



MOSKABEL-FUJIKURA

Communication optical cable

Composite communication cable

Accessories for suspension of optical cable

Fusion splicers for optical fibers

Cleavers for optical fibers

Optical distributing frames

Measuring instruments

Optical closures

Optical patch cords



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AIMS OF MOSKABEL-FUJIKURA

To supply customers with competitive products of steady high quality for successful business.

MISSION OF MOSKABEL-FUJIKURA

To make worthy contribution into the development of telecommunication infrastructure and the creation of information society in Russia.

Basic principles of our Company:

ORIENTATION TO REQUIREMENTS OF OUR CUSTOMES

We pay utmost attention to requirements of our customers. High-quality Russian product meets the highest international standards with reasonable prices. It gives our customers the chance to decrease costs without affecting quality.

CONFIDENCE OF CLIENTS

We adhere to the principles of honesty and openness in dealing with our customers and partners. One of main tasks of our Company is to build-up trust and reliable relations with our clients.

CONTINUING IMPROVEMENTS

We strive for innovations and improvements of technology and logistics.
We promote professional growth of our staff.



MOSKABEL-FUJIKURA

On the factory

Stock company MOSKABEL-FUJIKURA (AO MKF) was founded by ZAO MOSKABELMET jointly with FUJIKUA Ltd. on 9 September 1999. AO MKF specializes in production of optical cables for backbone optical networks, backhaul networks and LANs.

Over 17 years MKF is one of leaders in production of optical cables in Russia.

The factory of MOSKABEL-FUJIKURA has modern production equipment from such leading foreign manufacturers as:

- NEXTROM (Finland)
- SWISSCAB (Switzerland)
- MAILLEFER (Finland)
- MALI (Austria)
- ROSENDAHL (Austria)
- DUNST (Austria)
- MEDEK&SCHORNER (Austria)
- SKET (Germany)

Materials used for production:

- FUJIKURA Ltd. (Japan)
- BOREALIS (Finland)
- DUPONT (the USA)
- HERKULA (Germany)

and of many other well-known foreign manufacturers.

Manufacturing capacities of MKF give it a chance to manufacture up to 35 000 km of cable annually.

MKF technologies allow manufacturing optical cables containing up to 1152 optical fibers.

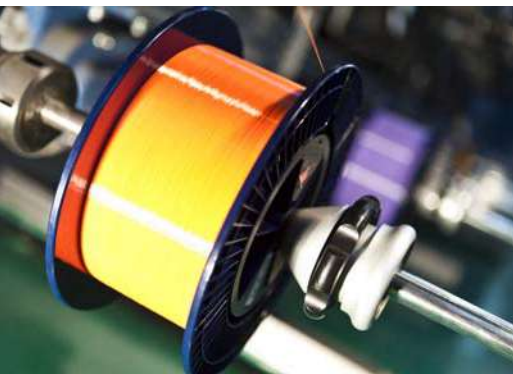
MKF develops new designs and manufactures optical cables with due regard to additional requirements of the customers.

Optical cable made by MKF is included into the list of electronic component base and is admitted to deliveries for the Ministry of Defence of the Russian Federation.

Technical control at all stages of production and professionalism of the staff ensure consistently high quality of products. High quality of MKF products is proved by cable operation in different climatic regions of Russia and abroad.

Consumers of MKF products are PAO ROSTELECOM, PAO MTS, PAO TRANSNEFT, national operator of Belorussia BELTELECOM, the Ministry of Defence of the Russian Federation, and many others.

We invite interested companies to cooperate with us.



The company has developed, implemented and successfully operates a quality management system covering the entire process from cables designing and purchasing materials to acceptance testing and delivery of products to the customer.

The Quality Management System of the enterprise was certified:

- in the system of voluntary certification "AFNOR and IQNet ", Certificate of Conformity of the QMS to requirements of ISO 9001-2015
- in the system of voluntary certification "REGISTER OF MANAGEMENT SYSTEMS", Certificate of Conformity of the QMS to requirements of GOST R ISO 9001-2015

Ecological Management System that complies with requirements of GOST R ISO 14001-2007 (ISO 14001:2004) has been implemented and successfully functions at the enterprise with the aim of protecting the environment and health.

To improve quality, to develop new advanced technologies, to gain and maintain the trust of customers – those are the priority areas of activities of our company.

In accordance with modern requirements to fire safety optical cables can be manufactured in sheath made of polymer materials that are fire retardant in case of single and bundle laying, with lower smoke and gas liberation, without liberation of corrosive gaseous products when burning or smoldering. Fire safety of the cables manufactured by MKF has been proved with certificates in categories: -n, -ng(A), -ng(A)-HF, -ng(A)-LS, -ng(A)-FR, -ng(A)-LTx, -ng(A)-FRHF, -ng(A)-FRLS, -ng(A)-HFLTx, -ng(A)-LSLTx, -ng(A)-FRHFLTx, -ng(A)-FRLSLTx.

TEST LABORATORY AND PRODUCT CONTROL

Our enterprise has arranged operation and acceptance control to guaranty manufacture of high-quality products.

A test lab was set up at the factory to control the quality of manufactured cable. During the quality control of incoming materials the following equipment is used:

- Heat chamber HERAEUS makes possible to control the quality of polymers and semi-products used in production of fiber optical cables through thermal testing up to + 300°C;
- The breaking machine INSPEKT is designed to control the quality of strength members of cables, such as aramid filament, steel wire, glass-reinforced plastic (GRP) rods, steel strand;
- The moisture meter **AND MS-70** makes it possible to control moisture content in materials during production process;
- The instrument **SWO HAAKE** for measuring melt fluidity indicator is used to prove the quality of polymers used in production.

The following equipment is used to control the quality of finished products:

- Climatic chamber **CLIMATS 8M** makes possible testing fiber optical cables in the temperature range from -60°C to 70°C with humidity of up to 98%;
- The test setup **FA-10** of company **SWISSCAB** allows testing the cable for resistance to tensile stress up to 100 kN and crushing force to 1,5 kN /cm;
- Samples of the cable are tested for resistance to mechanical stress - twisting, bending, impact;
- Analyzer **IQ-5500 PMD** is used to measure polarization mode dispersion of optical fibers;
- The lab is also equipped with **ID-2-3B** – device for measuring fiber elongation during tests for resistance of optical cables to tension;
- Our lab is equipped with a unique instrument – optical fiber strain analyzer **BOTDR AQ8603** designed for finding and analysis of mechanical strain fibers in optical cable during manufacturing process, during installation and service of an entire communication line. Measuring results make it possible to forecast fiber life cycle, that is the entire communication line.



OPTICAL FIBER

AO MKF uses for cable production optical fiber manufactured by FUJIKURA Ltd. (Japan) or, if requested by the customer, optical fiber made by other manufacturers.

Optical fibers comply with Recommendations of ITU-T: G.651, G.652, G.653, G.654, G.655, G.657, and other international standards.

PARAMETERS AND TYPES OF SINGLE-MODE OPTICAL FIBERS

Geometric and transmitting parameters of optical fiber		ITU-T G.652.D+ G.657.A1 (E3)	ITU-T G.652.D (E3)	ITU-T G.653 (E4)	ITU-T G.654 (E2)	ITU-T G.655 (E5)	ITU-T G.657.A1	ITU-T G.657.A2
Operating wavelength, nm		1310, 1383, 1550, 1625	1310, 1383, 1550	1550	1550	1550, 1625	1310, 1383, 1550, 1625	1310, 1383, 1550, 1625
Attenuation coefficient at reference wavelength, dB/km, not more than	1310 nm	0.32	0.35	-	0.35	-	0.35	0.35
	1383 nm	0.31	0.31	-	0.35	-	0.35	0.35
	1550 nm	0.18	0.18	0.35	0.22	0.20	0.21	0.22
	1625 nm	0.2	-	-	0.24	0.22	0.23	0.24
Diameter of mode field, μm	1310 nm	9.2±0.4	9.2±0.4	7.8±0.8	8.6±0.4	-	8.6±0.4	8.6±0.4
	1550 nm	10.4±0.5	10.4±0.8	8.5±0.8	10.5±0.7	9.6±0.4	-	-
Cladding diameter, μm		125.0±0.7	125.0±1.0	-	-	125.0±1.0	-	-
Non-concentricity of fiber core and cladding, μm		0.5	0.5	0.8	0.6	0.6	0.5	0.5
Coating diameter, μm		240±5	240±5			245±10	240±5	
Cutoff wavelength, nm		1260	1260	1270	1530	1480	1260	1260
Wavelength of zero dispersion, nm		1302-1324	1300-1324					
Zero dispersion slope, ps/(nm ² × km)		0.092	0.092	0.085	-	-	0.092	0.092
Coefficient of chromatic dispersion, ps/(nm ² × km)	1310 nm	<3.5	<3.5				<3.5	
	1550 nm	<18	<18			2.0-6.0	<18	
Coefficient of polarization mode dispersion, ps/km		0.04	0.08	0.2	0.02	0.10	0.2	0.2

PARAMETERS AND TYPES OF MULTIMODE OPTICAL FIBERS

Geometrical and transmission parameters of optical fibers		IEC60793-2-10 (OM1/M2)	ITU-T G.651.1 (OM2/M1)	ITU-T G.651.1 (OM3/M3)	ITU-T G.651.1 (OM4/M4)
Operating wavelength, nm		850/1300	850/1300	850/1300	850/1300
Coefficient of attenuation at reference wavelength, dB/km, not more than	850 nm	2.9	2.9	2.3	2.3
	1300 nm	0.6	0.6	0.6	0.6
Core diameter, μm		62.5±2.5	50±2.5	50.0±2.5	50.0±2.5
Cladding diameter, μm		125.0±2.0	125.0±1.0	125.0±1.0	125.0±1.0
Non-concentricity of fiber core and cladding, μm		3.0	1.5	1.5	1.5
Coating diameter, μm		245±10	245±10	245±10	245±10
Bandwidth 850 nm/1300 nm, MHz/km		160/500	500/500	1500/500	3500/500
Numerical aperture		0.275±0.015	0.200±0.015	0.200±0.015	0.200±0.015

Types of optical fibers in cable designations	General characteristic of optical fibers
E1 / G.652.B	Single-mode fiber with non-shifted dispersion according to Recommendation ITU-TG.652.B
E2 / G.654	Single-mode fiber with minimized losses according to ITU-TG.654
E3 / G.652.D+G.657.A1	Single-mode fiber with low-peak water optimized at wavelengths 1310, 1550, 1625 and 1383 nm according to Recommendations ITU-TG.652.D, reduced radius of bending according to Recommendation ITU-TG.657.A1
E3 / G.652.D	Single-mode fiber with low-peak water optimized at wavelengths 1310, 1550 and 1383 nm according to Recommendation ITU-TG.652.D
E4 / G.653	Single-mode fiber with shifted dispersion according to Recommendation ITU-TG.653
E5 / G.655	Single-mode fiber with shifted non-zero dispersion optimized at wavelengths 1550 и 1625 nm according to Recommendation ITU-TG.655
G.657.A1	Single-mode fiber with reduced radius of bending (Future Guide-SR15E) according to Recommendation ITU-TG.657.A1, has additional requirements as to losses at bends with radius of 15 mm
G.657.A2	Single-mode fiber with reduced bending radius (FutureGuide-BIS-B) according to Recommendation ITU-TG.657.A2, has additional requirements as to losses at bends with radius of 7.5 mm
G.657.B3	Single-mode fiber with reduced radius of bending acc. to Recommendation ITU-TG.657.B3 has additional requirements as to losses at bends with radius of 5 mm
OM1/ M2	Multimode fiber 62.5/125 with coefficient of wideband 500 MHz/km at wavelength 850 nm
OM2/ M1	Multimode fiber 50/125 with coefficient of wideband 500 MHz/km at wavelength 850 nm according to Recommendation ITU-TG.651.1
OM3/ M3	Multimode fiber 50/125 with coefficient of wideband 1500 MHz/km at wavelength 850 nm according to Recommendation ITU-TG.651.1
OM4/ M4	Multimode fiber 50/125 with coefficient of wideband 3500MHz/km at wavelength of 850 nm according to Recommendation ITU-TG.651.1

STANDARD COLOR IDENTIFICATION OF OPTICAL FIBERS IN TUBES

Number of fibers in a tube	2	4	6	8	10	12	16	24
Number of fibers in a tube	Natural	Natural	Natural	Natural	Natural	Natural	Natural	Natural
	Red	Red	Red	Red	Red	Red	Red	Red
		Dark blue	Dark blue	Dark blue	Dark blue	Dark blue	Dark blue	Dark blue
		Green	Green	Green	Green	Green	Green	Green
			Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
			Purple	Purple	Purple	Purple	Purple	Purple
				Orange	Orange	Orange	Orange	Orange
				Grey	Grey	Grey	Grey	Grey
					Blue	Blue	Blue	Blue
					Black	Black	Black	Black
						Brown	Brown	Brown
						Pink	Pink	Pink
Color of ring marking of fibers in tubes							Natural	Natural
							Red	Red
							Blue	Blue
							Green	Green
								Yellow
								Purple
								Orange
								Grey
								Blue
								White
								Brown
								Pink

BACKBONE AND BACKHAUL OPTICAL CABLES



MARKING OF BACKBONE AND BACKHAUL OPTICAL CABLES

Optical cables for underground laying

OKGM, OKGTS are designed for laying in soils of all categories, in cable channels, pipes, blocks, collectors, tunnels and shafts, in water when crossing swamps and non-navigable rivers.

OKKM, OKKTS are designed for laying in cable channels, pipes, blocks, collectors, tunnels, along bridges, and in shafts.

Aerial optical cables

OKSM, OKSTS are designed for suspension on poles of communication lines, contact networks of railways and of town electric transport, supports of radio transmission lines, poles of street lamps, between buildings and structures.

OKSD is designed for suspension on aerial power lines and contact networks of railways.

OKPM, OKPTS are designed for suspension on supports of com. lines, poles of street lamps, between buildings and structures.

OKPP is designed for suspension on aerial power lines, poles of street lamps, contact networks of town transport, supports of radio transmission lines, between buildings and structures, in cable channels, along building fronts.

Optical cables for laying in plastic pipes and for indoor installation

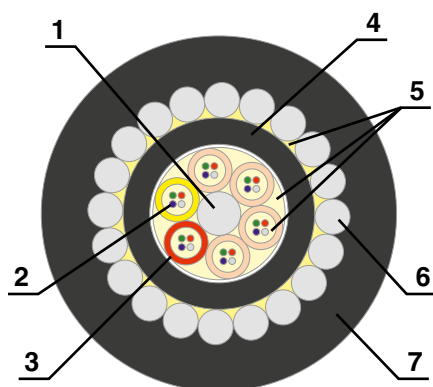
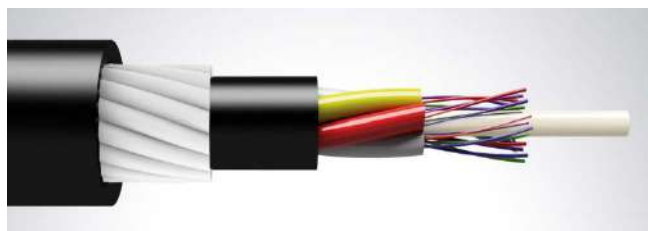
OKTM is designed for laying in plastic pipes.

OKTTS is designed for laying in cable channels, inside buildings and structures.

