

Fiber optic duct and buried cables: security with FiberWay

A break in a fiber optic cable network can result in substantial costs for the operator. To avoid this, cables must meet high mechanical requirements and be resistant to environmental factors such as extreme temperatures.

For this reason, our FiberWay duct and buried fiber optic cables are designed to be especially robust. When the appropriate cable is selected and it is installed correctly, the cable will retain its optimal characteristics even when pulled into ducts or buried directly.

Fiber identification: UV coloring

All the optical fibers are colored with UV-cured acrylate color. This is a state of art coloring that guarantees a uniformly smooth surface. For identification of fibers in one tube a scheme of twelve colors is used:

1: blue	7: red
2: orange	8: black
3: green	9: yellow
4: brown	10: violet
5: gray	11: pink
6: white	12: turquoise

If there are more than 12 fibers in a tube, we use a fiber bundle technique, in which 12 fibers are held together with a colored binding yarn.

We can also offer cables with fiber ribbons. A special coating is used to combine up to 24 fibers to form a fiber ribbon.

Tube identification:

The standard system for tube identification in stranded loose tube cables is the "pilot-directional" one. The pilot tube is red, the directional one green and all other tubes are natural colored. Other tube identification systems according to prevailing national standards may be obtained on request.

Cable design: meeting every requirement

We distinguish three basic design types:

- Stranded tube cables: cables with stranded loose buffer tubes around a central metallic or non-metallic (dielectric) strength member
- Central tube cables: cables with a central loose buffer tube and strength elements partly embedded into the sheath
- Slotted core cables: cables which have a central member with longitudinal slots within which the fibers are positioned

In each case, the optical fibers which lie in the loose tubes or slots, are not under any tension.

High degree of water protection

Should water penetrate through a damaged point in the sheath, special fillings prevent the water from migrating along the cable. This is achieved by the use of a gel-type filling compound, or alternatively by a dry swellable element. The advantage of this so-called "dry" cable is its greater ease of installation. For additional protection against moisture, we can offer cables with a laminated aluminum sheath.

Outer protection

Here we use an outer jacket of polyethylene (PE) which is resistant to stress cracking and UV radiation. Where there are special requirements in buildings, with respect to flame retardants and halogens, we use our specially-developed FRNC (Flame Retardant, Non-Corrosive) material.

Non-metallic: the advantage

Our non-metallic (dielectric) cables offer you the following advantages:

- No problems with grounding or potential equalization
- No lightning protection measures are required
- Buildings can be electrically isolated

Rodent protection: resistance to damage

Damage due to rodents can be a problem mainly with direct buried cables, but also when they are laid in shafts and duct systems. Protection against rodent damage can be offered in the form of either non-metallic armoring and protective jackets or metallic armoring. Non-metallic protection has the advantages of a dielectric cable as described above.

Non-metallic armoring includes laminated glass-fiber yarns, which serve also as strength elements. With these, the cable remains flexible, and its diameter increases insignificantly compared to an unarmored cable.

Greater non-metallic protection is offered by a jacket of polyamide, the hardest plastic used for sheathing cables. However, it makes the cable slightly larger and less flexible than when glass-fiber yarns are used for the armoring.

Metallic armoring is considered the most effective protection against rodent damage.

Metallic armoring: optimal security for every purpose

Where high mechanical loads are involved, as is the case in direct buried installations, an additional metallic armoring is recommended. For our standard products we offer corrugated steel tape under the outer jacket. A special coating is used to bond the outer jacket to the steel tape. Where the mechanical loads are exceptionally high, a further inner jacket can be inserted underneath the steel tape.

Our cables are all identified in accordance with the VDE standards (see bookmark). A summary of the type abbreviations together with the color codes will be found on the attached bookmark.

Identification of fiber optic duct and buried cables

Outer jacket marking

As standard, every cable jacket is printed with distance markings and at meter intervals the labeling (see picture to the right).



Delivery lengths

Standard delivery lengths are available in multiples of 1000 m.

Standard cable attenuation values

other attenuation values can be supplied on request

	850 nm	1310 nm	1550 nm
Optical fiber	Maximum attenuation in dB/km		
Corning SMF 28	–	0.38	0.24
Corning LEAF™	–	–	0.27
MetroCor	–	0.36	0.22
Multimode fiber (core diameter 50 µm/62.5 µm)	2.5/3.1	0.7/0.8	–
	Average attenuation in dB/km		
Corning SMF 28	–	0.37	0.23
Corning LEAF™	–	–	0.26
MetroCor	–	0.35	0.21
	Bandwidth in MHz km		
Multimode fiber (core diameter 50 µm/62.5 µm)	400/200	1200/600	–

Measured in accordance with DIN EN 187000, IEC 60794-1 respectively.
The requirements of DIN EN 50173 and ISO/IEC 11801 are met or exceeded.

