)
1.0	1.8	26	85	82	85	83	448
4.0	3.4	35	88	83	86	82	433
8.0	4.8	38	86	84	88	82	428
10.0	5.4	36	100	96	95	92	427
16.0	6.9	40	101	98	96	93	425
20.0	7.8	38	101	97	97	93	425
25.0	8.7	41	100	98	95	90	424
31.2	9.8	38	103	100	89	87	423
62.5	14.0	43	101	97	92	88	421
100.0	17.8	42	106	101	85	82	420
200.0	25.2	37	97	94	74	71	419
250.0	28.4	31	99	97	72	70	419
300.0	31.2	32	101	97	71	68	419
400.0	36.0	30	99	96	63	60	419
500.0	40.6	22	96	95	60	58	419

F = Frequency
ATT = Attenuation
RL = Return Loss
NEXT = Near End Crosstalk
PS NEXT = Power Sum Near End Crosstalk
ACRF (EL FEXT) = Attenuation to Crosstalk Ratio Far End Crosstalk
PS ACRF (PS EL FEXT) = Power Sum Attenuation to Crosstalk Ratio Far End Crosstalk
PD = Phase Delay

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CAT 7

S/FTP 4 PR AWG 23/1

CONDUCTOR	Solid copper conductor 23 AWG/1
INSULATION	Foam PE
PAIR SHIELDING	Aluminium foil
SHIELDING	Tinned copper wire braid
SHEATH	LSZH
REFERENCE STANDARD	IEC 61156-5 & ISO/IEC 11801

PHYSICAL PROPERTIES:

BENDING RADIUS (INSTALLATION)	8 x Ø
MAX. RECOMMENDED PULLING TENSION	80 N
NOMINAL OUTER Ø	7.7 ± 0.3 mm
CABLE WEIGHT	66 kg/km
CORE IDENTIFICATION	
Pair colours	1. White/Blue stripe & Blue 2. White/Orange stripe & Orange 3. White/Green stripe & Green 4. White/Brown stripe & Brown
PACKAGING	500 m drum, 1000 m drum

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	Dca-s1a, d1, a1 IEC 60332-1-2 IEC 60332-3-22
MAX. CONDUCTOR DC RESISTANCE	95 Ω/km @20 °C
CONDUCTOR LOOP RESISTANCE	max. 19 Ω/100 m @20 °C
NOM. MUTUAL CAPACITANCE	≤ 5.6 nF/100 m @1 kHz
CAPACITANCE UNBALANCE PAIR TO GROUND	≤ 1600 pF/km @1 kHz
MIN. INSULATION RESISTANCE	5000 MΩ/m
IMPEDANCE	100 ± 25 Ω @100 MHz
RATED TEMPERATURE	75 °C
OPERATING TEMPERATURE RANGE	-20 °C - 75 °C

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Part number	Cable type	Colour	Standard length m
3340124042	CAT 7 S/FTP AWG 23/1	Black	500 m
3340224042	CAT 7 S/FTP AWG 23/1	Yellow	500 m
3340324042	CAT 7 S/FTP AWG 23/1	Grey	500 m
3340424042	CAT 7 S/FTP AWG 23/1	White	500 m
3340524042	CAT 7 S/FTP AWG 23/1	Orange	500 m
3340624042	CAT 7 S/FTP AWG 23/1	Blue	500 m
3340724042	CAT 7 S/FTP AWG 23/1	Red	500 m
3340824042	CAT 7 S/FTP AWG 23/1	Green	500 m
3341124042	CAT 7 S/FTP AWG 23/1	Black	1000 m
3341224042	CAT 7 S/FTP AWG 23/1	Yellow	1000 m
3341324042	CAT 7 S/FTP AWG 23/1	Grey	1000 m
3341424042	CAT 7 S/FTP AWG 23/1	White	1000 m
3341524042	CAT 7 S/FTP AWG 23/1	Orange	1000 m
3341624042	CAT 7 S/FTP AWG 23/1	Blue	1000 m
3341724042	CAT 7 S/FTP AWG 23/1	Red	1000 m
3341824042	CAT 7 S/FTP AWG 23/1	Green	1000 m

PERFORMANCE:

F (MHz)	**ATT** (dB/100 m)	**RL** (dB)	**NEXT** (dB)	**PS NEXT** (dB)	**ACRF (EL FEXT)** (dB/100 m)	**PS ACRF (PS EL FEXT)** (dB/100 m)	**PD** (ns/100 m)
4.0	3.6	30	98	95	96	92	449
8.0	5.0	32	98	95	94	89	444
10.0	5.6	35	98	95	91	90	442
16.0	7.2	35	98	95	81	76	440
20.0	8.1	38	99	96	81	77	439
25.0	9.1	39	98	95	84	76	438
31.2	10.0	39	97	94	83	77	437
62.5	14.5	34	95	92	79	76	436
100.0	17.7	32	92	89	82	73	435
200.0	26.1	30	88	85	69	66	434
250.0	27.9	28	86	83	74	65	434
300.0	31.9	27	86	83	69	64	433
400.0	37.8	28	83	80	59	56	433
500.0	40.7	23	81	78	56	51	433
600.0	45.8	25	80	77	58	52	433