STRUCTURE OF MARKING OF BACKBONE AND DISTRIBUTION OPTICAL CABLES							
OK	G	M	ng(A)	- HF	-01	-3x4E3/...*	-(7.0) -T**
							Allowable tensile force (static), kN
							Number of OF x number of optical fibers in a tube
							Type of optical fiber:
							E1 - single-mode OF with non-shifted dispersion according to Recommendation ITU-TG.652.B
							E2 - single-mode OF with minimized losses according to Recommendation ITU-TG.654
							E3 - single-mode OF with low-water peak according to Recommendation ITU-TG.652.D, with reduced radius of bending according to Recommendation ITU-TG.657.A1 («Ace»); or single-mode OF with low-water peak according to Recommendation ITU-TG.652.D
							E4 - single-mode OF with shifted dispersion according to Recommendation ITU-TG.653
							E5 - single-mode OF with non-zero shifted dispersion according to Recommendation ITU-TG.655
							M1 (OM2) – multimode OF 50/125
							M2 (OM1) - multimode OF 62.5/125
							M3 (OM3) - multimode OF 50/125
							M4 (OM4) - multimode OF 50/125
							Designs:
							00 - single-tube, no central strength member
							01 - multi-tube, central strength member (or outer strength member for OKPM and OKPTS) – one or two (for cables OKPP) with GRP rods
							02 - multi-tube, central strength member or outer strength member (for OKPM and OKPTS) – steel strand
							03 - multi-tube, central strength member or outer strength member (for OKPM and OKPTS) – steel wire
							04 - multi-tube, outer strength member for OKPM and OKPTS – aramid filament
							Cable with PE fire-retardant sheath:
							n - in individual laying
							ng(A) - in bundle laying
							ng(A) - LS – in bundle laying, with low liberation of smoke and gas
							ng(A) - HF – in group laying, without liberation of corrosive gaseous products when burning and smoldering
							ng(A)-FR – fire resistant, flame-retardant in bundle laying
							ng(A)-LTx- flame-retardant in bundle laying, with low toxicity of combustion products
							ng(A)-FRHF – fire-resistant, flame-retardant in bundle laying, without liberation of corrosive gaseous products when burning and smoldering
							ng(A)-FRLS – fire-resistant, flame-retardant in bundle laying, with lower smoke and gas liberation
							ng(A)-HFLTx – flame-retardant in bundle laying, without liberation of corrosive products when smoldering and burning and with low toxicity of combustion products
							ng(A)-LSLTx – flame-retardant in bundle laying, with lower smoke and gas liberation and low toxicity of combustion products
							ng(A)-FRHFLTx – fire-resistant, flame-retardant in bundle laying, without liberation of corrosive products when burning and smoldering and with low toxicity of combustion products
							ng(A)-FRLSLTx – fire-resistant, flame-retardant in bundle laying, with lower smoke and gas liberation and low toxicity of combustion products
							Type of design:
							M - tube design
							TS - design with a central tube
							P - flat
							D - dielectric (certified by Federal network company UNIFIED ENERGY SYSTEM, for suspension on power lines)
							d - dielectric (armor made of GRP rods for cables OKGM, OKGTS)
							s - only for self-supporting cable, design with glass filament.
							Type of laying:
							G - optical cable for laying in soil.
							K - optical cable for laying in channels.
							P - suspension optical cable.
							S - self-supporting optical cable.
							T - optical cable for laying in pipes.
Optical cable							

Footnotes: * - When different types of optical fiber (E3..M2) are used, number of fibers of each type in tubes is given separately, T – outer sheath of OKSD is made of tracking-resistant PE.

Abbreviations: PE = polyethylene, OF = optical fiber, GRP = glass-reinforced plastic.



1. Central strength member.
2. Optical fiber.
3. Tube.
4. PE intermediate sheath
5. Jelly filler.
6. Round GRP rods.
7. Outer PE sheath.

- Declaration of conformity for cables type OKGMd
- Fire safety certificates for cables type OKGMd in categories:
 - n, -ng(A), -ng(A)-HF, -ng(A)-LS, -ng(A)-FR, -ng(A)-LTx,
 - ng(A)-FRHF, -ng(A)-FRLS, -ng(A)-HFLT_x, -ng(A)-LSLT_x,
 - ng(A)-FRHFLT_x, -ng(A)-FRLSLT_x.

Backbone optical cable with a central strength member made of GRP rod; around it are stranded tubes containing up to 24 optical fibers each and (if necessary) filling dummy tubes in an intermediate PE sheath; with armor made of round GRP rods and with an outer PE sheath.

If required by the customer, the cables are manufactured with fire-retardant PE sheath, with low liberation of smoke and gas, without liberation of corrosive gaseous products when burning or smoldering.

Employment:

The cable is designed for laying in soils of all categories, in cable channels, pipes, blocks, collectors, tunnels, shafts, in water when crossing swamps, lakes, and rivers.

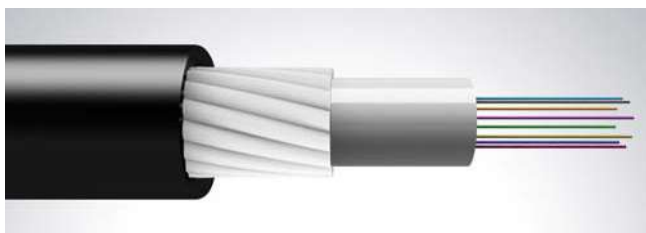
Service temperature for the cable is from -60 to 70°C.

Min. allowable temperature for laying is -30°C.

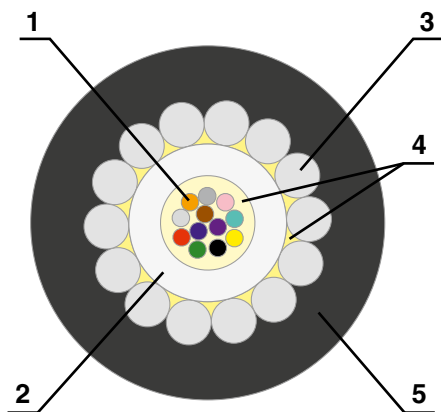
If required by the customer, it is possible to manufacture cable with other technical parameters.

Technical characteristics

Number of OF in a cable	Number of OF in a tube	Nominal calculated cable diameter, mm	Calculated cable weight, kg/km	Tensile force, kN	Crashing force, N/cm	Min. radius of cable bending, mm
OKGMd(n)-01-1x4...12x24...-(7.0)						
Up to 48	Up to 8	12.8	Up to 156	7.0	Not less than 400	256
Up to 64	Up to 8	13.6	Up to 179			272
Up to 96	Up to 12	15.9	Up to 211			318
Up to 144	Up to 12	19.5	Up to 290			390
Up to 288	Up to 24	26.9	Up to 553			538
OKGMd-01-1x4...12x24...-(7.0)						
Up to 48	Up to 8	12.8	Up to 150	7.0	Not less than 400	256
Up to 64	Up to 8	13.6	Up to 173			272
Up to 96	Up to 12	15.9	Up to 200			318
Up to 144	Up to 12	19.5	Up to 275			390
Up to 288	Up to 24	26.9	Up to 540			538



- Declaration of conformity for cables type OKGTSd
- Fire safety certificates for cables type OKGTSd in categories:
 - n, -ng(A), -ng(A)-HF, -ng(A)-LS, -ng(A)-FR, -ng(A)-LTx,
 - ng(A)-FRHF, -ng(A)-FRLS, -ng(A)-HFLTx, -ng(A)-LSLTx,
 - ng(A)-FRHFLTx, -ng(A)-FRLSLTx.



1. Optical fiber.
2. Central tube.
3. Round GRP rods.
4. Jelly filler.
5. Outer PE sheath

Backbone optical cable with a central tube containing up to 48 optical fibers, with armor made of GRP rods and outer PE sheath.

If required by the customer, the cable is manufactured with outer fire-retardant PE sheath, with lower smoke and gas liberation, without liberation of corrosive gaseous products when burning or smoldering.

Employment:

The cable is designed for laying in soils of all categories, in cable channels, pipes, blocks, collectors, tunnels, shafts, in water when crossing swamps, lakes, and rivers.

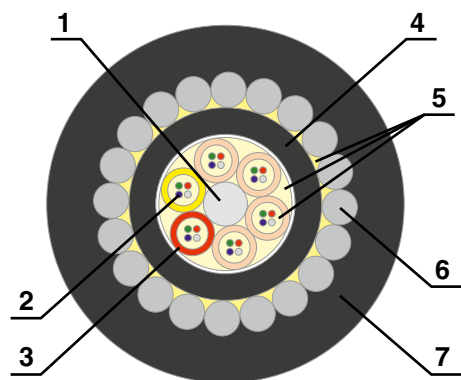
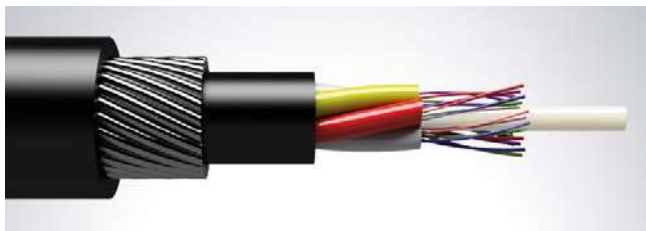
Service temperature for the cable is from -60 to 70°C.

Min. allowable temperature for laying is -30°C.

If required by the customer, it is possible to manufacture cable with other technical parameters.

Technical characteristics

Number of OF in a cable	Nominal calculated cable diameter, mm	Calculated cable weight, kg/km	Tensile force, kN	Crashing force, N/cm	Min. radius of cable bending, mm
OKGTSd(n)-00-1x4...1x48...-(4.0)					
Up to 48	10.2	Up to 205	4.0	Not less than 400	204
OKGTSd(n)-00-1x4...1x48...-(8.0)					
Up to 48	11.0	Up to 268	8.0	Not less than 400	220
OKGTSd-00-1x4...1x48...-(20.0)					
Up to 48	12.0	Up to 285	20.0	Not less than 400	240



1. Central strength member.
2. Optical fiber.
3. Tube.
4. Intermediate PE sheath.
5. Jelly filler.
6. Round steel wire.
7. Outer PE sheath.

- Declaration of conformity for cables type OKGM
- Fire safety certificates for cables type OKGM in categories:
 - n, -ng(A), -ng(A)-HF, -ng(A)-LS, -ng(A)-FR, -ng(A)-LTx,
 - ng(A)-FRHF, -ng(A)-FRLS, -ng(A)-HFLTx, -ng(A)-LSLTx,
 - ng(A)-FRHFLTx, -ng(A)-FRLSLTx.

Backbone optical cable with a central strength member made of GRP rod, steel strand or steel wire in PE sheath, with a central strength member made of GRP rod, steel strand, or steel wire in PE sheath (or without it); tubes containing up to 24 optical fibers and (if necessary dummy tubes) are wound around the strength member; in intermediate PE sheath, with armor made of round steel wires and with outer PE sheath.

If required by the customer, the cables are manufactured with outer fire-retardant PE sheath, with lower smoke and gas liberation, without liberation of corrosive gaseous products when burning or smoldering.

Employment:

The cable is designed for laying in soils of all categories, in cable channels, pipes, blocks, collectors, tunnels, shafts, in water when crossing swamps, lakes, and rivers.

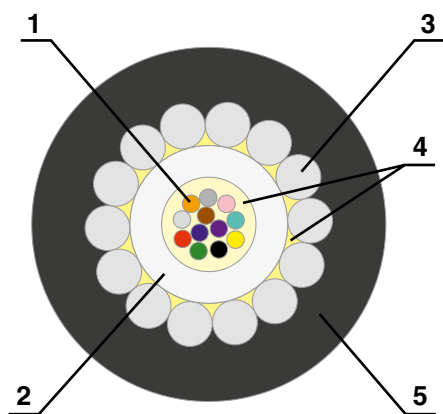
Service temperature for the cable is from -60 to 70°C.

Min. allowable temperature for laying is -30°C.

If required by the customer, it is possible to manufacture cable with other technical parameters.

Technical characteristics

Number of optical fibers in cable	Number of optical fibers in a tube	Nominal calculated cable diameter, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Min. radius of cable bending, mm
OKGM(n)-01-1x4...12x24...-(7.0)						
Up to 48	Up to 12	12.2	Up to 258	7.0	Not less than 400	244
Up to 64	Up to 8	13.6	Up to 321			272
Up to 96	Up to 12	15.9	Up to 477			318
Up to 144	Up to 12	19.5	Up to 756			390
Up to 288	Up to 24	26.9	Up to 1449			538
OKGM(n)-02-1x4...12x24...-(7.0)						
Up to 64	Up to 12	12.2	Up to 252	7.0	Not less than 400	244
Up to 96	Up to 12	15.9	Up to 482			318
Up to 144	Up to 12	19.5	Up to 761			390
Up to 288	Up to 24	26.9	Up to 1453			538
OKGM-01-1x4...12x12...-(20.0)						
Up to 48	Up to 12	14.8	Up to 357	20.0	Not less than 400	296
Up to 64	Up to 8	16.3	Up to 487			326
Up to 96	Up to 12	17.8	Up to 564			356
Up to 144	Up to 12	21.3	Up to 850			426
OKGM-01-1x4...12x12...-(80.0)						
Up to 64	Up to 8	21.5	Up to 905	80.0	Not less than 400	430
Up to 96	Up to 12	23.3	Up to 980			466



1. Optical fiber.
2. Central tube.
3. Round steel wire.
4. Jelly filler.
5. Outer PE sheath.

- Declaration of conformity for cables type OKGTS
- Fire safety certificates for cables type OKGTS in categories:
 - n, -ng(A), -ng(A)-HF, -ng(A)-LS, -ng(A)-FR, -ng(A)-LTx,
 - ng(A)-FRHF, -ng(A)-FRLS, -ng(A)-HFLTx, -ng(A)-LSLTx,
 - ng(A)-FRHFLTx, -ng(A)-FRLSLTx.

Backbone optical cable with a central tube containing up to 48 optical fibers, with armor made of round steel wires and outer PE sheath.

If required by the customer, the cables are manufactured with fire-retardant PE sheath, with lower smoke and gas liberation, without liberation of corrosive gaseous products when burning or smoldering.

Employment:

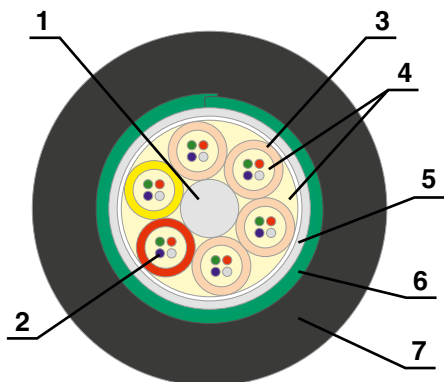
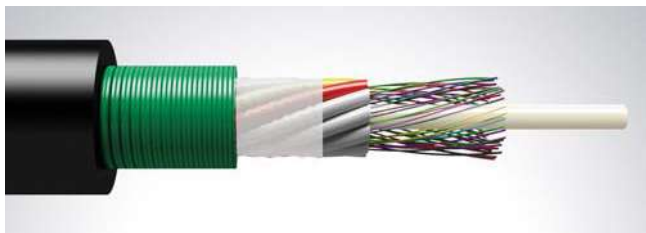
The cable is designed for laying in soils of all categories, cable channels, pipes, blocks, collectors, tunnels, shafts, in water when crossing swamps, lakes, and rivers.

Service temperature for the cable is from -60 to 70°C.
Min. allowable temperature for laying is -30°C.

If required by the customer, it is possible to manufacture cable with other technical parameters.

Technical characteristics

Number of fibers in cable	Nominal calculated cable diameter, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Min. radius of cable bending, mm
OKGTS(n)-00-1x4...1x48...-(4.0)					
Up to 48	10.2	Up to 205	4.0	Not less than 400	204
OKGTS(n)-00-1x4...1x48...-(8.0)					
Up to 48	11.0	Up to 268	8.0	Not less than 400	220
OKGTS-00-1x4...1x48...-(20.0)					
Up to 48	12.0	Up to 285	20.0	Not less than 400	240
OKGTS-00-1x4...1x48...-(80.0)					
Up to 48	20.2	Up to 856	80.0	Not less than 400	404



1. Central strength member.
2. Optical fiber.
3. Tube.
4. Jelly filler.
5. Water-blocking tape.
6. Steel corrugated tape.
7. Outer PE sheath.

- Declaration of conformity for cables type OKKM
- Fire safety certificates for cables type OKKM in categories:
 - n, -ng(A), -ng(A)-HF, -ng(A)-LS, -ng(A)-FR, -ng(A)-LTx,
 - ng(A)-FRHF, -ng(A)-FRLS, -ng(A)-HFLTx, -ng(A)-LSLTx,
 - ng(A)-FRHFLTx, -ng(A)-FRLSLTx.

Distribution optical cable with a central strength member made of GRP, steel strand or steel wire in PE sheath (or without it); around it are stranded tubes containing up to 24 optical fibers each and (if necessary) filling dummy tubes, with intermediate PE sheath or without it, with armor made of corrugated steel tape and with outer PE sheath.

If required by the customer, the cables are manufactured in fire-retardant PE sheath, with lower smoke and gas liberation, without liberation of corrosive gaseous products when burning or smoldering.

Employment:

The cable is designed for laying in cable channels, pipes, blocks, collectors, tunnels, along bridges and in shafts.

Service temperature for the cable is from -40 to 70°C.

Min. allowable temperature for laying is -30°C.