FiberWay: two product families

Fiber optic cables need to exhibit a wide range of characteristics. Apart from the general design features already described, they must also exhibit suitable values for tensile strength,

temperature cycling and bending characteristics, together with impact and crush resistance, appropriate for the application and environmental conditions. Our FiberWay standard product families cover the entire range of applications in a logical way.

Stranded and central loose tube designs:

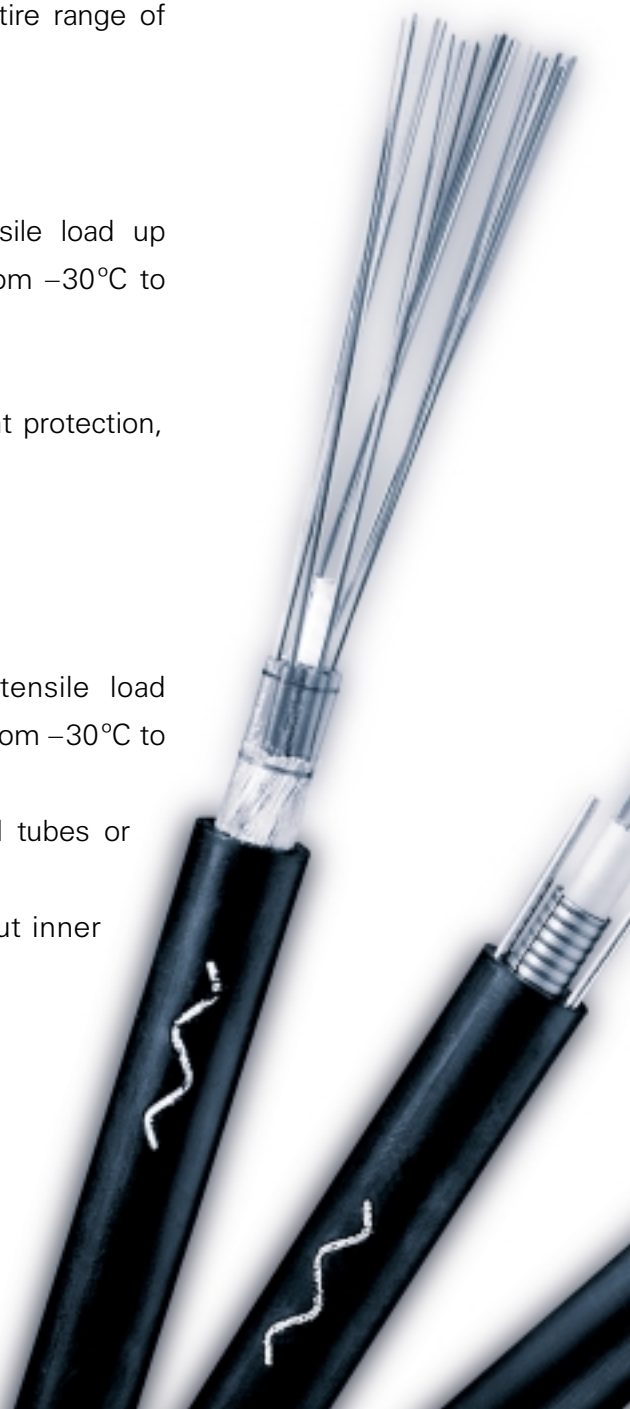
- For all standard applications of cable laying with a tensile load up to 2700 N and environments with a temperature range from -30°C to $+70^{\circ}\text{C}$.
- Cable design with loose fibers in stranded or central tubes.
- Variations: non-metallic, moisture barrier, non-metallic rodent protection, metallic armoring with or without inner jacket

Further details see page 22

Ribbon designs:

- For all standard applications of cable laying with a tensile load up to 2700 N and environments with a temperature range from -30°C to $+70^{\circ}\text{C}$.
- Cable design with fiber ribbons in stranded tubes, central tubes or slotted cores.
- Variations: non-metallic, metallic armoring with or without inner jacket

Further details see page 40



Although our FiberWay product families are designed for a wide range of applications, sometimes there is a need to find solutions for special applications. In doing so, we can call on the appropriate expertise.

**We can
do it**

Furthermore our sophisticated manufacturing technology and tailor-made machines enable us to meet your particular specifications.