F = Frequency
ATT = Attenuation
RL = Return Loss
NEXT = Near End Crosstalk
PS NEXT = Power Sum Near End Crosstalk
ACRF (EL FEXT) = Attenuation to Crosstalk Ratio Far End Crosstalk
PS ACRF (PS EL FEXT) = Power Sum Attenuation to Crosstalk Ratio Far End Crosstalk
PD = Phase Delay

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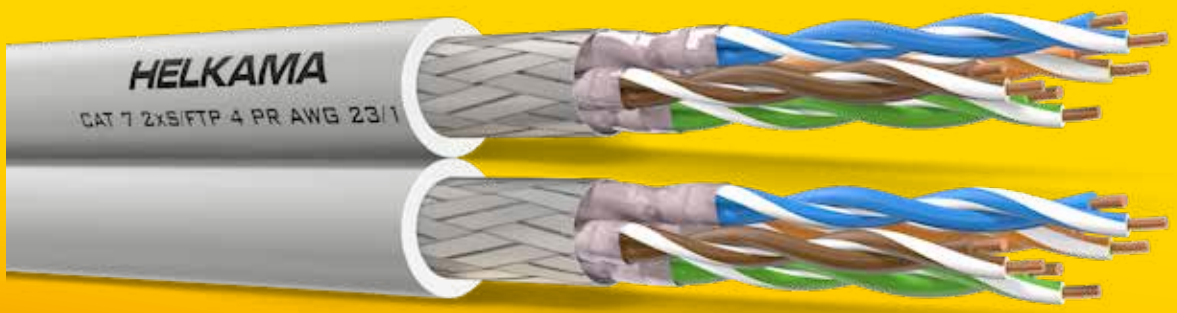
CAT 7

2XS/FTP 4 PR AWG 23/1



CONDUCTOR	Solid copper conductor 23 AWG/1
INSULATION	Foam PE
PAIR SHIELDING	Aluminium foil
SHIELDING	Tinned copper wire braid
SHEATH	LSZH
REFERENCE STANDARD	IEC 61156-5 & ISO/IEC 11801

PHYSICAL PROPERTIES:

BENDING RADIUS (Installation)	8 x Ø
MAX. RECOMMENDED PULLING TENSION	80 N
NOMINAL OUTER Ø	7.1 ± 0.3 mm X 14.3 ±1 mm
CABLE WEIGHT	132 kg/km
CORE IDENTIFICATION	
Pair colours	1. White/Blue stripe & Blue 2. White/Orange stripe & Orange 3. White/Green stripe & Green 4. White/Brown stripe & Brown
PACKAGING	500 m drum, 1000 m drum

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	Dca-s1a, d1, a1 IEC 60332-1-2 IEC 60332-3-22
MAX. CONDUCTOR DC RESISTANCE	95 Ω/km @20 °C
CONDUCTOR LOOP RESISTANCE	max. 19 Ω/100 m @20 °C
NOM. MUTUAL CAPACITANCE	≤ 5.6 nF/100 m @1 kHz
CAPACITANCE UNBALANCE PAIR TO GROUND	≤ 1600 pF/km @1 kHz
MIN. INSULATION RESISTANCE	5000 MΩ/m
IMPEDANCE	100 ± 25 Ω @100 MHz
RATED TEMPERATURE	75 °C
OPERATING TEMPERATURE RANGE	-20 °C - 75 °C

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ITEM NUMBERS:

Part number	Cable type	Colour	Standard length m
3340124082	CAT 7 2xS/FTP AWG 23/1	Black	500 m
3340224082	CAT 7 2xS/FTP AWG 23/1	Yellow	500 m
3340324082	CAT 7 2xS/FTP AWG 23/1	Grey	500 m
3340424082	CAT 7 2xS/FTP AWG 23/1	White	500 m
3340524082	CAT 7 2xS/FTP AWG 23/1	Orange	500 m
3340624082	CAT 7 2xS/FTP AWG 23/1	Blue	500 m
3340724082	CAT 7 2xS/FTP AWG 23/1	Red	500 m
3340824082	CAT 7 2xS/FTP AWG 23/1	Green	500 m

PERFORMANCE:

F (MHz)	**ATT** (dB/100 m)	**RL** (dB)	**NEXT** (dB)	**PS NEXT** (dB)	**ACRF (EL FEXT)** (dB/100 m)	**PS ACRF (PS EL FEXT)** (dB/100 m)	**PD** (ns/100 m)
4.0	3.6	30	98	95	96	92	449
8.0	5.0	32	98	95	94	89	444
10.0	5.6	35	98	95	91	90	442
16.0	7.2	35	98	95	81	76	440
20.0	8.1	38	99	96	81	77	439
25.0	9.1	39	98	95	84	76	438
31.2	10.0	39	97	94	83	77	437
62.5	14.5	34	95	92	79	76	436
100.0	17.7	32	92	89	82	73	435
200.0	26.1	30	88	85	69	66	434
250.0	27.9	28	86	83	74	65	434
300.0	31.9	27	86	83	69	64	433
400.0	37.8	28	83	80	59	56	433
500.0	40.7	23	81	78	56	51	433
600.0	45.8	25	80	77	58	52	433