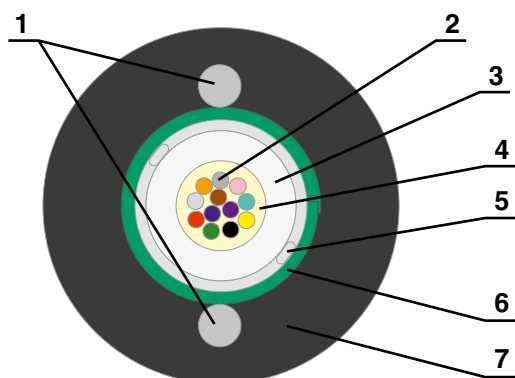
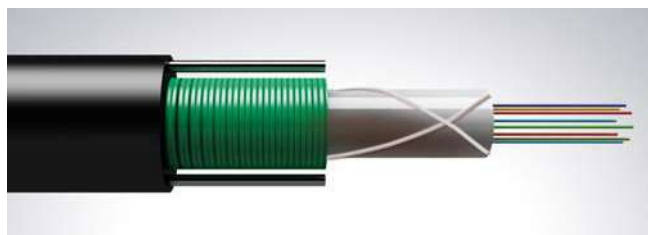
If required by the customer, it is possible to manufacture the cable with other technical parameters.

Technical characteristics

Number of optical fibers in cable	Number of optical fibers in a tube	Nominal calculated cable diameter, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Min. radius of cable bending, mm
OKKM(n)-01-1x4...12x24...-(2.7)						
Up to 48	Up to 8	10.9	Up to 117	2.7	Not less than 300	218
Up to 64	Up to 8	11.7	Up to 134			234
Up to 72	Up to 12	12.0	Up to 142			240
Up to 96	Up to 12	13.2	Up to 163			264
Up to 144	Up to 12	15.8	Up to 231			316
Up to 288	Up to 24	21.7	Up to 422			434
OKKM(n)-02-1x4...12x24...-(2.7)						
Up to 64	Up to 8	11.8	Up to 138	2.7	Not less than 300	236
Up to 72	Up to 12	12.6	Up to 156			252
Up to 96	Up to 12	13.2	Up to 168			264
Up to 144	Up to 12	15.8	Up to 236			316
Up to 288	Up to 24	21.7	Up to 427			434

OKKTS

OPTICAL CABLES FOR LAYING IN CABLE CHANNELS



1. Strength member – steel wire.
2. Optical fiber.
3. Central tube.
4. Jelly filler.
5. Water-blocking material (water-blocking filament).
6. Steel corrugated tape.
7. Outer PE sheath.

- Declaration of conformity for cables type OKKTS
- Fire safety certificates for cables type OKKTS in categories:
 - n, -ng(A), -ng(A)-HF, -ng(A)-LS, -ng(A)-FR, -ng(A)-LTx,
 - ng(A)-FRHF, -ng(A)-FRLS, -ng(A)-HFLTx, -ng(A)-LSLTx,
 - ng(A)-FRHFLTx, -ng(A)-FRLSLTx.

Backhaul optical cable with a central tube containing up to 48 optical fibers, with steel wire strength members, with armor made of steel corrugated tape and outer PE sheath.

If required by the customer, the cables are manufactured with outer PE fire-retardant sheath, with lower smoke and gas liberation, without liberation corrosive gaseous products when burning or smoldering.

Employment:

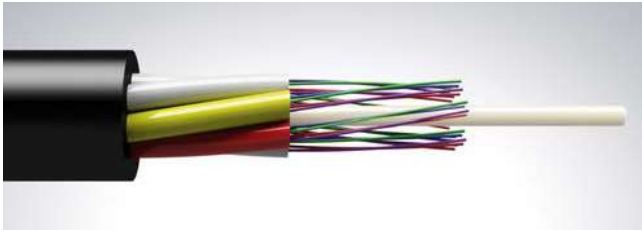
The cable is designed for laying in cable channels, pipes, blocs, collectors, tunnels, along bridges and in shafts. Service temperature for the cable is from -40 to 70°C. Min. allowable temperature for laying is -30°C.

If required by the customer, it is possible to manufacture the cable with other technical parameters.

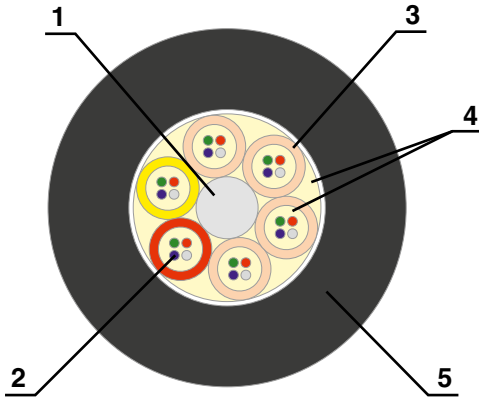
Technical characteristics

Number of fibers in cable	Nominal calculated cable diameter, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Min. radius of cable bending, mm
OKKTS(n)-00-1x4...1x48...-(2.7)					
Up to 48	10.7	Up to 117	2.7	Not less than 300	214

More than 190.000 km
of communication optical cables made by MKF
are in service in the Russian Federation now



- Declaration of conformity for cables type OKTM
- Fire safety certificates for cables type OKTM in categories:
 - n, -ng(A), -ng(A)-HF, -ng(A)-LS, -ng(A)-FR, -ng(A)-LTx,
 - ng(A)-FRHF, -ng(A)-FRLS, -ng(A)-HFLTx, -ng(A)-LSLTx,
 - ng(A)-FRHFLTx, -ng(A)-FRLSLTx.



1. Central strength member.
2. Optical fiber.
3. Tube.
4. Jelly filler.
5. Outer PE sheath.

Optical cable with a central strength member made of GRP rod, steel strand or steel wire in PE sheath (or without it); around it are stranded tubes containing up to 24 optical fibers each and filling dummy cords, with PE sheath.

It is possible to manufacture the cable with dry water-blocking elements.

If required by the customer, the cables are manufactured with outer fire-retardant PE sheath, with lower smoke and gas liberation and without liberation of corrosive gaseous products.

Employment:

The cable is designed for laying in cable channels, in plastic tubes. The cable in fire-retardant version is laid inside buildings and structures.

Service temperature of the cable is from -40 to 70°C.

Min. allowable temperature for laying is -10°C.

If required by the customer, it is possible to manufacture cable with other technical parameters.

Technical characteristics

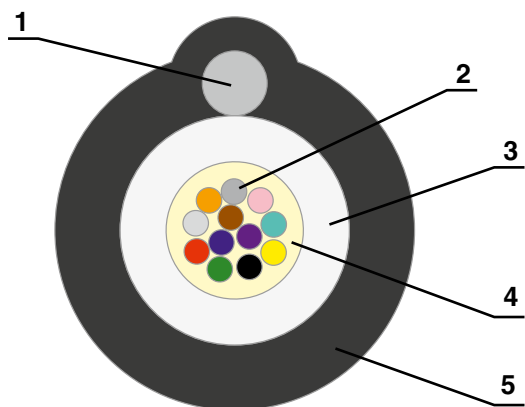
Number of optical fibers in cable	Number of optical fibers in a tube	Nominal calculated cable diameter, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Min. radius of cable bending, mm
OKTMn-01-1x4...12x24...-(1.0-2.7)						
Up to 72	Up to 12	10.0	Up to 81	1.0-2.7	Not less than 300	200
Up to 96	Up to 12	11.2	Up to 101			224
Up to 144	Up to 12	13.8	Up to 151			276
Up to 288	Up to 24	19.7	Up to 315			394
OKTMn-02-1x4...12x24...-(2.7)						
Up to 72	Up to 12	10.6	Up to 94	2.7	Not less than 300	212
Up to 96	Up to 12	11.2	Up to 105			224
Up to 144	Up to 12	13.8	Up to 155			276
Up to 288	Up to 24	19.7	Up to 319			394

OKTTS

INDOOR OPTICAL CABLES



- Declaration of conformity for cables type OKTTS
- Fire safety certificates for cables type OKTTS in categories: -n, -ng(A), -ng(A)-HF, -ng(A)-LS, -ng(A)-FR, -ng(A)-LTx, -ng(A)-FRHF, -ng(A)-FRLS, -ng(A)-HFLTx, -ng(A)-LSLTx, -ng(A)-FRHFLTx, -ng(A)-FRLSLTx.



1. Strength member – steel galvanized wire.
2. Optical fiber.
3. Central tube.
4. Jelly filler.
5. Outer fire-retardant PE sheath.

Indoor optical cable with a central tube containing up to 48 optical fibers, with a strength member made of steel wire and in outer fire-retardant PE sheath.

If required by the customer, the cables are manufactured in outer fire-retardant PE sheath, with lower smoke and gas liberation, without liberation of corrosive gaseous products when burning or smoldering.

Employment:

The cable is designed for laying in cable channels, inside buildings and structures.

Service temperature of the cable is from -40 to 70°C.

Min. allowable temperature for laying is -10°C.

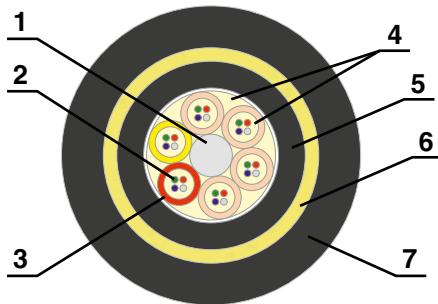
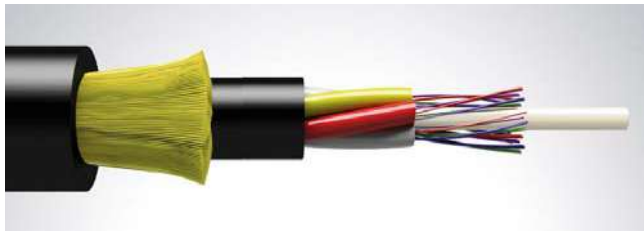
If required by the customer, it is possible to manufacture cable with other technical parameters.

Technical characteristics

Number of fibers in cable	Nominal calculated cable diameter, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Min. radius of cable bending, mm
OKTTSng(A)-HF-00-1x4...1x48...-(1.0)					
Up to 48	6.7x7.7	Up to 69	1.0	Not less than 300	176

More than 5.000.000 km
of optical fibers have been used in cables
manufactured by MKF





1. Central strength member.
2. Optical fiber.
3. Tube.
4. Jelly filler.
5. Intermediate PE sheath (it may not be available on cable with tensile force less than 8 kN).
6. Strength member – aramid filament.
7. Outer PE sheath.

- Declaration of conformity for cables type OKSM
- Fire safety certificates for cables type OKSM in categories: -n

Suspension optical cable, self-supporting, dielectric, with a central strength member made of FRP rod; around it are stranded tubes containing up to 24 optical fibers each and (if necessary) filling dummy tubes, with intermediate PE sheath or without it, with a strength member made of aramid filament, with outer PE sheath.

If required by the customer, the cables are manufactured in outer fire-retardant sheath, without liberation of corrosive gaseous products when burning or smoldering.

Employment:

The cable is designed for suspension on supports of communication lines, contact networks of railways and street light poles. Service temperature for the cable is from -60 to 70°C.

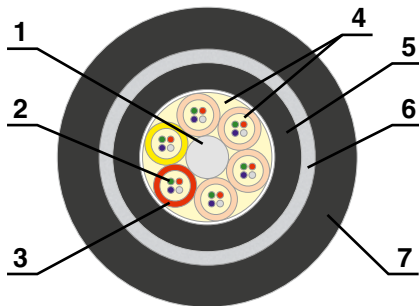
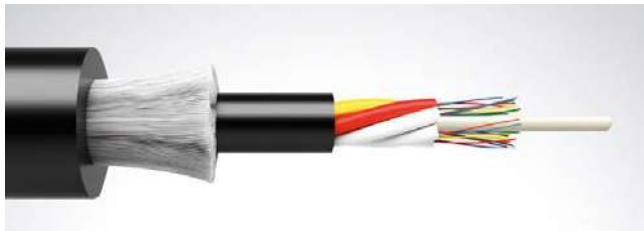
Min. allowable temperature for laying is -30°C.

If ordered, it is possible to calculate max. allowable tensile loads on the cable in regard to span lengths, cable slack sag and climatic conditions of the region of laying.

If required by the customer, it is possible to manufacture the cable with other technical parameters.

Technical characteristics

Number of optical fibers in cable	Number of optical fibers in a tube	Nominal calculated cable diameter, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Min. radius of cable bending, mm
OKSM-01-1x4...12x24...-(6.0)						
Up to 40	Up to 8	12.7	Up to 126	6.0	Not less than 300	254
Up to 48	Up to 8	13.0	Up to 134			260
Up to 64	Up to 8	14.6	Up to 167			292
Up to 72	Up to 12	13.6	Up to 147			272
Up to 96	Up to 12	15.2	Up to 183			304
Up to 144	Up to 12	18.5	Up to 268			370
OKSM-01-1x4...12x24...-(8.0)						
Up to 40	Up to 8	12.8	Up to 128	8.0	Not less than 300	256
Up to 48	Up to 8	13.1	Up to 136			262
Up to 64	Up to 8	14.6	Up to 169			292
Up to 72	Up to 12	13.7	Up to 149			274
Up to 96	Up to 12	15.3	Up to 185			306
Up to 144	Up to 12	18.6	Up to 271			372
OKSM-01-1x4...12x24...-(10.0)						
Up to 40	Up to 8	12.9	Up to 131	10.0	Not less than 300	258
Up to 48	Up to 8	13.2	Up to 139			264
Up to 64	Up to 8	14.8	Up to 173			296
Up to 72	Up to 12	13.8	Up to 152			276
Up to 96	Up to 12	15.4	Up to 188			308
Up to 144	Up to 12	18.6	Up to 273			372



1. Central strength member.
2. Optical fiber.
3. Tube.
4. Jelly filler.
5. Intermediate PE sheath (it may be not available on cable with tensile force less than 8 kN).
6. Strength member – glass filament.
7. Outer PE sheath.

- Declaration of conformity for cables type OKSMs
- Fire safety certificates for cables type OKSMs in categories: -n

Suspension optical cable, self-supporting, dielectric, with a central strength member made of GRP; around it are stranded tubes containing up to 24 optical fibers each and (if necessary) filling dummy tubes, with intermediate PE sheath or without it, with a strength member made of glass filament, with outer PE sheath.

If required by the customer, the cables are manufactured with an outer fire-retardant PE sheath, without liberation of corrosive gaseous products when burning or smoldering.

Employment:

The cable is designed for suspension on supports of communication lines, contact networks of railways and street lamps poles.

Service temperature of the cable is from -60 to 70°C.

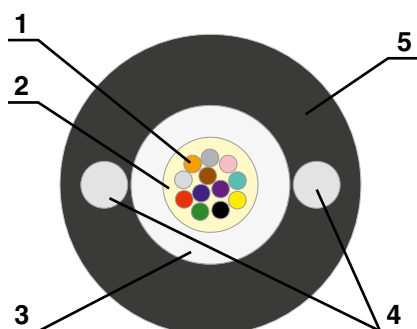
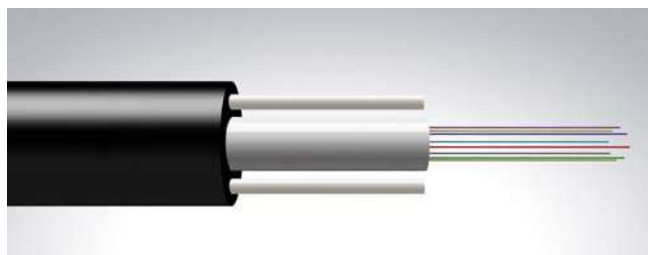
Min. allowable temperature for laying is -30°C.

If ordered, it is possible to calculate max. Allowable tensile loads on the cable in regard to span lengths, cable slack and climatic conditions in the region of laying.

If required by the customer, it is possible to manufacture cable with other technical parameters.