In the context of specific projects, we have implemented cables with particularly demanding requirements in relation to tensile strength of 25000 N and more, as well as for extreme climatic conditions with a temperature range of -60°C to $+70^{\circ}\text{C}$.

Our designers can also cater for special values for crush and impact resistance or bending characteristics.



FiberWay

Stranded and loose tube design

These designs provide a universal family of stranded tube cables up to 432 fibers and central tube cables up to 96 fibers. With a tensile strength of 2700 N, these are suitable for all methods of cable laying. Their temperature range of -30°C to +70°C also covers climatic conditions throughout the world.

The cables are tested in accordance with IEC 60793-1, 60794-1-2.

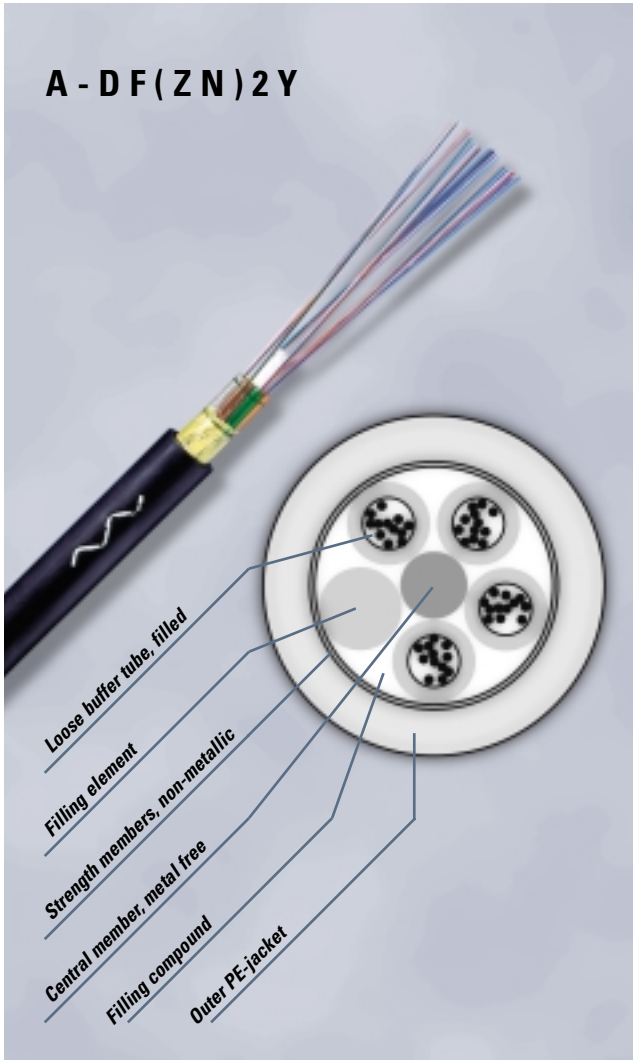
Summary of the selection criteria for stranded and central loose tube design cables

	Duct cable	page	Duct cable with moisture barrier	page	Duct cable with dielectric rodent protection	page
Stranded tube design						
dielectric central strength member (GRP), filling compound	A-DF(ZN)2Y	23	A-DF(ZN)(L)2Y	27	A-DF(ZN)2Y4Y	30
dielectric central strength member (GRP), dry core	A-DQ(ZN)2Y	24	A-DQ(ZN)(L)2Y	28	A-DQ(ZN)2Y4Y	31
metallic central strength member (steel wire), filling compound	A-DSF2Y	25	A-DSF(L)2Y	29	A-DQ(BN)2Y	32
Central tube design	A-D(ZM)2Y	26				

	Buried cable	page	Buried cable with inner PE-jacket	page
Stranded tube design				
dielectric central strength member (GRP), filling compound	A-DF(ZN)(SR)2Y	33	A-DF(ZN)2Y(SR)2Y	37
dielectric central strength member (GRP), dry core	A-DQ(ZN)(SR)2Y	34	A-DQ(ZN)2Y(SR)2Y	38
metallic central strength member (steel wire), filling compound	A-DSF(SR)2Y	35	A-DSF2Y(SR)2Y	39
Central tube design	A-D(ZM)(SR)2Y	36		

Fiber optic duct cable

stranded tube design, non-metallic



A - DF(ZN)2Y

Applications

- Pulling into duct systems
- Laying in concrete channels
- Laying on cable racks

Special features

- Single-layer stranded construction (up to 144 fibers)
- Double-layer stranded construction (> 144 fibers, up to 288 fibers)
- Non-metallic construction
- No problems with grounding or potential equalization
- Particularly light, thin and robust cables