F = Frequency
ATT = Attenuation
RL = Return Loss
NEXT = Near End Crosstalk
PS NEXT = Power Sum Near End Crosstalk
ACRF (EL FEXT) = Attenuation to Crosstalk Ratio Far End Crosstalk
PS ACRF (PS EL FEXT) = Power Sum Attenuation to Crosstalk Ratio Far End Crosstalk
PD = Phase Delay

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CAT 7

S/FTP 4 PR AWG 24/7

CONDUCTOR	Stranded copper conductor 24 AWG/7
INSULATION	Foam PE
PAIR SHIELDING	Aluminium foil
SHIELDING	Tinned copper wire braid
SHEATH	LSZH
REFERENCE STANDARD	IEC 61156-5 & ISO/IEC 11801

PHYSICAL PROPERTIES:

BENDING RADIUS (Installation)	8 x Ø
MAX. RECOMMENDED PULLING TENSION	80 N
NOMINAL OUTER Ø	7.6 ± 0.3 mm
CABLE WEIGHT	61 kg/km
CORE IDENTIFICATION	
Pair colours	1. White/Blue stripe & Blue 2. White/Orange stripe & Orange 3. White/Green stripe & Green 4. White/Brown stripe & Brown
PACKAGING	500 m drum, 1000 m drum

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	IEC 60332-1 IEC 60332-3-22
HALOGEN-FREE	IEC 60754 series
SMOKE EMISSION	IEC 61034 series
MAX. CONDUCTOR DC RESISTANCE	148 Ω/km @20 °C
CONDUCTOR LOOP RESISTANCE	max. 29 Ω/100 m @20 °C
NOM. MUTUAL CAPACITANCE	≤ 5.6 nF/100 m @1 kHz
CAPACITANCE UNBALANCE PAIR TO GROUND	≤ 1600 pF/km @1 kHz
MIN. INSULATION RESISTANCE	5000 MΩ/m
IMPEDANCE	100 ± 25 Ω @100 MHz
RATED TEMPERATURE	80 °C
OPERATING TEMPERATURE RANGE	-20 °C - 75 °C

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ITEM NUMBERS:

Part number	Cable type	Colour	Standard length m
3360124042	CAT 7 S/FTP AWG 24/7	Black	500 m
3360224042	CAT 7 S/FTP AWG 24/7	Yellow	500 m
3360324042	CAT 7 S/FTP AWG 24/7	Grey	500 m
3360424042	CAT 7 S/FTP AWG 24/7	White	500 m
3360524042	CAT 7 S/FTP AWG 24/7	Orange	500 m
3360624042	CAT 7 S/FTP AWG 24/7	Blue	500 m
3360724042	CAT 7 S/FTP AWG 24/7	Red	500 m
3360824042	CAT 7 S/FTP AWG 24/7	Green	500 m
3361124042	CAT 7 S/FTP AWG 24/7	Black	1000 m
3361224042	CAT 7 S/FTP AWG 24/7	Yellow	1000 m
3361324042	CAT 7 S/FTP AWG 24/7	Grey	1000 m
3361424042	CAT 7 S/FTP AWG 24/7	White	1000 m
3361524042	CAT 7 S/FTP AWG 24/7	Orange	1000 m
3361624042	CAT 7 S/FTP AWG 24/7	Blue	1000 m
3361724042	CAT 7 S/FTP AWG 24/7	Red	1000 m
3361824042	CAT 7 S/FTP AWG 24/7	Green	1000 m

PERFORMANCE:

F (MHz)	**ATT** (dB/100 m)	**RL** (dB)	**NEXT** (dB)	**PS NEXT** (dB)	**ACRF (EL FEXT)** (dB/100 m)	**PS ACRF (PS EL FEXT)** (dB/100 m)	**PD** (ns/100 m)
1.0	2.6	34	91	84	92	89	485
4.0	4.9	33	93	85	90	87	463
8.0	7.0	35	93	88	93	90	457
10.0	7.7	38	104	97	102	99	455
16.0	9.8	34	110	103	107	104	452
20.0	11.1	34	107	101	108	105	451
25.0	12.5	39	114	107	111	108	450
31.2	14.1	39	110	104	111	108	449
62.5	20.2	40	112	106	114	111	447
100.0	25.9	43	113	107	118	115	445
200.0	36.9	35	111	103	111	108	444
250.0	41.4	28	109	103	109	106	443
300.0	45.7	29	109	103	112	109	443
400.0	53.3	38	108	101	112	109	443
500.0	60.1	31	110	97	110	107	443
600.0	66.2	27	111	102	111	108	442

F = Frequency
ATT = Attenuation
RL = Return Loss
NEXT = Near End Crosstalk
PS NEXT = Power Sum Near End Crosstalk
ACRF (EL FEXT) = Attenuation to Crosstalk Ratio Far End Crosstalk
PS ACRF (PS EL FEXT) = Power Sum Attenuation to Crosstalk Ratio Far End Crosstalk
PD = Phase Delay