Technical characteristics

Number of optical fibers in cable	Number of optical fibers in a tube	Nominal calculated cable diameter, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Min. radius of cable bending, mm
OKSMs-01-1x4...12x12...-(6.0)						
Up to 40	Up to 8	13.6	Up to 133	6.0	Not less than 300	272
Up to 48	Up to 8	13.9	Up to 142			278
Up to 64	Up to 8	15.5	Up to 175			310
Up to 72	Up to 12	14.5	Up to 155			290
Up to 96	Up to 12	16.2	Up to 190			324
Up to 144	Up to 12	19.5	Up to 274			390
OKSMs-01-1x4...12x12...-(8.0)						
Up to 40	Up to 8	13.6	Up to 139	8.0	Not less than 300	272
Up to 48	Up to 8	13.9	Up to 148			278
Up to 64	Up to 8	15.5	Up to 181			310
Up to 72	Up to 12	14.5	Up to 161			290
Up to 96	Up to 12	16.2	Up to 197			324
Up to 144	Up to 12	19.5	Up to 280			390
OKSMs-01-1x4...12x12...-(10.0)						
Up to 40	Up to 8	13.6	Up to 144	10.0	Not less than 300	272
Up to 48	Up to 8	13.9	Up to 153			278
Up to 64	Up to 8	15.5	Up to 186			310
Up to 72	Up to 12	14.5	Up to 166			290
Up to 96	Up to 12	16.2	Up to 201			324
Up to 144	Up to 12	19.5	Up to 285			390



1. Optical fiber.
2. Jelly filler.
3. Central tube.
4. Strength member – two GRP rods.
5. Outer PE sheath.

- Declaration of conformity for cables type OKSTS

Suspension optical cable, self-supporting, dielectric, with a central tube containing up to 48 optical fibers, with a strength member made of two GRP rods, with PE outer sheath. An additional strength member made of aramid or glass filaments is added to cables with allowable tensile force from 3 kN and more.

If required by the customer, the cables are manufactured with fire-retardant PE sheath with lower smoke and gas liberation and without liberation of corrosive gaseous products when burning or smoldering.

Employment:

The cable is designed suspension and service on supports of aerial communication lines, street lamps poles, contact network of town electric transport, supports of radio transmitting network, between buildings and structures.

Service temperature for the cable is from -60 to 70°C.

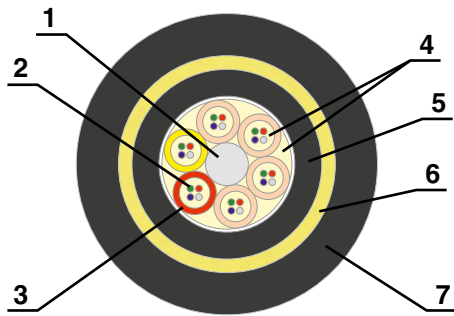
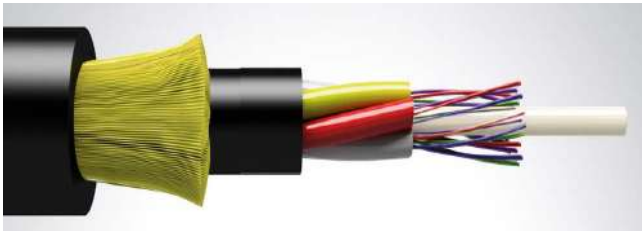
Min. allowable temperature for laying is -30°C.

If ordered, it is possible to calculate max. allowable tensile load on the cable in regard to span length, cable slack, and climatic conditions in the region of laying.

If required by the customer, it is possible to manufacture cable with other technical parameters.

Technical characteristics

Number of OF in a cable	Nominal calculated cable diameter, mm	Calculated cable weight, kg/km	Tensile force, kN	Crashing force N/cm	Min. radius of cable bending, mm
OKSTS-00-1x4...1x48...-(1.2)					
Up to 24	7.0	Up to 43	1.2	Not less than 300	140
Up to 48	8.8	Up to 67			176
OKSTS-00-1x4...1x48...-(8.0)					
Up to 24	8.2	Up to 65	8.0	Not less than 300	164
Up to 48	10.1	Up to 82			202
OKSTS-00-1x4...1x48...-(15.0)					
Up to 24	9.4	Up to 80	15.0	Not less than 300	188
Up to 48	11.2	Up to 105			224



- 1. Central strength member.
- 2. Optical fiber.
- 3. Tube.
- 4. Jelly filler.
- 5. Intermediate PE sheath.
- 6. Strength member- aramid filament.
- 7. Outer PE or tracking-resistant PE.

- Declaration of conformity for cables type OKSD
- Findings of the Attestation Commission of PAO "ROSSETI"

Suspension optical cable, self-supporting, dielectric, with a central strength member made of GRP rod; around it are stranded tubes containing up to 24 optical fibers each and (if necessary) filling dummy tubes with an intermediate PE sheath or without it, a strength member made of aramid filament, with outer PE sheath or tracking-resistant PE.

Employment:

The cable is designed for suspension on supports of aerial power lines, and communication lines, contact network of railways.

Service temperature for the cable is from -60 to 70°C.

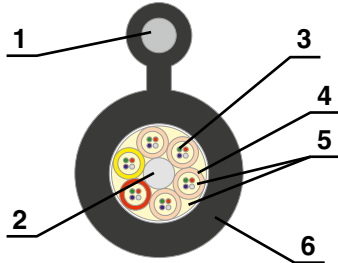
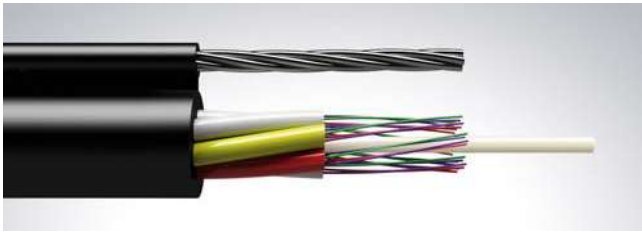
Min. allowable temperature for laying is -30°C.

If ordered, it is possible to calculate max. allowable tensile loads on the cable in regard to span length, cable slacks and climatic conditions in the region of laying.

If required by the customer, it is possible to manufacture the cable with other technical parameters.

Technical characteristics

Number of optical fibers in cable	Number of optical fibers in a tube	Nominal calculated cable diameter, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Min. radius of cable bending, mm
OKSD-01-1x4...12x24...-(4.0...25.0)-(T)						
Up to 48	Up to 8	15.0	Up to 204	25.0	Not less than 200	300
Up to 64	Up to 8	16.4	Up to 240			328
Up to 72	Up to 12	15.6	Up to 219			312
Up to 96	Up to 12	17.1	Up to 219			342
Up to 144	Up to 12	20.1	Up to 350			402
Up to 288	Up to 24	23.0	Up to 452			460
OKSD-01-1x4...12x24...-(25.0...45.0)-(T)						
Up to 48	Up to 8	16.2	Up to 245	45.0	Not less than 200	324
Up to 64	Up to 8	17.5	Up to 281			350
Up to 72	Up to 12	16.6	Up to 232			332
Up to 96	Up to 12	18.1	Up to 298			362
Up to 144	Up to 12	20.9	Up to 388			418
Up to 288	Up to 24	23.9	Up to 502			478



1. Outer strength member.
2. Central strength member.
3. Optical fiber.
4. Tube.
5. Jelly filler.
6. Outer PE sheath.

- Declaration of conformity for cables type OKPM

Suspension optical cable with a central strength member made of GRP rod, in PE sheath (or without it); around it are stranded tubes containing up to 24 optical fibers each and (if necessary) filling dummy tubes, with an outer strength member made of GRP rod, steel strand or steel wire, with outer PE sheath.

If required by the customer, the cables are manufactured with outer fire retardant sheath, without liberation of corrosive gaseous products when burning or smoldering.

Employment:

The cable is designed for suspension and service on supports of aerial communication lines, street lamp poles, contact networks of town electric transport, on supports of radio transmitting network, between buildings and structures.

Service temperature for the cable is from -60 to 70°C.

Min. allowable temperature for laying is -30°C.

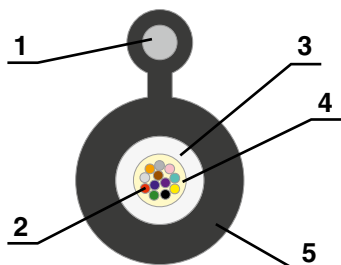
If required by the customer, it is possible to manufacture cable with other technical parameters.

Technical characteristics

Number of optical fibers in cable	Number of optical fibers in a tube	Cable dimensions/ Outer strength member diameter, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Min. radius of cable bending, mm
OKPM-02-1x4...12x24...-(4.0)						
Up to 20	Up to 4	9.7x20.7/4.2	Up to 146	4.0	Not less than 300	414
Up to 24	Up to 4	10.0x21.0/4.2	Up to 153			420
Up to 40	Up to 8	10.5x21.5/4.2	Up to 159			430
Up to 60	Up to 12	10.9x21.9/4.2	Up to 167			438
Up to 72	Up to 12	11.7x22.7/4.2	Up to 184			454
Up to 96	Up to 12	13.4x24.4/4.2	Up to 215			488
Up to 144	Up to 12	16.7x27.7/4.2	Up to 295			554
OKPM-02-1x4...12x24...-(9.0)						
Up to 20	Up to 4	9.7x19.7/6.5	Up to 168	9.0	Not less than 300	394
Up to 24	Up to 4	10.0x20.0/6.5	Up to 174			400
Up to 40	Up to 8	10.5x20.0/6.5	Up to 180			410
Up to 60	Up to 12	10.9x20.9/6.5	Up to 187			418
Up to 72	Up to 12	11.7x21.7/6.5	Up to 204			434
Up to 96	Up to 12	13.4x23.4/6.5	Up to 237			468
Up to 144	Up to 12	16.7x26.7/6.5	Up to 313			534
OKPM-02-1x4...12x24...-(12.0)						
Up to 20	Up to 4	9.7x19.7/6.5	Up to 199	12.0	Not less than 300	394
Up to 24	Up to 4	10.0x20.0/6.5	Up to 205			400
Up to 40	Up to 8	10.5x20.5/6.5	Up to 211			410
Up to 60	Up to 12	10.9x20.9/6.5	Up to 218			418
Up to 72	Up to 12	11.7x21.7/6.5	Up to 235			434
Up to 96	Up to 12	13.4x23.4/6.5	Up to 268			468
Up to 144	Up to 12	16.7x26.7/6.5	Up to 344			534



- Declaration of conformity for cables type OKPTS



1. Outer strength member.
2. Optical fiber.
3. Central tube.
4. Jelly filler.
5. Outer PE sheath.

Suspension optical cable with a central tube containing up to 48 optical fibers, with an outer strength member made of GRP rod, steel strand or steel wire, with outer PE sheath.

If required by the customer, the cables are manufactured with fire-retardant PE sheath, without liberation of corrosive gaseous products when burning or smoldering.

Employment:

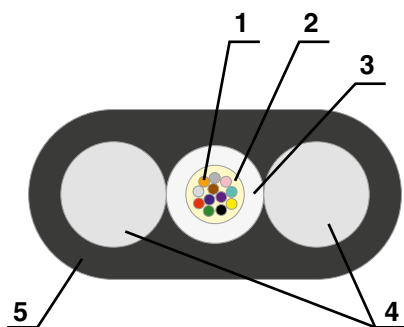
The cable is designed for suspension and service on supports of aerial communication lines, street lamp poles, contact network of town electric transport, supports of radio transmitting network, between buildings and structures.

Service temperature of the cable is from -60 to 70°C.
Min. allowable temperature for laying is -30°C.

If required by the customer, it is possible to manufacture the cable with other technical parameters.

Technical characteristics

Number of optical fibers in cable	Cable dimensions/ Outer strength member diameter, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Mim. radius of cable bending, mm
OKPTS-02-1x4...1x48...(4.0)					
Up to 48	6.8x13.0/4.2	Up to 76.2	4.0	Not less than 300	260
OKPTS-02-1x4...1x48...(6.0)					
Up to 48	6.8x13.6/4.8	Up to 93.3	6.0	Not less than 300	272
OKPTS-02-1x4...1x48...(9.0)					
Up to 48	6.8x14.2/5.4	Up to 115	9.0	Not less than 300	284



1. Optical fiber.
2. Jelly filler inside the tube.
3. Central tube.
4. Strength member in the form of GRP rods.
5. Outer PE sheath.

- Declaration of conformity for cables type OKPP

Suspension optical cable with a central tube containing up to 48 optical fibers, with a strength member made of two GRP rods, with outer PE sheath.

If required by the customer, the cables are manufactured with fire-retardant PE sheath, without liberation of corrosive gaseous products when burning or smoldering.

Employment:

The cable is designed for suspension and service on supports of aerial communication lines, street lamps poles, contact networks of town electric transport, supports of radio transmitting network, between buildings and structures. It is allowed to install the cable inside buildings, in cable channels, along buildings fronts. Service temperature for the cable is from -60 to 70°C. Min. allowable temperature for laying is -30°C.

If required by the customer, it is possible to manufacture the cable with other technical parameters.

Technical characteristics

Number of OF in a cable	Cable dimensions, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Mim. radius of cable bending, mm
OKPP-01-1x4E3-(1.2)					
4	3.4x6.8	28.0	1.2	Not less than 300	68
OKPP-01-1x8E3-(1.2)					
8	3.4x6.8	28.1	1.2	Not less than 300	68
OKPP-01-1x12E3-(1.2)					
12	3.7x7.8	34.5	1.2	Not less than 300	74
OKPP-01-1x16E3-(1.2)					
16	4.0x8.4	39.5	1.2	Not less than 300	80
OKPP-01-1x24E3-(1.2)					
24	4.3x9.3	46.3	1.2	Not less than 300	86

COMPOSITE COMMUNICATION OPTICAL CABLES



MARKING OF COMPOSITE OPTICAL CABLES

Composite optical cables

KSPP OKGM are designed for laying in soils of all categories, in cable channels, pipes, blocks, collectors, tunnels and shafts, when crossing swamps and non-navigable rivers.

KSPP OKKM are designed for laying in cable channels, pipes, blocks, collectors, in tunnels, along bridges and in shafts.

Aerial composite optical cables

SIP-3/OM, SIP-3/OTS are designed for suspension on supports of

communication lines, contact networks of railways, and street lamps poles.

KSPP OKPM are designed for suspension on supports of communication lines, street lamps poles, between buildings and structures.

Composite optical cables for laying by means of pneumatic blowing and indoor installation.

KSPP OKTM are designed for laying in plastic pipes.

STRUCTURE OF MARKING OF COMPOSITE CABLES WITH OPTICAL FIBERS AND COPPER CONDUCTORS							
KSPP	OK	G	M	ng(A)	-4Mx0,9/	-01	-3x4E3/...* -(7,0)
Allowable tensile force (static), kN							
Number of tubes x number of OF in a tube:							
Type of OF:							
E2 – single-mode OF with minimized losses according to Recommendations ITU-T G.654							
E3 – single-mode OF with low water peak according to Recommendations ITU-TG.652.D with a reduced radius of bending according to Recommendation ITU-TG.657.A1 («Ace»); or single-mode OF with low water peak according to Recommendation ITU-TG.652.D							
E4 – single-mode OF with shifted dispersion according to Recommendation ITU-T G.653							
E5 – single-mode OF with non-zero dispersion according to Recommendation ITU-T G.655							
M1 (OM2) – multimode OF 50/125							
M2 (OM1) – multimode 62.5/125							
M3 (OM3) – multimode 50/125							
M4 (OM4) – multimode 50/125							
Design:							
01 – multitube, central strength member (or outer member for KSPP OKPM)							
02 – multitube, central strength member (outer member, for KSPP OKPM), steel strand							
03 – multitube, central strength member (outer member for KSPP OKPM), steel wire							
04 – multitube, outer strength member, for OKPM and OKPTS –aramid filament							
Number of copper conductors x rated diameter of a copper conductor							
Fire-retardant PE sheath:							
n – in individual laying;							
ng(A) – in bundle laying;							
ng(A)-LS – in bundle laying with lower smoke and gas liberation;							
ng(A)-HF – in bundle laying without liberation of corrosive gaseous products when burning or smoldering							
Type of design:							
M – tube design							
Type of laying							
G – optical cable for laying in soil							
K – optical cable for laying in channels							
P – suspension optical cable							
T – suspension cable for laying in pipes							
Optical cable							
K – cable, S – local network, P – polyethylene sheath, P – protective PE sheath							

STRUCTURE OF MARKING OF COMPOSITE WIRE, SELF-SUPPORTING, PROTECTED, WITH OPTICAL PART						
SIP	-3	1x70	-20/	O	M	-16E3*
Number of OF						
Type of OF:						
E3 – single-mode OF with low water peak according to Recommendation ITU-TG.652.D with reduced radius of bending according to Recommendation ITU-TG.657.A1 («Ace»); or single-mode OF with low peak water according to Recommendation ITU-TG.652.D						
E5 – single-mode OF with non-zero shifted dispersion according to Recommendation ITU-T G.655						
M1 (OM2) – multimode OF 50/125						
M2 (OM1) – multimode OF 62.5/125						
M3 (OM3) – multimode OF 50/125						
M4 (OM4) – multimode OF 50/125						
Type of design:						
M – tube design						
TS – design with a central tube						
Optical part						
Rated voltage (kV)						
Number of conductors x rated cross-section of conductor (mm²)						
Type of wire design						
Self-supporting insulated wire						

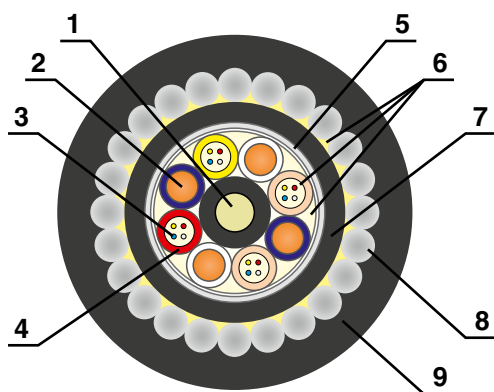
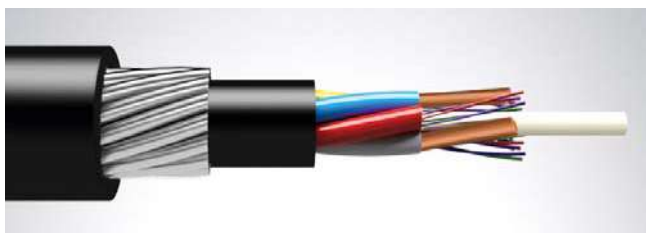
Footnotes:

* - if various types of optical fibers (E3...M1) are used, number of tubes and optical fibers in a tube of each type are shown separately.