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CAT 7

S/FTP 4 PR AWG 26/7

CONDUCTOR	Stranded tinned copper conductor 26 AWG/7
INSULATION	Foam PE
PAIR SHIELDING	Aluminium foil
SHIELDING	Tinned copper wire braid
SHEATH	LSZH
REFERENCE STANDARD	IEC 61156-5 ISO/IEC 11801

PHYSICAL PROPERTIES:

BENDING RADIUS (Installation)	8 x Ø
MAX. RECOMMENDED PULLING TENSION	80 N
NOMINAL OUTER Ø	6.4 ± 0.3 mm
CABLE WEIGHT	39 kg/km
CORE IDENTIFICATION	
Pair colours	1. White/Blue stripe & Blue 2. White/Orange stripe & Orange 3. White/Green stripe & Green 4. White/Brown stripe & Brown
PACKAGING	500 m drum, 1000 m drum

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	IEC 60332-1 IEC 60332-3-22
HALOGEN-FREE	IEC 60754 series
SMOKE EMISSION	IEC 61034 series
MAX. CONDUCTOR DC RESISTANCE	145 Ω/km @20 °C
CONDUCTOR LOOP RESISTANCE	max. 29 Ω/100 m @20 °C
NOM. MUTUAL CAPACITANCE	≤ 5.6 nF/100 m @1 kHz
CAPACITANCE UNBALANCE PAIR TO GROUND	≤ 1600 pF/km @1 kHz
MIN. INSULATION RESISTANCE	5000 MΩ/m
IMPEDANCE	100 ± 25 Ω @100 MHz
RATED TEMPERATURE	75 °C
OPERATING TEMPERATURE RANGE	-20 °C - 75 °C

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ITEM NUMBERS:

Part number	Cable type	Colour	Standard length m
3360149042	CAT 7 S/FTP AWG 26/7	Black	500 m
3360149042	CAT 7 S/FTP AWG 26/7	Yellow	500 m
3360149042	CAT 7 S/FTP AWG 26/7	Grey	500 m
3360149042	CAT 7 S/FTP AWG 26/7	White	500 m
3360149042	CAT 7 S/FTP AWG 26/7	Orange	500 m
3360149042	CAT 7 S/FTP AWG 26/7	Blue	500 m
3360149042	CAT 7 S/FTP AWG 26/7	Red	500 m
3360149042	CAT 7 S/FTP AWG 26/7	Green	500 m
3360149042	CAT 7 S/FTP AWG 26/7	Black	1000 m
3360149042	CAT 7 S/FTP AWG 26/7	Yellow	1000 m
3360149042	CAT 7 S/FTP AWG 26/7	Grey	1000 m
3360149042	CAT 7 S/FTP AWG 26/7	White	1000 m
3360149042	CAT 7 S/FTP AWG 26/7	Orange	1000 m
3360149042	CAT 7 S/FTP AWG 26/7	Blue	1000 m
3360149042	CAT 7 S/FTP AWG 26/7	Red	1000 m
3360149042	CAT 7 S/FTP AWG 26/7	Green	1000 m

PERFORMANCE:

F (MHz)	**ATT** (dB/100 m)	**RL** (dB)	**NEXT** (dB)	**PS NEXT** (dB)	**ACRF (EL FEXT)** (dB/100 m)	**PS ACRF (PS EL FEXT)** (dB/100 m)	**PD** (ns/100 m)
4.0	4.9	32	107	95	117	-	463
8.0	6.8	32	107	98	107	-	457
10.0	7.6	35	105	96	100	-	456
16.0	9.6	34	104	95	116	-	453
20.0	10.8	43	117	98	106	-	452
25.0	12.2	40	115	100	103	-	451
31.2	13.7	39	107	100	108	-	450
62.5	19.7	42	114	102	113	-	447
100.0	25.1	39	102	100	109	-	446
200.0	35.9	37	111	104	102	-	445
250.0	40.1	33	104	99	112	-	444
300.0	44.3	33	114	101	109	-	444
600.0	63.9	27	102	93	106	-	443

If FEXT loss is greater than 70 dB, PS ACR-F loss may not be measured

F = Frequency
ATT = Attenuation
RL = Return Loss
NEXT = Near End Crosstalk
PS NEXT = Power Sum Near End Crosstalk
ACRF (EL FEXT) = Attenuation to Crosstalk Ratio Far End Crosstalk
PS ACRF (PS EL FEXT) = Power Sum Attenuation to Crosstalk Ratio Far End Crosstalk
PD = Phase Delay

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CAT 7 PUR

S/FTP 4 PR AWG 26/7

CONDUCTOR	Stranded tinned copper conductor 26 AWG/7
INSULATION	Foam PE
PAIR SHIELDING	Aluminium foil
SHIELDING	Tinned copper wire braid
SHEATH	Polyurethane compound
REFERENCE STANDARD	IEC 61156-6

APPLICATION

Good mechanical characteristics, high tensile strength, resistant to UV, abrasion, chemicals, oil and other fluids

PHYSICAL PROPERTIES:

BENDING RADIUS (Installation)	8 x Ø
MAX. RECOMMENDED PULLING TENSION	80 N
NOMINAL OUTER Ø	6.4 ± 0.3 mm
CABLE WEIGHT	39 kg/km
CORE IDENTIFICATION	
Pair colours	1. White/Blue stripe & Blue 2. White/Orange stripe & Orange 3. White/Green stripe & Green 4. White/Brown stripe & Brown
PACKAGING	500 m drum, 1000 m drum

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	IEC 60332-1
HALOGEN-FREE	IEC 60754 series
SMOKE EMISSION	IEC 61034 series
MAX. CONDUCTOR DC RESISTANCE	145 Ω/km @20 °C
CONDUCTOR LOOP RESISTANCE	max. 29 Ω/100 m @20 °C
NOM. MUTUAL CAPACITANCE	≤ 5.6 nF/100 m @1 kHz
CAPACITANCE UNBALANCE PAIR TO GROUND	≤ 1600 pF/km @1 kHz
MIN. INSULATION RESISTANCE	5000 MΩ/m
IMPEDANCE	100 ± 25 Ω @100 MHz
RATED TEMPERATURE	75 °C
OPERATING TEMPERATURE RANGE	-20 °C - 75 °C

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ITEM NUMBERS:

Part number	Cable type	Colour	Standard length m
3350149042	CAT 7 S/FTP AWG 26/7 PUR	Black	500 m
3350149042	CAT 7 S/FTP AWG 26/7 PUR	Yellow	500 m
3350149042	CAT 7 S/FTP AWG 26/7 PUR	Grey	500 m
3350149042	CAT 7 S/FTP AWG 26/7 PUR	White	500 m
3350149042	CAT 7 S/FTP AWG 26/7 PUR	Orange	500 m
3350149042	CAT 7 S/FTP AWG 26/7 PUR	Blue	500 m
3350149042	CAT 7 S/FTP AWG 26/7 PUR	Red	500 m
3350149042	CAT 7 S/FTP AWG 26/7 PUR	Green	500 m
3350149042	CAT 7 S/FTP AWG 26/7 PUR	Black	1000 m
3350149042	CAT 7 S/FTP AWG 26/7 PUR	Yellow	1000 m
3350149042	CAT 7 S/FTP AWG 26/7 PUR	Grey	1000 m
3350149042	CAT 7 S/FTP AWG 26/7 PUR	White	1000 m
3350149042	CAT 7 S/FTP AWG 26/7 PUR	Orange	1000 m
3350149042	CAT 7 S/FTP AWG 26/7 PUR	Blue	1000 m
3350149042	CAT 7 S/FTP AWG 26/7 PUR	Red	1000 m
3350149042	CAT 7 S/FTP AWG 26/7 PUR	Green	1000 m

PERFORMANCE:

F (MHz)	**ATT** (dB/100 m)	**RL** (dB)	**NEXT** (dB)	**PS NEXT** (dB)	**ACRF (EL FEXT)** (dB/100 m)	**PS ACRF (PS EL FEXT)** (dB/100 m)	**PD** (ns/100 m)
4.0	4.9	32	107	95	117	-	463
8.0	6.8	32	107	98	107	-	457
10.0	7.6	35	105	96	100	-	456
16.0	9.6	34	104	95	116	-	453
20.0	10.8	43	117	98	106	-	452
25.0	12.2	40	115	100	103	-	451
31.2	13.7	39	107	100	108	-	450
62.5	19.7	42	1114	102	113	-	447
100.0	25.1	39	102	100	109	-	446
200.0	35.9	37	111	104	102	-	445
250.0	40.1	33	104	99	112	-	444
300.0	4.3	33	114	101	109	-	444
600.0	63.9	27	102	93	106	-	443

If FEXT loss is greater than 70 dB, PS ACR-F loss may not be measured

F = Frequency
ATT = Attenuation
RL = Return Loss
NEXT = Near End Crosstalk
PS NEXT = Power Sum Near End Crosstalk
ACRF (EL FEXT) = Attenuation to Crosstalk Ratio Far End Crosstalk
PS ACRF (PS EL FEXT) = Power Sum Attenuation to Crosstalk Ratio Far End Crosstalk
PD = Phase Delay

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CAN-BUS

1 X 2 X 0.75 120 Ω

CONDUCTOR	Flexible tinned copper conductor 0.75 mm²
INSULATION	PE
STRANDING	Two cores form a pair
SCREEN	Tinned copper wire braid Coverage 80%
OUTER SHEATH	LSZH
COLOUR	Violet

PHYSICAL PROPERTIES:

BENDING RADIUS	5 x Ø
NOMINAL OUTER Ø	8.7 ± 0.3 mm
CORE IDENTIFICATION **Pair colours**	1. White 2. Brown
PART NUMBER	29994