Abbreviations: PE – polyethylene, OF – optical fiber, GRP – glass-reinforced polyethylene.

KSPP OKGM

COMPOSITE OPTICAL CABLES WITH COPPER CONDUCTORS FOR LAYING IN SOIL



1. Central strength member.
2. Insulated copper conductor.
3. Optical fiber.
4. Tube.
5. Laminated aluminum PE tape.
6. Jelly filler.
7. Intermediate PE sheath.
8. Round steel wire.
9. Outer PE sheath.

Backbone optical cable with a central strength member made of GRP rod in PE sheath; around it are stranded tubes containing up to 24 optical fibers each, filling dummy tubes (if necessary), insulated copper conductors, with a laminated aluminum polyethylene tape in intermediate PE sheath, with armor of round steel wires and outer PE sheath.

If required by the customer, the cables are manufactured with outer fire-retardant PE sheath with lower smoke and gas liberation, without liberation of corrosive gaseous products when burning or smoldering.

Employment:

The cable is designed for laying in soils of all categories, in cable channels, pipes, blocks, collectors, tunnels, in shafts, in water when crossing swamps, lakes, and rivers.

Service temperature for the cable is from -60 to 70°C.

Min. allowable temperature for laying is -30°C.

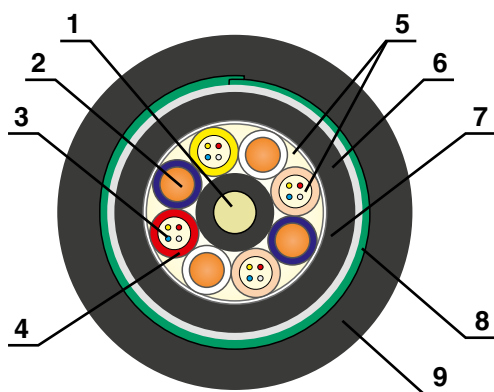
If required by the customer, it is possible to manufacture the cable with other technical parameters.

Technical characteristics

Number of optical fibers in cable	Number of optical fibers in a tube	Nominal calculated cable diameter, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Min. radius of cable bending, mm
KSPP OKGM(n)-4Mx0.9/01-1x4...4x24...(7.0)						
Up to 48	Up to 12	15.6	Up to 459	7.0	Not less than 400	312
Up to 96	Up to 24	20.3	Up to 682			406
KSPP OKGM(n)-4Mx1.2/01-1x4...4x24...(7.0)						
Up to 48	Up to 12	18.1	Up to 603	7.0	Not less than 400	362
Up to 96	Up to 24	20.3	Up to 693			406

KSPP OKKM

COMPOSITE OPTICAL CABLES WITH COPPER CONDUCTORS FOR LAYING IN CABLE CHANNELS



1. Central strength member.
2. Insulated copper core.
3. Optical fiber.
4. Tube.
5. Jelly filler.
6. Intermediate PE sheath.
7. Water-blocking tape.
8. Steel corrugated tape
9. Outer PE sheath.

Backhaul optical cable with a central strength member made of GRP rod in PE sheath; around it are stranded tubes containing up to 24 optical fibers each, filling dummy tubes (if necessary), insulated copper conductors with intermediate PE sheath, laminated aluminum PE tape, with armor made of steel corrugated tape and outer PE sheath.

If required by the customer, the cables are manufactured with an outer fire-retardant PE sheath, with lower smoke and gas liberation, without liberation of corrosive gaseous products when burning or smoldering.

Employment:

The cable is designed for laying in cable channels, pipes, blocks, collectors, tunnels, along bridges, and in shafts. Service temperature for the cable is from -60 to 70°C. Min. allowable temperature for laying is -30°C.

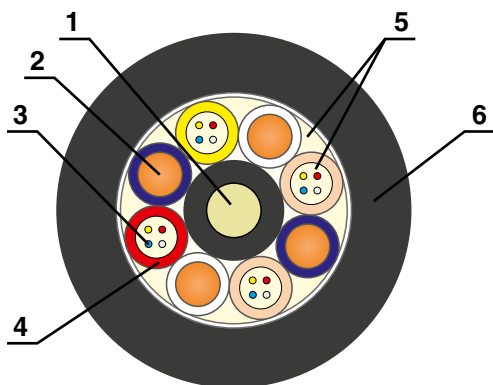
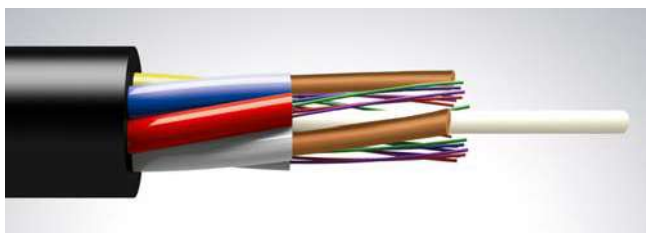
If required by the customer, it is possible to manufacture the cable with other technical parameters.

Technical characteristics

Number of optical fibers in cable	Number of optical fibers in a tube	Nominal calculated cable diameter, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Min. radius of cable bending, mm
KSPP OKKM(n)-4Mx0.9/01-1x4...4x24...-(2.7)						
Up to 48	Up to 12	14.4	Up to 220	2.7	Not less than 300	288
Up to 96	Up to 24	18.1	Up to 306			362
KSPP OKKM(n)-4Mx1.2/01-1x4...4x24...-(2.7)						
Up to 48	Up to 12	15.9	Up to 270	2.7	Not less than 300	318
Up to 96	Up to 24	18.1	Up to 335			362

KSPP OKTM

COMPOSITE OPTICAL CABLES WITH COPPER CORES FOR LAYING IN PLASTIC PIPES



1. Central strength member.
2. Insulated copper conductor.
3. Optical fiber.
4. Tube.
5. Jelly filler.
6. Outer PE sheath.

The optical cable with a central strength member, GRP rod around it are stranded tubes containing up to 24 fibers each, filling dummy tubes (if necessary) and insulated copper conductors with outer PE sheath.

If required by the customer, the cables are manufactured with an outer fire-retardant PE sheath, with low smoke and gas liberation, without liberation of corrosive gaseous products when burning or smoldering.

Employment:

The cable is designed for laying in cable channels and plastic pipes. The cable of fire-retardant version is laid inside buildings and structures.

Service temperature for the cable is from -60 to 70°C.

Min. allowable temperature for laying is -10°C.

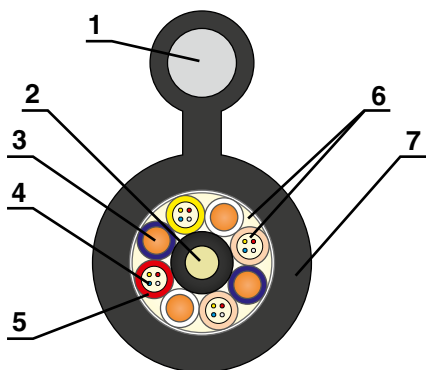
If required by the customer, it is possible to manufacture the cable with other technical parameters.

Technical characteristics

Number of optical fibers in cable	Number of optical fibers in a tube	Nominal calculated cable diameter, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Min. radius of cable bending, mm
KSPP OKTM(n)-4Mx0.9/01-1x4...4x24...(2.7)						
Up to 48	Up to 12	11.2	Up to 120	1.0 – 2.7	Not less than 300	224
Up to 96	Up to 24	14.9	Up to 188			298
KSPP OKTM(n)-4Mx1.2/01-1x4...4x24...(2.7)						
Up to 48	Up to 12	12.7	Up to 160	1.0 – 2.7	Not less than 300	254
Up to 96	Up to 24	14.9	Up to 204			298

KSPP OKPM

COMPOSITE OPTICAL CABLES WITH COPPER CONDUCTORS, SUSPENSION, WITH AN OUTER STRENGTH MEMBER



1. Outer strength member.
2. Central strength member.
3. Insulated copper conductor.
4. Optical fiber.
5. Tube.
6. Jelly filler.
7. Outer PE sheath.

Suspension optical cable with a central strength member made of GRP rod in PE sheath around which are stranded tubes containing up to optical fibers and (if necessary) filling dummy tubes, insulated copper conductors; with an outer strength member made of GRP rod, steel strand or steel wire, with an outer PE sheath.

If required by the customer, the cables are manufactured with an outer fire-retardant sheath.

Employment:

The cable is designed for suspension and for service on supports of aerial communication lines, street lamp poles, contact networks of town transport, supports of radio transmission lines, between buildings and structures.

Service temperature for the cable is from -60 to 70°C.

Min. allowable temperature for laying is -30°C.

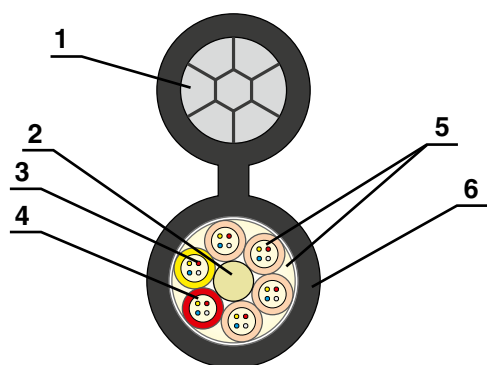
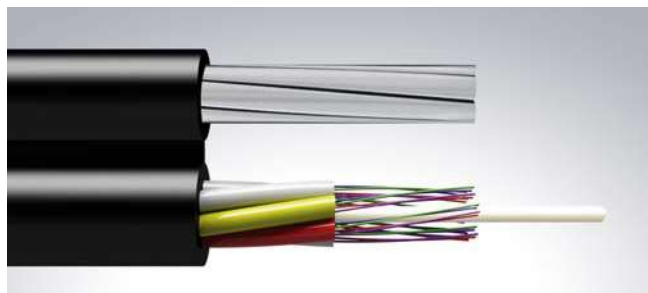
If required by the customer, it is possible to manufacture cable with other technical parameters.

Technical characteristics

Number of optical fibers in cable	Number of optical fibers in a tube	Cable dimensions/ Outer strength member diameter, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Min. radius of cable bending, mm
KSPP OKPM-4Mx0.9/-02-1x4...4x24...-(4.0)						
Up to 48	Up to 12	12.7x20.7/4.2	Up to 181	4.0	Not less than 300	414
Up to 96	Up to 24	14.9x21.0/4.2	Up to 222			420
KSPP OKPM-4Mx1.2/-02-1x4...4x24...-(4.0)						
Up to 48	Up to 12	12.7x20.7/4.2	Up to 193	4.0	Not less than 300	414
Up to 96	Up to 24	14.9x21.0/4.2	Up to 235			420
KSPP OKPM-4Mx0.9/-02-1x4...4x24...-(9.0)						
Up to 48	Up to 12	12.7x22.7/6.5	Up to 230	9.0	Not less than 300	454
Up to 96	Up to 24	14.9x24.9/6.5	Up to 270			498
KSPP OKPM-4Mx1.2/-02-1x4...4x24...-(9.0)						
Up to 48	Up to 12	12.7x22.7/6.5	Up to 241	9.0	Not less than 300	454
Up to 96	Up to 24	14.9x24.9/6.5	Up to 282			498
KSPP OKPM-4Mx0.9/-02-1x4...4x24...-(12.0)						
Up to 48	Up to 12	12.7x22.7/6.5	Up to 260	12.0	Not less than 300	454
Up to 96	Up to 24	14.9x24.9/6.5	Up to 300			498
KSPP OKPM-4Mx1.2/-02-1x4...4x24...-(12.0)						
Up to 48	Up to 12	12.7x22.7/6.5	Up to 271	12.0	Not less than 300	454
Up to 96	Up to 24	14.9x24.9/6.5	Up to 312			498

SIP-3/OM, SIP-3/OTS

COMPOSITE OPTICAL CABLES WITH A CONDUCTOR MADE OF ALUMINUM ALLOY, SELF-SUPPORTING, PROTECTED



1. Outer strength member (conductor of aluminum alloy SIP-3)
2. Central strength member.
3. Optical fiber.
4. Tube.
5. Jelly filler.
6. Outer PE sheath.

- Declaration of conformity for cables type SIP-3/OM
- Certificate of conformity ROSTEST for cable type SIP-3/OM and SIP-3/OTS for use on aerial lines power transmission with rated voltage 20 kV and 35 kV

Composite wire, self-supporting, protected, with a conductor made of aluminum alloy, with a central strength member made of GRP rod in PE sheath (or without it); around it are stranded tubes containing up to 24 optical fibers each and (if necessary) filling dummy tubes, with an outer sheath made of cross-linked light-stabilized PE.

If ordered, it is possible to manufacture the cable with a central tube containing up to 48 optical fibers.

If required by the customer, the wire can be hermetically sealed.

Employment:

The wire is designed for suspension and service on aerial lines supports for rated voltage 20 and 35 kV, in atmosphere of type I, II and III, with climatic solutions B according to GOST 15150-69, including the atmosphere over seas, salty lakes, in industrial regions and of saline sands.

Service temperature for the cable is from -60 to 70°C.

Min. allowable temperature for laying is -30°C.

If required by the customer, it is possible to manufacture cable with other technical parameters.

Technical characteristics

Number of optical fibers in cable	Number of optical fibers in a tube	Cable dimensions/ Outer strength member diameter, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Min. radius of cable bending, mm
SIP-3 1x70-20/OM -144...						
Up to 48	Up to 12	12.3x30.1/14.3	Up to 411	20.6	Not less than 300	602
Up to 96	Up to 12	14.8x32.6/14.3	Up to 463			652
Up to 144	Up to 12	18.1x35.9/14.3	Up to 543			710
SIP-3 1x70-35/OM -144...						
Up to 48	Up to 12	14.7x34.9/16.7	Up to 520	20.6	Not less than 300	698
Up to 96	Up to 12	17.2x37.4/16.7	Up to 581			748
Up to 144	Up to 12	20.5x40.7/16.7	Up to 673			814
SIP-3 1x70-20/OTS -48...						
Up to 24	Up to 24	8.9x26.7/14.3	Up to 418	20.6	Not less than 300	534
Up to 48	Up to 48	10.0x27.8/14.3	Up to 455			556
SIP-3 1x70-35/OTS -48...						
Up to 24	Up to 24	11.3x31.5/16.7	Up to 502	20.6	Not less than 300	630
Up to 48	Up to 48	12.4x32.6/16.7	Up to 555			652

OPTICAL CABLES FOR LANs



Suspension optical cables

OKDP with an outer strength member is designed for suspension on supports of aerial communication lines, street lamps poles, contact networks of fo electric town transport, radio transmission networks, for indoor installation inside buildings and structures.

Service optical cables

OKS is designed for laying in special cable basements, boxes, inside buildings and structures.

OKD is designed for laying in special cable ducts, boxes, outside and inside buildings and structures.

OKDP is designed for laying in special cable ducts, boxes, outside and inside buildings and structures.

Distribution optical cables

OKR is designed for laying in special cable ducts, boxes, outside and inside buildings and structures, including vertical installation.

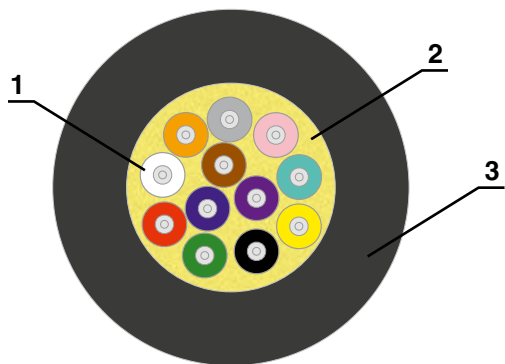
OKV is designed for indoor arrangement; it is laid vertically in risers of buildings and structures.

STRUCTURE OF CABLE MARKING FOR LANs						
OK	V	ng(A)	-02-	-1x4	G.657.A1	- B0,9 - -(1,0)
						Allowable tensile force (static), kN
						Special features of design (this column is not available in cable marking of OKDP):
						B – OF in tight buffer, the figure after the latter designate the outer diameter of one fiber in in tight buffer.
						M – microtubes are used in the cable, the figure after the letter designates the diameter of one microtube.
						3.0/0.9 – diameter of Simplex or dimensions of Duplex, height/diameter of optical fiber in tight buffer.
						Type of optical fiber:
						G.652.D – single-mode OF with low-water peak according to Recommendation ITU-TG.652.D
						G.653 - single-mode OF with shifted dispersion according to Recommendation ITU-T G.653
						G.654 – single-mode OF with minimized losses according to Recommendation ITU-T G.654
						G.655 – single-mode OF with non-zero shifted dispersion according to Recommendation ITU-T G.655
						G.657.A1 - single-mode OF with reduced radius of bending according to Recommendation ITU-T G.657.A1
						G.657.A2 - single-mode OF with reduced radius of bending according to Recommendation ITU-T G.657.A2
						G.657.B3- single-mode OF with reduced radius of bending according to Recommendation ITU-T G.657.B3
						OM1 – multimode OF 62.5/125 with a coefficient of wideband at wave length 850 nm 500 MHz•km
						OM2 – multimode OF 50/125 with a coefficient of wideband 850 nm 500 MHz•km according to Recommendation ITU-T G.651.1
						OM3 – multi-mode OF 50/125 with a coefficient at wave length 850 nm 1500 MHz•km according to Recommendation ITU-T G.651.1
						OM4 - multimode OF 50/125 with a coefficient of wideband at wave length of 850 nm 3500 MHz•km according to Recommendations ITU-T G.651.1
						Number of optical fibers or number of microtubes x number of OF in a micromodule. In designs with one bunch of fibers (without microtubes) the first figure in this column is not available.
						Engineering design (ONLY IN MARKING OF CABLES OKPD):
						00- strength members: 2 GRP rods
						01- strength members: 2 steel wires
						02 –outer strength member: steel wire and strength elements: 2 GRP rods
						03 - outer strength member: steel wire and strength elements: 2 steel wires
						04 - outer strength member: one GRP rod and strength elements: 2 GRP rods
						05 - outer strength member; one GRP rod and strength elements: 2 steel wires
						Sheath made of fire-retardant PE:
						ng(A) – in bundle laying
						ng(A)-LS – in bundle laying, with lower smoke and gas liberation
						ng(A)-HF – in bundle laying, without liberation of corrosive gaseous products when burning or smoldering.
						Type of design or employment:
						V – optical cable for vertical installation (type «Riser»)
						D – subscriber's optical cable (type «Duplex»)
						DP – optical cable, drop flat and drop flat with an outer strength member
						R – distribution optical cable (type «Distribution»)
						S – subscriber's optical cable (type «Simplex»)
						T – optical fiber in tight buffer
Optical cable						

Abbreviations: PE – polyethylene, OF – optical fiber, GRP – glass-reinforced plastic.

OKR (Distribution)

DISTRIBUTION OPTICAL CABLES



1. Optical fiber in tight-buffer.
2. High-modulus filament.
3. Outer PE or PVC fire-retardant sheath.

- Declaration of conformity for cables type OKR
- Fire safety certificates for cables type OKR in categories: -n, -ng(A), -ng(A)-HF, -ng(A)-LS, -ng(A)-FR, -ng(A)-LTx.

Distribution indoor optical cable containing up to 12 optical fibers in tight-buffer; a strength member – high-modulus filament is applied over it; with outer polymer sheath, fire-retardant in bundle laying, with lower smoke and gas liberation, without liberation of corrosive gaseous products when burning or smoldering. More strength members – GRP, steel wire can be added to the cable.

Employment:

The cable is designed for indoor and outdoor laying; it is laid in special cable ducts, boxes, outside and inside of buildings and structures, including vertical installation.

Service temperature for the cable is from -40 to 50°C.

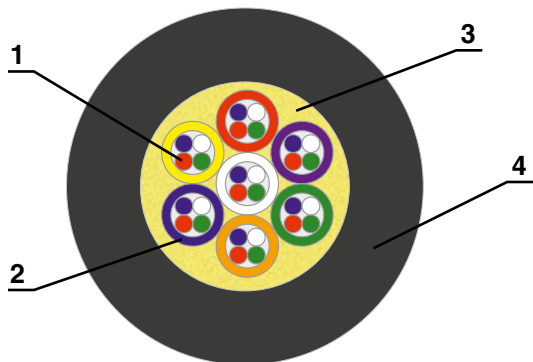
Min. allowable temperature for laying is -10°C.

Technical characteristics

Number of fibers in the cable	Nominal calculated cable diameter, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Min. radius of cable bending, mm
OKR-ng(A)-2...24G.652.DxB0.9-(0.5)					
2	4.5	22.0	0.5	Not less than 30	45
4	5.0	29.5			50
8	6.1	33.0			61
12	6.8	41.1			68
24	8.6	60.2			86

OKR (Distribution) with microtubes

DISTRIBUTION OPTICAL CABLES



1. Optical fiber.
2. Microtube
3. High-modulus filament.
4. Outer PE or PVC fire-retardant sheath

- Declaration of conformity for cables type OKR
- Fire safety certificates for cables type OKR in categories: -n, -ng(A), -ng(A)-HF, -ng(A)-LS, -ng(A)-FR, -ng(A)-LTx.

Distribution indoor optical cable containing up to 24 microtubes with optical fibers; each microtube can have up to 12 optical fibers; a strength member, high-modulus filament, is applied over the microtubes; with outer polymer sheath; fire-retardant in group laying, with lower smoke and gas liberation, without liberation of corrosive gaseous products when burning or smoldering. More strength members – GRP, steel wire can be added to the cable.

Employment:

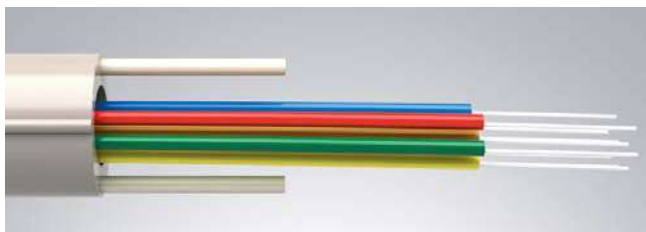
The cable is designed for indoor and outdoor laying; it is laid in special cable ducts, boxes, outside and inside buildings and structures, including vertical installation. Service temperature for the cable is from -40 to 50°C. Min. allowable temperature for laying is -10°C.

Technical characteristics

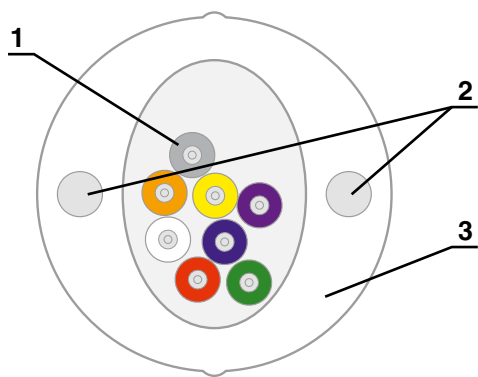
Number of OF in a cable	Nominal calculated cable diameter, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Min. radius of cable bending, mm
OKR-ng(A)-1x4...24x12...xM...(0.5)					
24	5.9	31	0.5	Not less than 30	59
36	6.6	36			66
48	7.2	42			72
64	8.0	51			80
96	9.1	61			91
144	10.7	79			107

OKV (Riser)

DISTRIBUTION OPTICAL CABLES



- Declaration of conformity for cables type OKV
- Fire safety certificates for cables type OKV in categories: -n, -ng(A), -ng(A)-HF, -ng(A)-LS, -ng(A)-FR, -ng(A)-LTx.



1. Optical fiber in tight-buffer.
2. GRP rods.
3. Outer PE or PVC fire-retardant sheath.

Indoor distribution optical cable with free access to optical fibers containing up to 24 optical fibers in polymer tight-buffer, fire-retardant in bundle laying, with low smoke and gas liberation, without liberation of corrosive gaseous products when burning or smoldering. There are two GRP rods in cable sheath as a strong member.

Employment:

The cable is designed for indoor arrangement and laid in vertical risers of building and structures.

Service temperature for the cable is from -10 to 50°C.

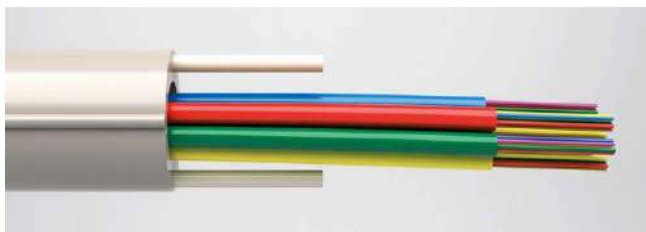
Min. allowable temperature for laying is -10°C.

Technical characteristics

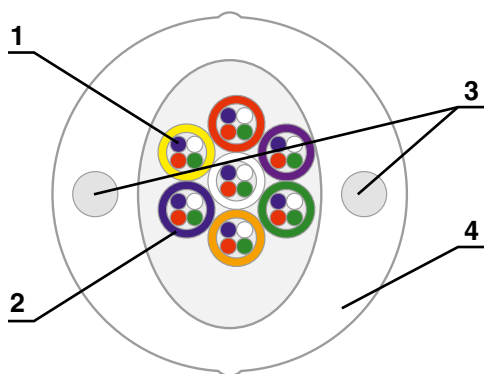
Number of OF in a cable	Nominal calculated cable diameter, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Min. radius of cable bending, mm
OKV-ng(A)-2...48G.657.A1XB0.9-(1.0)					
8	8.5	63.8	1.0	Not less than 200	85
12	8.5	64.8			85
24	10.5	91.1			105

OKV (Riser) with microtubes

DISTRIBUTION OPTICAL CABLES



- Declaration of conformity for cables type OKV
- Fire safety certificates for cables type OKV in categories: -n, -ng(A), -ng(A)-HF, -ng(A)-LS, -ng(A)-FR, -ng(A)-LTx.



1. Optical fiber.
2. Microtubes.
3. GFRP rods.
4. Outer PE or PVC fire-retardant sheath.

Indoor distribution optical cable with free access to optical fibers, containing up to 288 optical fibers laid in one or several microtubes, loosely laid in polymer sheath fire-retardant in bundle laying, with low smoke and gas liberation, not liberating corrosive gaseous products when burning or smoldering. There are two GFRP rods in cable sheath as a strength member.

Employment:

The cable is designed for indoor arrangement and laid in vertical risers of buildings and structures.

Service temperature for the cable is from -10 to 50°C.

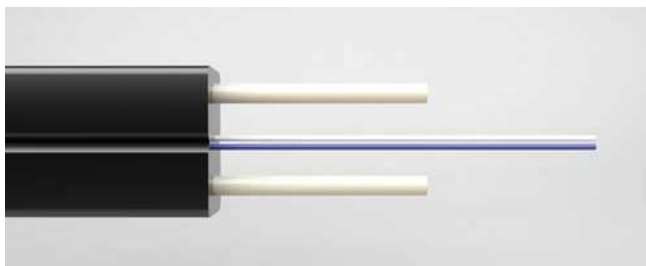
Min. allowable temperature for laying is -10°C.

Technical characteristics

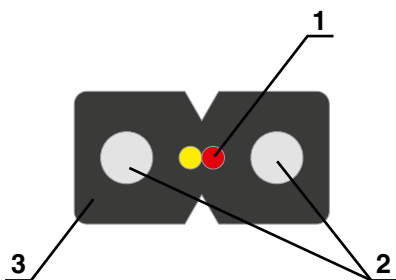
Number of OF in a cable	Number of OF in a micromodule	Nominal calculated cable diameter, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Min. radius of cable bending, mm
OKV-ng(A)-1x4...12x12G.657.A1xM...-(1.0)						
48	4	10.5	80.0	1.0	Not less than 200	105
	6					105
96	4	13.5	137.0			135
	6		137.5			135
144	4	13.5	145.0			135
	6		145.5			135
288	12	14.5	167.7			145

OKDP (Drop)

SUBSCRIBER'S OPTICAL CABLES



- Declaration of conformity for cables type OKDP
- Fire safety certificates for cables type OKDP in categories: -n, -ng(A), -ng(A)-HF, -ng(A)-LS



1. Optical fiber.
2. Strength member - steel galvanized wire or a GRP rod.
3. Outer sheath.

Indoor optical cable; optical fibers are loosely laid in the center of the cable; the sheath is made of fire-retardant PE, with low smoke and gas liberation, without liberation of corrosive gaseous products when burning or smoldering. Strength members (GRP rods or steel galvanized wire) are inside the sheath.

Employment:

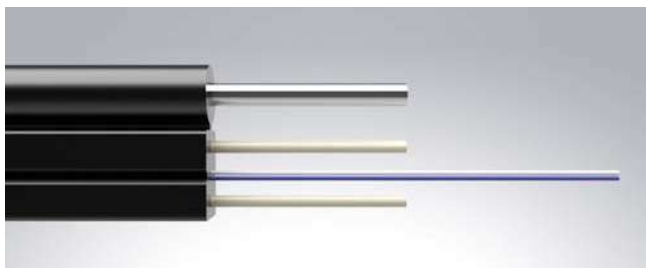
The cable for suspension and for laying in special cable ducts, boxes, outside and inside buildings and structures. Service temperature for the cable for outdoor laying is from -60 to 70°C. Min. allowable temperature for laying is -30°C.

Technical characteristics

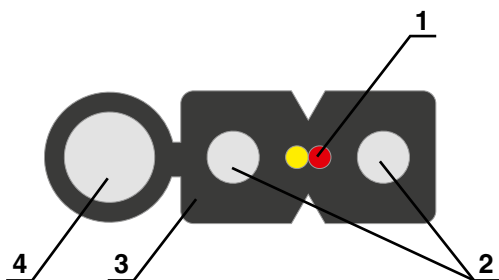
Number of fibers in a cable	Cable dimensions, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Min. radius of cable bending, mm
OKDP-ng(A)-HF-00-1..4G.657.A1-(0.22)					
1	2.0x3.0	8.9	0.22	Not less than 300	60
2	2.0x3.0	9.0			60
4	2.0x3.0	9.1			60

OKDP (Drop) with outer member

DISTRIBUTION OPTICAL CABLES WITH AN OUTER STRENGTH MEMBER



- Declaration of conformity for cables type OKDP
- Fire safety certificates for cables type OKDP in categories: -n, -ng(A), -ng(A)-HF, -ng(A)-LS



1. Optical fiber.
2. Outer sheath.
3. Outer strength member – steel galvanized wire or GRP rod.
4. Strength member – steel galvanized wire or a GFP.

Optical cable with an outer strength member made of galvanized wire or GRP rod. Optical fibers are loosely laid in the center of the cable; the sheath is made of fire-retardant PE, with low smoke and gas liberation, without liberation of corrosive gaseous products when burning or smoldering. Strength members (GRP rods or steel galvanized wire) are inside the sheath.

Employment:

The cable is designed for suspension on the supports of aerial communication lines, street lamp poles, contact networks of town transport, radio transmission supports, for laying inside buildings and structures.

Service temperature for the cable is from -60 to 70°C.