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	IEC 60332-1-2 IEC 60332-3-22
OPERATING VOLTAGE	30 V
TEST VOLTAGE	1000 V
HALOGEN FREE	IEC 60754 series
SMOKE EMISSION	IEC 61034 series
CHARACTERISTIC IMPEDANCE	120 ± 12 Ω @1 MHz
OPERATING TEMPERATURE RANGE	-25 °C - 80 °C

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CAN-BUS

2 X 2 X 0.75 120 Ω

CONDUCTOR	Flexible tinned copper conductor 0.75 mm²
INSULATION	PE
STRANDING	Two cores form a pair (two pairs) with fillers to obtain symmetrical and round construction
SCREEN	Tinned copper wire braid Coverage 80%
OUTER SHEATH	LSZH
COLOUR	Violet

PHYSICAL PROPERTIES:

BENDING RADIUS	5 x Ø
NOMINAL OUTER Ø	11.5 ± 0.3 mm
CORE IDENTIFICATION **Pair colours**	1. White 2. Brown 3. Yellow 4. Green
PART NUMBER	29995

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	IEC 60332-1-2 IEC 60332-3-22
OPERATING VOLTAGE	30 V
TEST VOLTAGE	1000 V
HALOGEN FREE	IEC 60754 series
SMOKE EMISSION	IEC 61034 series
CHARACTERISTIC IMPEDANCE	120 ± 12 Ω @1 MHz
OPERATING VOLTAGE	30 V

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PROFIBUS DP

1 X 2 X AWG 22/7 -HF

CONDUCTOR	Stranded tinned copper conductor AWG 22/7
INSULATION	Foam-Skin-PE
STRANDING	Two cores stranded together with 2 fillers
SCREEN 1	Aluminium polyester tape
SCREEN 2	Tinned copper wire braid
OUTER SHEATH	LSZH
COLOUR	Violet

PHYSICAL PROPERTIES:

BENDING RADIUS	5 x Ø
NOMINAL OUTER Ø	7.8 ± 0.2 mm
CABLE WEIGHT	69 kg/km
CORE IDENTIFICATION	1. Red 2. Green
PART NUMBER	29996

MAIN CHARACTERISTICS:

MAXIMUM RESISTANCE CONDUCTOR (LOOP)	≤ 110 Ω/km	
CHARACTERISTIC IMPEDANCE	150 Ω ± 10%	
MUTUAL CAPACITANCE	30 nF/km	
ATTENUATION	9.6 kHz 38.4 kHz 4.0 MHz 16.0 MHz	≤ 2.5 dB/km ≤ 4.0 dB/km ≤ 22.0 dB/km ≤ 42.0 dB/km

MAIN CHARACTERISTICS:

FIRE PERFORMANCE	IEC 60332-1-2 IEC 60332-3-22	
HALOGEN FREE	IEC 60754 series	
SMOKE EMISSION	IEC 61034 series	
MAXIMUM RESISTANCE CONDUCTOR (LOOP)	≤ 110 Ω/km	
CHARACTERISTIC IMPEDANCE	150 Ω ± 10%	
MUTUAL CAPACITANCE	30 nF/km	
ATTENUATION	9.6 kHz 38.4 kHz 4.0 MHz 16.0 MHz	≤ 2.5 dB/km ≤ 4.0 dB/km ≤ 22.0 dB/km ≤ 42.0 dB/km
OPERATING TEMPERATURE RANGE	-25 °C - 70 °C	

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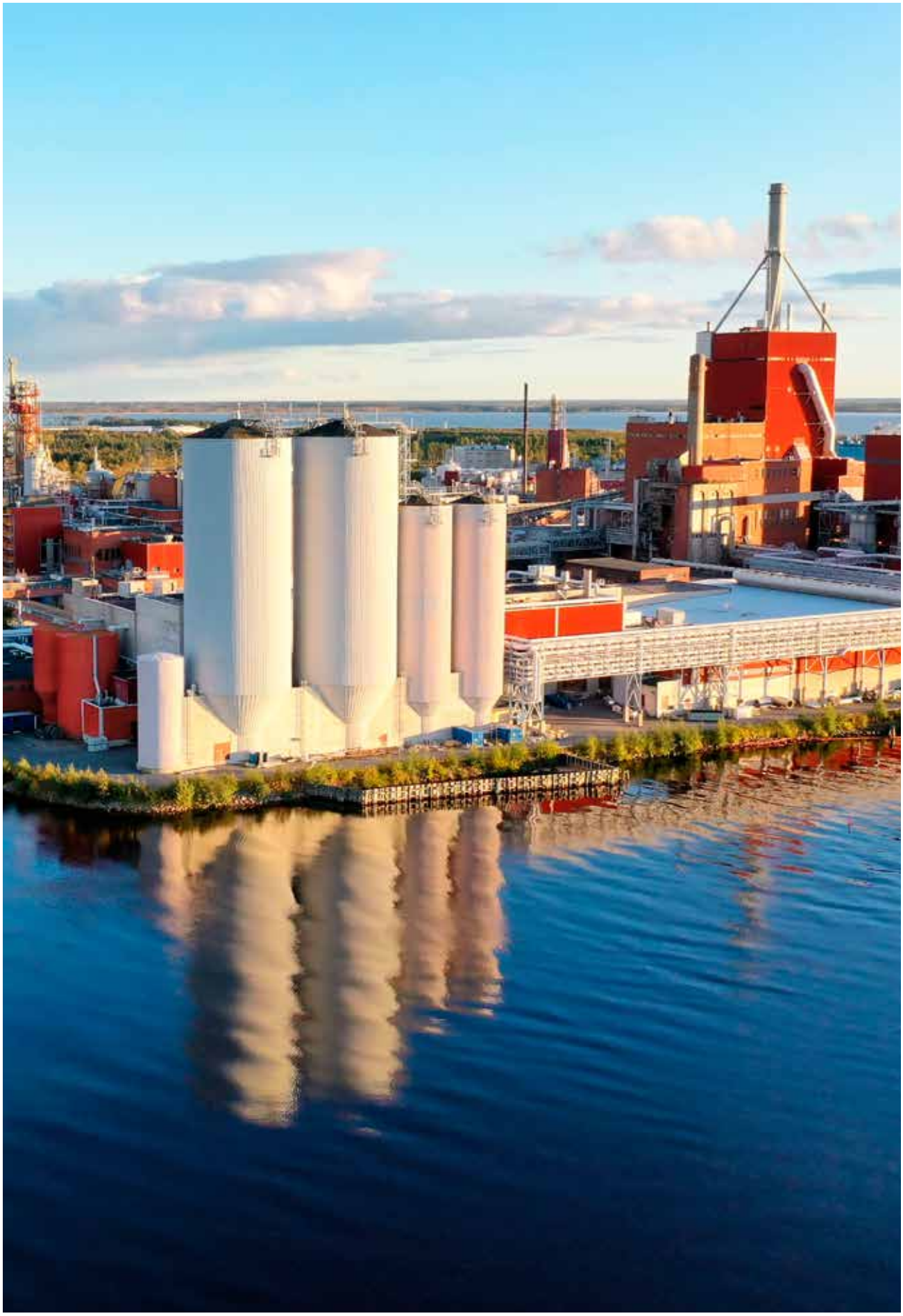

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CHARACTERISTICS OF OPTICAL FIBER CABLES

SINGLE-MODE FIBER

Conditions		SM/OS2	Unit
Standards according to ITU-T		**G.652.D**	
Attenuation (max)	1310 nm	≤ 0.40	dB/km
	1550 nm	≤ 0.30	dB/km
Cut-off wavelength		≤ 1260	nm
Cut-off wavelength installation		1180 — 1250	nm
Zero dispersion wavelength		1300 — 1324	nm
Zero dispersion slope		≤ 0.092	ps/nm²/km
Polarization mode dispersion		≤ 0.5	ps/√km
Mode field diameter (MFD)	1310 nm	9.1 ± 0.4	µm
	1550 nm	10.3 ± 0.4	µm
Mode field eccentricity		≤ 1.0	µm
Mode field eccentricity, installation		≤ 0.5	µm
Cladding diameter		125 ± 2	µm
Cladding diameter, installation		125 ± 1	µm
Cladding ellipticity		≤ 1	%

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MULTI MODE FIBER

Conditions					Unit
Fiber class		**GK/OM1**	**OM3**	**OM4**	
		GKL 250 ± 10	OM3L 250 ± 10	OM4L 250 ± 10	µm
		GKT 900 ± 50	OM3T 900 ± 50	OM4T 900 ± 50	µm
Attenuation (max)	850 nm	3.0	2.7	2.5	dB/km
	1300 nm	≤ 1.0	≤ 0.8	≤ 0.8	dB/km
Bandwidth	850 nm (LED)	≥ 200	≥ 1500	≥ 3500	MHz x km
	1300 nm (LED)	≥ 500	≥ 500	≥ 500	MHz x km
	850 nm (Laser)		≥ 2000	≥ 4700	MHz x km
Numerical aperture (NA)		0.275 ± 0.015	0.200 ± 0.015	0.200 ± 0.015	
Core diameter		62.5 ± 3	50 ± 2	50 ± 2.5	µm
Core ellipticity		≤ 6	≤ 6	≤ 6	%
Core eccentricity		≤ 3	≤ 3	≤ 2	µm
Cladding diameter		125 ± 2	125 ± 1	125 ± 1	µm
Cladding ellipticity		≤ 2	≤ 2	≤ 2	%

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GENERAL INFORMATION

MATERIALS

INSULATION MATERIALS

XLPE
Cross-linked polyethylene compound.
Excellent mechanical and electrical characteristics

PE
Polyethylene thermoplastic compound

SHEATHING MATERIALS

LSZH THERMOPLASTIC
Low smoke zero halogen thermoplastic compound. Flame retardant and self-extinguishing in the event of fire.

SHF1
LSZH thermoplastic. Low smoke zero halogen thermoplastic compound. Flame retardant and self-extinguishing in the event of fire.

SHF2
Crosslinked thermoset plastic. Low smoke zero halogen cross-linked thermoset oil-resistant compound. Flame retardant and self-extinguishing in the event of fire.