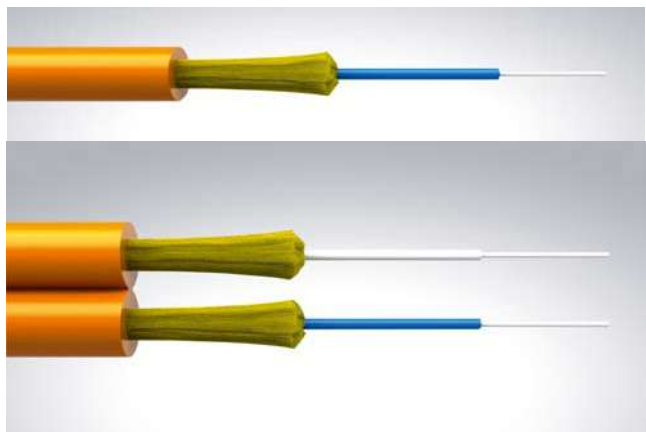
Min. allowable temperature for laying is -30°C.

Technical characteristics

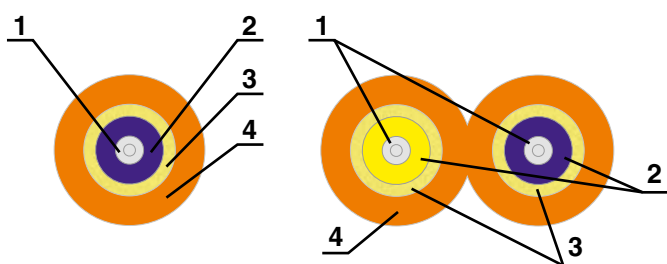
Number of fibers in a cable	Cable dimensions, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Min. radius of cable bending, mm
OKDP-ng(A)-HF-02-1.4G.657.A1-(1.0)					
1	2.0x5.0	19.0	1.0	Not less than 300	100
2	2.0x5.0	19.1			100
4	2.0x5.0	19.3			100

OKS (Simplex) OKD (Duplex)

SUBSCRIBER'S OPTICAL CABLES



- Declaration of conformity for cables type OKS
- Declaration of conformity for cables type OKD
- Fire safety certificates for cables type OKS, OKD in categories: -n, -ng(A), -ng(A)-HF, -ng(A)-LS, -ng(A)-FR, -ng(A)-LTx.



1. Optical fiber.
2. Buffer layer of polyamid, PE, PVC, or other materials.
3. High-modulus filament.
4. Outer fire-retardant PE or PVC sheath

Optical indoor cable consists of one or two optical fibers in tight buffer; a strength member – high-modulus filament is applied above it; in outer sheath made of polymer material, fire-retardant in group laying, with low smoke and gas liberation, without liberation of corrosive gaseous products when burning or smoldering.

Employment:

The cable is designed for indoor laying, manufacturing of optical cords and pigtails. It is laid in special cable ducts, boxes, inside buildings and structures.

Service temperature for the cable is from -10 to 50°C.

Min allowable temperature for laying is -10°C.

Technical characteristics

Number of fibers in a cable	Cable dimensions, mm	Calculated cable weight, kg/km	Tensile force, kN	Crushing force, N/cm	Min. radius of cable bending, mm
OKS-ng(A)-G.657.A1x1.8/0.9-(0.1)					
1	1.8	3.6	0.1	Not less than 50	According to specification for OF
OKS-ng(A)-G.657.A1x2.8/0.9-(0.1)					
1	2.8	8.0	0.1	Not less than 50	According to specification for OF
OKD-ng(A)-G.657.A1x1.8/0.9-(0.1)					
2	1.8x3.6	7.2	0.1	Not less than 50	According to specification for OF
OKD-ng(A)-G.657.A1x2.8/0.9-(0.1)					
2	2.8x5.6	16.0	0.1	Not less than 50	According to specification for OF

CONDITIONS OF TRANSPORTATION, UNLOADING AND STORAGE OF OPTICAL CABLE

1 REQUIREMENTS FOR TRANSPORTATION OF DRUM WITH CABLE

- 1.1 The cable must be transported in accordance with the requirements of GOST 18690-2012.
- 1.2 Conditions of cables transportation as regard to climatic factors must correspond to the conditions of storage 8 (OJZ) in accordance with GOST 15150.
- 1.3 It is prohibited to transport drums with wound cable flat-wise (on drum flange).
- 1.4 The manufacturer’s warranty does not apply to cable transported in violation of the above items.

2 REQUIREMENTS FOR UNLOADING OF DRUM WITH CABLE

- 2.1 Optical cable is a fragile commodity, as evidenced by the special marking “Fragile. Caution” on drum flange. While the unloading, it is necessary to protect the cable drum against external mechanical influence like impacts, vibration, etc.
- 2.2 While unloading, it is allowed to roll drum only in the direction indicated by the arrow on the outer side of the drum flange.
- 2.3 Cable should be unloaded from the vehicle with a forklift or lifting equipment.
- 2.4 If a mechanized method of unloading cable drums is impossible, it is allowed to roll out drums on the gangway with the help of a slings. Manual drums unloading by rolling them is allowed on condition that warehouse floor is at the same level with the floor of the car body or the wagon. If the warehouse floor is below the floor of the wagon or the car body, drums may be unloaded manually on thick poles or a gangway by two workers using strong ropes. By that the possibility of falling or hitting the drum with wound cable should be completely ruled out.
- 2.5 To throw off a drum with wound cable from the car body to the ground is strictly prohibited!

3 INCOME CONTROL AND PROCEDURE IN CASE OF NON-CONFORMANCE

- 3.1 After receiving cable the Buyer will carry out income control

according to the acceptance tests stipulated by the specifications mentioned in the supporting documentation.

- 3.2 The Buyer has the right to conduct additionally other tests stipulated by the specifications.
- 3.3 In case of non-conformance the Buyer prepares and sends AO MKF a claim containing: the name of Buyer’s organization, drum number, cable length, nature of non-conformity, date of finding of non-conformity, trade mark of the equipment and procedures measurements (tests).
- 3.4 Latent faults of the product may be found by the Buyer in the course of laying and installation of the cable. In this case the procedure is similar to that one described in section 3.3.

4 STORAGE OF DRUMS WITH CABLE

- 4.1 Conditions of storage of cables must correspond to storage conditions 5 (OJ4) according to GOST 15150-69.
- 4.2 Optical cable must be stored in Supplier’s packing at a place away from direct sunrays.

5 SAFETY REQUIREMENTS

The staff who deals with packing, loading, transportation, unloading, acceptance, storage, laying, and installation of optical cable must comply with the safety requirements stipulated by the internal documents of the organization responsible for these works.

6 MANUFACTURER’S WARRANTY

- 6.1 The manufacturer guarantees conformance of cables to requirements of specifications stated in the supporting documentation, subject to the Buyer’s compliance with the conditions of transportation, unloading, storage, installation and operation.
- 6.2 The warranty period is two (2) years from the date of commissioning, but not more than three (3) years from the date of delivery, unless otherwise specified in the contract.

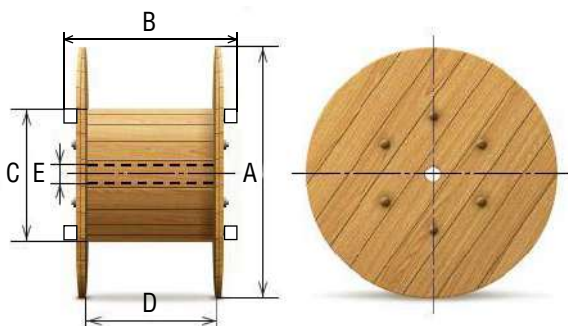


USEFEL INFORMATION

DIMENSIONS OF CABLE DRUMS

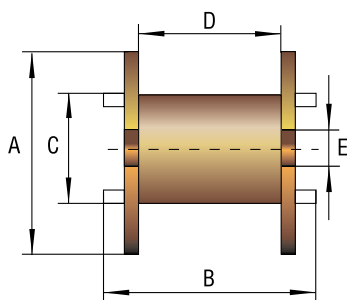
Dimensions of types of wooden drums and standard construction lengths given below will help you to determine optimal loading of vehicles.

Optical cables for backbone communication networks are supplied on wooden drums with regard to the ordered construction length. Butting of drums is done in accordance with GOST 18690; that ensures reliable protection of cable during transportation and storage.



Type of drums	Dimensions of a wooden drum, mm					Cable weight incl. batting, kg
	A	B	C	D	E	
10a	1000	880	500	710	50	75
12a	1220	880	650	710	70	151
14	1400	890	750	710	70	217
14r	1400	1080	750	900	70	266
16a	1600	980	800	800	80	295
17a	1700	1120	900	900	80	367
18a	1800	1140	900	900	80	494

Optical cables for LANs are supplied on plywood drums or in coils with regard to an ordered construction length. Package of plywood drums with polymer mats or technical film ensures reliable protection of cables.



Type of drums	Dimensions of plywood drums, mm				
	A	B	C	D	E
500	496	270	182	250	81
600	600	430	252	400	81
750	750	576	350	540	81

LENGTH OF OPTICAL CABLE WOUND ON DRUMS

The below tables give max. length of winding of optical cables on various types of drums depending on the diameter of optical cable. Cable length is shown in mm. The sign “-” means that it is not recommended to wind cable of a given diameter on the given type of the drum, as bending radius of the cable will be less than 20 diameters of the cable.

FOR LAN OPTICAL CABLES ON A PLYWOOD DRUMS

Diameter of optical cable, mm	Length of optical cable on a plywood drum, km		
	500	600	750
3	3.8	8.6	14.3
3.5	2.8	6.3	10.6
4.0	2.1	4.8	8.2
4.5	1.7	3.8	6.5
5.0	1.4	3.1	5.3
5.5	1.1	2.5	4.4
6.0	0.9	2.1	3.7



LENGTH OF WINDING OF OPTICAL CABLES ON DRUMS

The table gives max. lengths of winding of optical cable on various types of drums depending on the diameter of the optical cable. Cable length is given in km. The sign “-” means that it is not recommended to wind cable of a given diameter on the given type of the drum, as bending radius of the cable will be less than 20 diameters of the cable.

FOR OPTICAL CABLES WITH ROUND CROSS-SECTION

Diameter of optical cable, mm	Length of optical cable on a wooden drum, km							
	8a	10a	12a	14	14r	16a	17a	18a
6.0	2.7	8.8	12.8	17.0	21.5	26.8	32.7	38.5
6.5	2.3	7.5	10.9	14.5	18.4	22.9	27.9	32.9
7.0	2.0	6.5	9.4	12.5	15.9	19.8	24.1	28.4
7.5	1.8	5.7	8.2	10.9	13.9	17.2	21.1	24.8
8.0	1.6	5.0	7.2	9.6	12.2	15.2	18.5	21.8
8.5	1.4	4.4	6.4	8.5	10.8	13.5	16.4	19.4
9.0	1.2	4.0	5.7	7.6	9.7	12.0	14.7	17.3
9.5	1.1	3.6	5.2	6.9	8.7	10.8	13.2	15.5
10.0	1.0	3.2	4.7	6.2	7.9	9.8	11.9	14.0
10.5	0.9	2.9	4.2	5.6	7.1	8.9	10.8	12.7
11.0	0.8	2.7	3.9	5.1	6.5	8.1	9.9	11.6
11.5	-	2.4	3.5	4.7	6.0	7.4	9.0	10.6
12.0	-	2.2	3.2	4.3	5.5	6.8	8.3	9.8
12.5	-	2.1	3.0	4.0	5.0	6.3	7.7	9.0
13.0	-	-	2.8	3.7	4.7	5.8	7.1	8.3
13.5	-	-	2.6	3.4	4.3	5.4	6.6	7.7
14.0	-	-	2.4	3.2	4.0	5.0	6.1	7.2
14.5	-	-	2.2	3.0	3.8	4.7	5.7	6.7
15.0	-	-	2.1	2.8	3.5	4.4	5.3	6.3
15.5	-	-	2.0	2.6	3.3	4.1	5.0	5.9
16.0	-	-	1.8	2.4	3.1	3.8	4.7	5.5
16.5	-	-	-	2.3	2.9	3.6	4.4	5.2
17.0	-	-	-	2.2	2.7	3.4	4.2	4.9
17.5	-	-	-	2.0	2.6	3.2	3.9	4.6
18.0	-	-	-	1.9	2.4	3.0	3.7	4.4
18.5	-	-	-	1.8	2.3	2.9	3.5	4.1
19.0	-	-	-	-	2.2	2.7	3.3	3.9
19.5	-	-	-	-	2.1	2.6	3.2	3.7
20.0	-	-	-	-	2.0	2.5	3.0	3.5
20.5	-	-	-	-	-	2.3	2.9	3.4
21.0	-	-	-	-	-	2.2	2.7	3.2

FOR OPTICAL CABLES WITH AN OUTER STRENGTH MEMBER

Dimensions of optical cables, mm*	Length of optical cable on a wooden drum, km*							
	8a	10a	12a	14	14r	16a	17a	18a
5 x 11.2	1.6	5.2	7.6	10.1	12.8	15.9	19.4	18.4
5.7 x 11.9	1.4	4.4	6.3	8.4	10.7	13.3	16.2	15.3
5 x 11.8	1.5	5.0	7.2	9.6	12.2	15.1	18.5	17.5
5.7 x 12.5	1.3	4.2	6.0	8.0	10.2	12.7	15.5	14.6
5 x 12.4	1.5	4.7	6.9	9.1	11.6	14.4	17.6	16.6
5.7 x 13.1	1.2	4.0	5.8	7.7	9.7	12.1	14.8	14.0
9.5 x 19.5	0.5	1.7	2.4	3.2	4.1	5.1	6.2	7.3
10.3 x 20.3	0.5	1.5	2.1	2.9	3.6	4.5	5.5	6.5
10.7 x 20.7	0.4	1.4	2.0	2.7	3.4	4.3	5.2	6.1
11.5 x 21.5	-	1.3	1.8	2.4	3.1	3.8	4.7	5.5
13.2 x 23.2	-	-	1.5	2.0	2.5	3.1	3.8	4.5
16.5 x 26.5	-	-	-	1.4	1.8	2.2	2.7	3.2

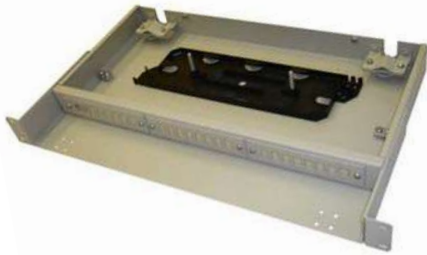
AUXILIARY EQUIPMENT



Optical distribution frames of rack type, series KS 19-21".

Type KS is manufactured with height of 1U, 2U, 3U, 4U; frames are designed for 24, 48, 96, 144 ports respectively.

They are assembled in various sets - from 4 to 288 ports. They may be equipped with stationary as well as changeable modules (panels); the latter are designed for 4 and 8 ports. Eight ports can be with modules-plugs. There is a removable shelf in the set of the distributing frame. It is possible to install patch panels of various types into one box, including those ones for 4 ports and couplings.



- Possibility of replacement the bracket 19" for bracket 21";
- Direct cable input which makes it possible to input up to 4 cables into single-unit body;
- Splice cassette K-10 is installed into the body; the capacity of the cassette is 16 fusion connections; the cassette is closed with a metal cover for protection;
- The set includes cable ties and platforms instead of standard organizers which makes it possible to lay out cable more convenient.

Model	Dimensions, mm	Amount	Number of cable ports	Weight
KS-24-1U KSu-24-1U	410x220x44 without shelf 410x285x44 With a shelf 412x220x44 - KSu	4-24	2	Up to 2.7kg
KSu-48-2U	410x220x48 without a shelf 410x285x84 with a shelf	4-48	4	Up to 3.7 kg
KSu-96-3U	410x220x132 without a shelf 410x285x132 with a shelf	4-96	6	Up to 4.1 kg
KSu-144-4U	410x266x176	16-144	6	Up to 5.0 kg

Optical distribution frames of rack type, series KSu.

- Installation of patch panels with the use of plastic clips which makes replacement and cleaning of adapters.
- Multi-purpose cable input of box type which makes possible to reduce losses when connecting cable.
- The brackets are fastened on runners which make possible to put the distributing frame inside the rack.

Sliding distribution frame of rack type, series KSv.

Type KSv is manufactured with height 1U and 2U and is designed for 16, 24, 32 and 48 ports.



- Sliding base which makes assembly and check-up of connections easier. It is needless to pull-out equipment available inside from the rack in his version.
- It offers selection between stationary and changeable patch panels (the stationary panel is for 24 and 48 ports, changeable panel is for 16 and 32 ports respectively).
- There is a lock which makes possible to securely protect the distribution frame from outside interference.