MARKING ON THE SHEATH

Lot number, Cable type, Cable size (number of cores x size of conductors mm²), Voltage, Temperature, Standards, Manufacturer's name, Production month and year, Meter marking.

TESTS AND DEFINITIONS OF TERMS

CPR CABLE CLASSIFICATION

B2ca, Cca, Dca, Eca
Analyses the reaction of electrical cables to fire. Four classes apply directly to electrical cables, classified according to their flame spread and heat release.

ADDITIONAL CLASSIFICATION LEVELS: s, d, a
Three additional CPR classification levels refer to:

s = smoke	The opacity and amount of smoke produced
d = droplets	The flaming droplets released by the cable during combustion
a = acidity	The acidity of the smoke

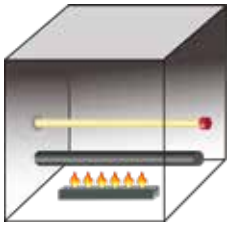
HALOGEN-FREE

Halogen-free refers to the absence of halogens, such as chlorine and fluorine. Determined on the basis of the halogen content and the acidity of cable´s gases.
Halogen-free IEC 60754-series consists of standards IEC 60754-1 and IEC 60754-2.

IEC 60754-1
Determines halogen content of material. Halogen content of material may not exceed 0.5% or 5 mg/g.

IEC 60754-2
Determines degree of acidity of combustion gases. Limit values > 4.3 for pH and < 10 µS/mm for conductivity.

SMOKE EMISSION
IEC 61034-1, IEC 61034-2
Smoke emission refers to visibility in a fire. Greater light transmittance means better visibility.
Smoke Emission IEC 61034-series consists of standards IEC 61034-1 and IEC 61034-2.



27 m³ cube smoke chamber

Requirements: 60% light transmittance

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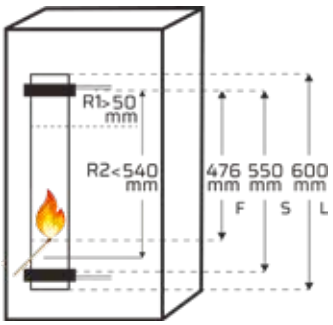
FIRE PERFORMANCE

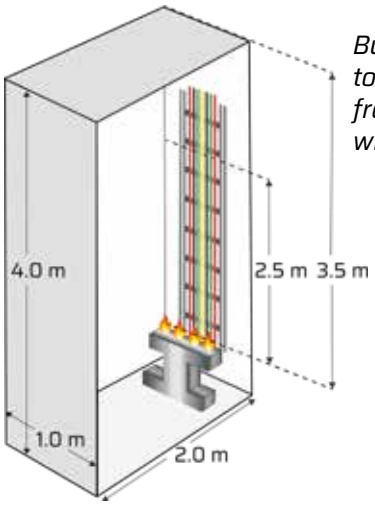
IEC 60332-1, IEC 60332-3
Cables must withstand the test specified in IEC standard 60332-3 or IEC 60332-1. Flame-retardant cables do not propagate fire and are self-extinguishing.

IEC 60332-1
Test for single cable. Test procedure and requirements according to picture below.



Min. 50 mm of the cable, measured from the upper support, must remain unburned after the specified time.

IEC 60332-3
Test for bunched cables with three categories - A, B and C. Categories are defined by different limits for flammable material and burning times. Cables must extinguish themselves once the burner has been removed.
Test procedure and requirements according to picture and table below.



Burning allowed up to max. 2.5 meters from the burner within a specified time.

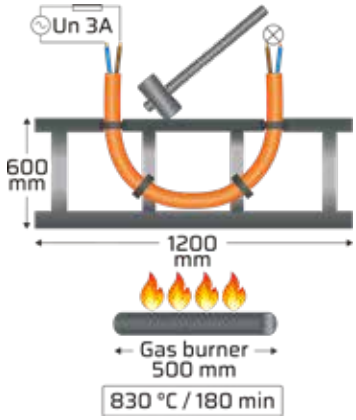
FIRE-RESISTANT

Helkama fire-resistant cables are also flame-retardant.

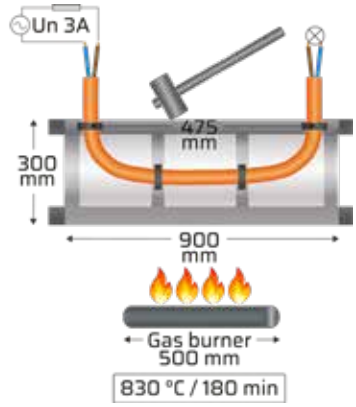
IEC 60331-21
Cables must operate for min. 90 minutes while subjected to fire from burner.

IEC 60331-25
Cables must operate for min. 180 minutes while subjected to fire from burner.

IEC 60331-1
Test method for fire with shock at a temperature of min. 830 °C for 180 minutes for cables with rated voltage up to and including 0.6/1.0 kV, and with Ø > 20 mm.



IEC 60331-2
Test method for fire with shock at a temperature of min. 830 °C for 180 minutes for cables with rated voltage up to and including 0.6/1.0 kV, and with Ø < 20 mm.



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