Model	Dimension, mm	Number of ports	Number of cable inputs	Weight
KSv-16-1U	432x300x44	16	2	Up to 3.2 kg
KSv-24-1U	432x300x44	24	2	Up to 3.2 kg
KSv-32-2U	432x300x88	32	4	Up to 4.0 kg
KSv-48-2U	432x300x88	48	4	Up to 4.0 kg

Wall-type distribution frames, series KN, assembled, from 4 to 96 ports










There are six basic models - KN-8, KNz-8, KH-16, KN-32, KH-48, KN-96. Except KN-8 (type MINI), all frames are equipped with locks.



- KN-16, KN-32, KN-48, KN-96 are with changeable modules or plugs.
- There is a flap side for easier assembly.
- It is possible to install patch panels of various types in one body, including modules with 4 ports and plugs.





Model	Dimensions, mm	Number of ports	Number of cable inputs	Weight
KN -mini	163x50x123	4-8	1	Up to 0.7 kg
KNz-8	268x68x230	4-8	2	Up to 1.7 kg
KN-16	350x60x305	4-16	2	Up to 2.0 kg
KN-32	330x75x330	4-32	4	Up to 2.7 kg
KN-48	350x105x330	4-48	4	Up to 4.0 kg
KN-96	350x135x435	8-96	4	Up to 5.5 kg

ACCESSORIES FOR SUSPENSION CABLES

Appearance	Designations	Max. outer diameter of supporting wire, mm	Max. breaking load, kN	The length of strand from the clamp to the fastener, mm	Material		Weight, kg
					Body	Wedges	
Anchor terminal clamps for 8-shaped cables, with an outer strength member made of strand, GRP, or wire							
	RA 06 200	Up to 6	2.3	200	UV-resistant polymer		0.12
	RA 06 200M	Up to 6	3	200	Zink alloy		0.095
	RA 35 200	3-5	3.5	200-300	UV-resistant polymer	High-stress aluminum alloy	0.14
	RA 57 200	5-7	3.5	200-300			0.14
	RA 610 CM	6-10	7	300	0.7		
	RA 07 250	Up to 7	7.3	250-300	0.27		
	RA 07 250M	Up to 7	5.0	250	0.135		
	RA 09 250M	Up to 7	6.5	250	0.24		
	RA 10 300	Up to 10	16	300	0.46		
Clamps for flat and drop cables (OKPP, OKDP, OKDP with an outer strength member)							
	ODWAC	Cable width 2-11 mm	0.08	115-135	Terminal clamp. The body is made of galvanized steel/aluminum alloy.		0.03
	KP-015/ AS-3P	1-5	-	60	The loop is made of chromium-plated steel		-
Supporting clamps for 8-shapes cables with an outer strength member made of strand, GRP or wire as well as for round coaxial cable							
	BAV 3-7	Up to 3-8	2.5	For fastening on CSC 12(S) bracket with a hook	Steel 2 mm. Dimension (9,5x5 cm) in climatic version UHL1 with coating TD, class 25, type I (coated with zinc)		0.2
Заземляющий коннектор для 8-образных кабелей с выносным элементом							
	CMT 113	3-11	Earthing of insulated and bare supporting steel wires		Corrosion-resistant metal alloy and shielded steel		0.1
Натяжные (не спиральные зажимы для самонесущего диэлектрического оптического кабеля)							
	RA 140, FO400	from 11-15.3	7	400	High-stress aluminum alloy	UV-resistant polymer	0.35
	RA 190, FO400	from 14-19	7	400			0.6
Поддерживающие (не спиральные) зажимы для самонесущего оптического кабеля (диэлектрического, телекоммуникационного и коаксиального)							
	SMSD ADSS	from 10-20	2	For fastening to the angle	Holder, body, belt: UV-resistant polymer.		0.41
	SS 1025B SS 1025D	from 10-20	5	For fastening to CSC 12(S) bracket with a hook			0.1

ADDITIONAL ELEMENTS AND INSTRUMENTS FOR FASTENING CABLES:

- Turn-buckle
- Extension socket
- Galvanized shackle
- Galvanized omega-shaped shackle
- Tool with screw mechanism for setting steel tape
- Tool for gripping cable for straining
- Tool for straining cable
- Electronic dynamometer
- Hand cable cutter
- Supporting rollers
- Mounting rollers
- Stainless steel in a container
- Shackle and locks for steel tape

Appearance	Designation	Cable diameter, mm	Strain, kN	Sets, material	Weight, kg
Terminal spiral clamps for self-supporting optical cable, type OKSM, OKSD					
	Terminal spiral clamps without protector for short spans, 50-60 m				
	NSO S 1050, 1150, 1250, 1300, 1350, 1450, 1500, 1600, 1700, 1800	10.5-18.8	6	Spiral clamp, Thimble – hot-dip galvanized steel	0.405-0.408
	Terminal spiral clamps with protectors for short spans - 50-60 m. Strength of clamp attachment up to 20 kN				
	GTADSS SRU 1050G, 1150G, 1250G, 1290G, 1350G, 1420G, 1510G, 1600G DTADSS S 1050L, 1150L, 1250L, 1290L, 1350L, 1420L, 1510L, 1600L	10.7-17.0	10-15	Spiral clamp, protector. Bolts: hot-dip galvanized steel. Thimble: hot-dip galvanized steel	1.570-1.735
	Terminal spiral clamps with a protector for medium spans. Strength of clamp attachment up to 40 kN				
	GTADSS MRU 1300, 1350, 1390, 1450, 1510 DTADSS M 1230L, 1300L, 1350L, 1390L, 1450L, 1510L, 1600L	12.3-16.9	20-24	Spiral clamp, protector. Bolts: hot-dip galvanized steel. Thimble: hot-dip galvanized steel	2.790-3.100
	Terminal spiral clamps with a protector for long spans up to 350 m. Strength of clamp attachment up to 60 kN				
	GTADSS LRU 1370, 1450, 1720 DTADSS L 1300L, 1370L, 1450L, 1510L, 1560L, 1620L DTADSS LS 1950L	13.0-18.1 19.5-20.5	24-50 120	Spiral clamp, protector. Bolts: hot-dip galvanized steel. Thimble; hot-dip galvanized steel.	5.980-6.100 7.650
Suspension spiral clamps for self-supporting optical, type OKSM, OKSD					
	Suspension spiral clamps without protectors for short spans - 50-60 m				
	PSO 1050, 1150, 1250, 1300, 1350, 1450, 1500, 1600, 1700, 1800	10.5-18.4	6	Spiral clamp, Ring thimble: aluminum alloy.	0.190-0.240
	Suspension spiral clamps with a protector for short spans - 50-60 m				
	GTSPRADSS 1050G, 1150G, 1250G, 1290G, 1350G, 1420G, 1510G DTSPR S 1050L, 1150L, 1250L, 1290L, 1350L, 1420L, 1510L	10.7-17.0	10-15	Spiral clamp, protector. Bolts: hot-dip galvanized steel. Ring thimble: hot-dip galvanized steel	0.685-0.850
	Suspension spiral clamps with a protector for medium and long span				
	SAR 90-136 – SAR 166-199 + GSAR + AAR SAR DTSPR M 1300, 1350, 1390, 1450, 1510, 1560 CH 16S GR + SAR166-199C GR + GSAR188-199 + AAR SAR 1950	13.0-18.2 13.0-17.0 19.5-20.5	20-50 20-50 120	Clamp body, heavy-duty spiral: aluminum alloy; neoprene insert is resistant to extreme climatic conditions. Bolts; of hot-dip galvanized steel	1.970-3.300 2.820
Vibration dampers					
	FR 35 "Stockbridge"	15-30 c with protector	Max. value for tightening bolt: 0.4	Железо горячего цинкования + сплав алюминия	2.750
Spiral vibration dampers					
	PSVD 083 PSVD 117	8.3-11.7 11.7-14.3	Vibration damper, spiral is made of UV-resistant PVC		0.320

BRACKETS, FASTENERS:

- Multi-purpose anchor bracket for fastening terminal and suspension clamps. Tension
- Tension brackets for fastening terminal and suspension clamps: SAA 12 (up to 20 kN) and UK-N-01 (up to 10 kN), CASHT
- Bracket for a hook, bracket for suspension clamps for BAV-3-7: CSC 12S (up to 12 kN) and UK-P-02 (up to 2 kN)
- Light-weight bracket with a hook. Bracket for suspension clamps and for BAV-3-7.
- Light-weight bracket for fastening terminal and suspension clamps.
- Tension and suspension units for fastening to the vertical angle of support belt.
- Loop clamps for metal supports and poles.

FUSION SPLICERS FOR OPTICAL FIBERS

FUJIKURA FSM-80S

The model FUJIKURA FSM-80S replaced the previous model FUJIKURA FSM-60S which is the leader of sales on the Russian market. FUJIKURA FSM-80S as well as FUJIKURA FSM-60S makes alignment on fiber core (method PAS). They have the following advantages:



- Protection against dust, moisture, vibrations, and shocks.
- Automatic windproof cover and automatic heater shorten fusion time.
- Innovative design of the case for fast preparation for operation.
- Bigger resource of electrodes – 3000 fusion connections.
- Powerful Li-ion battery for long independent operation.
- Big antiglare color LCD monitor with high resolution.
- User's Guide in the menu of the fusion splicer.

SUMITOMO TYPE-71C with the touch screen

SUMITOMO TYPE-71 is a fusion splicer designed for superfast connection of optical cables in town and long-distance communication networks. The new model differs from the previous one by weight decreased by 43% and improved technical characteristics.



- Superfast execution of working operations (min. time of a fusion cycle is 7 seconds, min. time of thermal setting is 28 seconds).
- Robust and reliable design (IP 52, the instrument preserves integrity if fallen from a height of up to 0.76 m);
- Comfortable control through the touch screen.
- Training video is available;
- The fusion splicer SUMITOMO TYPE-71 is equipped with universal clips for optical fiber which enables to make fusion of optical fiber of any type in any buffer. The instrument is equipped with a patented system of installation and quick change of the position of fiber holders which enables comfortable and effective operation regardless the position of the touch monitor.

FURUKAWA FITEL S178A V2

FURUKAWA company has started to manufacture portable fusion splicers Fitel S178A (V2) modernized to version 2 (with alignment to fiber center).



- Charging of batteries is done automatically (if the splicer is connected to A.C. network) by the installed charging device, even during operation.
- Modernized LCD allows to have various variants of reflection of optical fibers along axis X / Y.
- The program AUTO is installed in the menu of the model S178 for splicing all types of single-mode fibers.
- An improved powerful heater makes thermal setting easier.
- Qualitative graphic interface makes the process of observation easier.
- The lamp in the cover of the instrument lights the region of V-shaped grooves well which is very comfortable under low-light-level condition.
- Simplified editing of programs of fusion and thermal setting.
- A new soft case for the instrument with standard set.

FUJIKURA CT-30A

The device made by Fujikura differs from previous models by the following:

The angle between the lever and the base of the cleaver is increased to make laying of fibers into grooves and installation of the removable holder with fibers more comfortable; the area of the base was increased to make the cleaver more steady;

the model is in complete with plate with two grooves to lay a single optical fiber in 250 or 900 μm protective cover.;

Is designed to work with fusion splicers for fiber ribbons FSM-60R, 18R and 11R. Instead of plate for laying fiber into cleavers removable fiber holders of splicer are put into the cleaver.

A standard set of cleavers CT-30 and CT-39A includes containers of big and small capacity to collect remains of cleaved fibers.



- Min. of operations during cleaving.
- The biggest resource of 48 000 chippings without the replacement of the blade.
- A big angle between the lever and the base of the cleaver for more comfortable fiber laying.
- The mechanism for automatic blade shifting.
- A possibility to handle fiber ribbons.

FURUKAWA FITEL S-325A

Compact-size precision cleaver Fitel S-325A enables fast and clear cut. Fiber is easily put into the cleaver with one knob. Due to containers available in the set fiber remains will not get to your clothes. It is possible to work with the cleaver on the table or simply holding it by hand: the size of the cleaver is small and its ergonomics is very high.



- Fiber type: all types. Cladding diameter is 0.125 mm.
- Coating diameter is 0.25 mm and 0.9 mm for a single fiber, 0.3-0.4 mm for fiber ribbons.
- Cleaved length – Single fiber: fixed length is 10&16 mm, variable length is 3-20 mm.
- Fiber ribbon: 10 mm (fixed length).
- Size/weight: 93 x 68 x 52 mm, 330 g.

SUMITOMO FC-6S

In a new development of Sumitomo – FC-6S the main attention was paid to comfortable work of the operator. It is only necessary to fix fiber in clamps and press on the flap cover to do high-quality cleaving.

The resource of FC-6S is the biggest in the world 36 000 cleavings (with one blade) and 72 000 cleavings (if a spare blade is used). A turn of the blade is done very simply, as due to V-shaped design of the holder it is not necessary to select the height of the blade.



- Fiber type: all types.
- Cladding diameter: 0.125 mm.
- Coating diameter: 0.25 mm and 0.9 mm for a single fiber.
- The length of fiber cleaned from coating, mm: 9 - 16 (0.25) 10 - 16 (0.25)
- Angle of cleaving: 0.50 (typical)
- Resource (the blades are replaceable): 36 000 fibers.
- Size/weight - 63 x 65 x 63 mm, 420 g.

OPTICAL FIBER COUPLINGS FOSC-400

Couplings FOSC-400 are designed for splicing construction lengths and/or branching fiber optical cables laid in cable channels, collectors, tunnels, soils of all categories (except rocky soils and permafrost soils), cables suspended on power line supports, contact networks, and automatic block system of railways.

Closure	Number of fiber connections			Number of cable elements		
	Single fusion	Single mechanical connection	Ribbon consisting of 4 fibers	Tubes	Optical fibers loosely laid	Ribbon consisting of 12 fibers
FOSC 400 A4	48/96	24(4)	24	8	96	6
FOSC 400 A8	96	48	288	6	96	24
FOSC 400 B2, B4	96/144*	96/144*	288	6	96	24
FOSC 400 D5	768	768	1152	18	96	72

* Capacity of the coupling can be increased to 144 splicings if two additional cassettes are put instead of the trough for keeping spare transit modules (fibers).

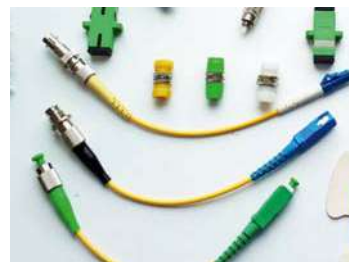
Additional cassettes can be installed at the time of manufacturing the coupling!

It is impossible to install additional cassettes into an assembled coupling!



OPTICAL CORDS, PIGTAILS, CABLE KITS

- Optical cords (patch-cords) with FC, SC, ST, L; with sockets, single-mode and multi-mode versions
- Optical cords (pigtails) with FC, SC, ST, L; with sockets, single-mode and multi-mode versions.
- Optical adapters FC, SC, ST, LC; single-mode and multi-mode versions.
- Cable sets with different kinds of optical cables: OKPM, OKPTS, OKKM, OKKTS, OKTM, OKTTS, OKPP, OKR, OKD, OKV, OKS, OKDP and others.
- Sleeves KDZS-60, KDZS-40, AG-61S, AG-45S to protect places of fiber fusion.



MEASURING INSTRUMENTS

Measuring platform EXFO FTB-1 – a new handy modular platform is designed for fast and effective testing of optical networks.

Compact measuring platform EXFO FTB-200 v2 – a new version of the compact measuring platform FTB-200 for measuring and testing Ethernet and SONET/SDH.

Reflectometer for access networks EXFO AXS-100/ AXS-110 – for finding faults in operating PON networks. There are several configurations with various wavelength and wide selection of additional accessories. It can be used for testing optical networks terminals (ONT), end terminals or distribution panels to evaluate FTTH of optical fibers, finding faults and their location.

Multi-purpose device for measuring power EXFO FPM-600 – it has a great dynamic range and allows to measure power up to 26 dBm, power level up to 38 dBm, testing of passive optical networks (PON) at three wavelengths - 1310, 1490 и 1550 nm which are used in networks FTTH and FTTP according to ITU-TG983.3.

Multi-purpose optical tester EXFO FOT-300 – it is designed for measuring power and optical losses in communication fiber optic networks. The tester includes single-mode and multi-mode optical source (output port) and optical power gage (input port).

Optical power reflectometer Anritsu MT9083A/B/C ACCESS Maste™ – it makes possible to build-up fiber optic networks including PON, to service networks FTTH, CATV, LAN, optical access networks and and optical distribution networks.



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