Temperature range

- Laying and installation -5°C to 50°C
- Operation -30°C to 70°C
- Transport and storage -40°C to 70°C

Test procedures to IEC 60793-1, 60794-1-2

- Tensile strength
- Impact resistance
- Crush resistance
- Bending characteristics
- Temperature cycling
- Water penetration

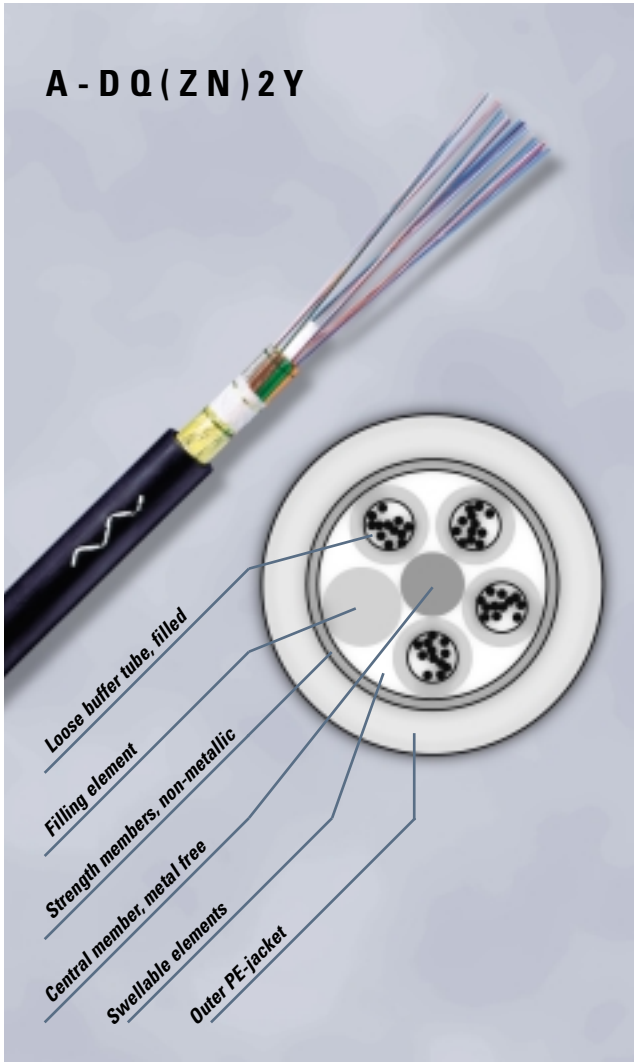
Ordering data

Type designation	No. of fibers	Fibers per loose buffer tube	No. of loose buffer tubes	No. of stranding elements	Outer Ø (mm)	Net weight (kg/km)	Max. tensile load during install. (N)	Min. bending radius during install. (mm)
A-DF(ZN)2Y 2x6	12	6	2	5	9.2	65	2700	161
A-DF(ZN)2Y 3x6	18	6	3	5	9.2	65	2700	161
A-DF(ZN)2Y 4x6	24	6	4	5	9.2	65	2700	161
A-DF(ZN)2Y 3x12	36	12	3	5	10.5	84	2700	184
A-DF(ZN)2Y 4x12	48	12	4	5	10.5	84	2700	184
A-DF(ZN)2Y 5x12	60	12	5	5	10.5	84	2700	184
A-DF(ZN)2Y 6x12	72	12	6	6	11.2	97	2700	196
A-DF(ZN)2Y 8x12	96	12	8	8	12.9	127	2700	226
A-DF(ZN)2Y 12x12	144	12	12	12	16.2	198	2700	284
A-DF(ZN)2Y 16x12	192	12	16	5+11	15.4	186	2700	270
A-DF(ZN)2Y 24x12	288	12	24	9+15	17.8	266	2700	312

Other attenuation values, fiber counts and cable designs on request.

Fiber optic duct cable

stranded tube design, non-metallic, dry core



Applications

- Pulling into duct systems
- Laying in concrete channels
- Laying on cable racks

Special features

- Single-layer stranded construction (up to 144 fibers)
- Double-layer stranded construction (> 144 fibers, up to 288 fibers)
- Non-metallic construction
- No problems with grounding or potential equalization
- Dry core construction
- Particularly light, thin and robust cables

Temperature range

- Laying and installation -5°C to 50°C
- Operation -30°C to 70°C
- Transport and storage -40°C to 70°C

Test procedures to IEC 60793-1, 60794-1-2

- Tensile strength
- Impact resistance
- Crush resistance
- Bending characteristics
- Temperature cycling
- Water penetration

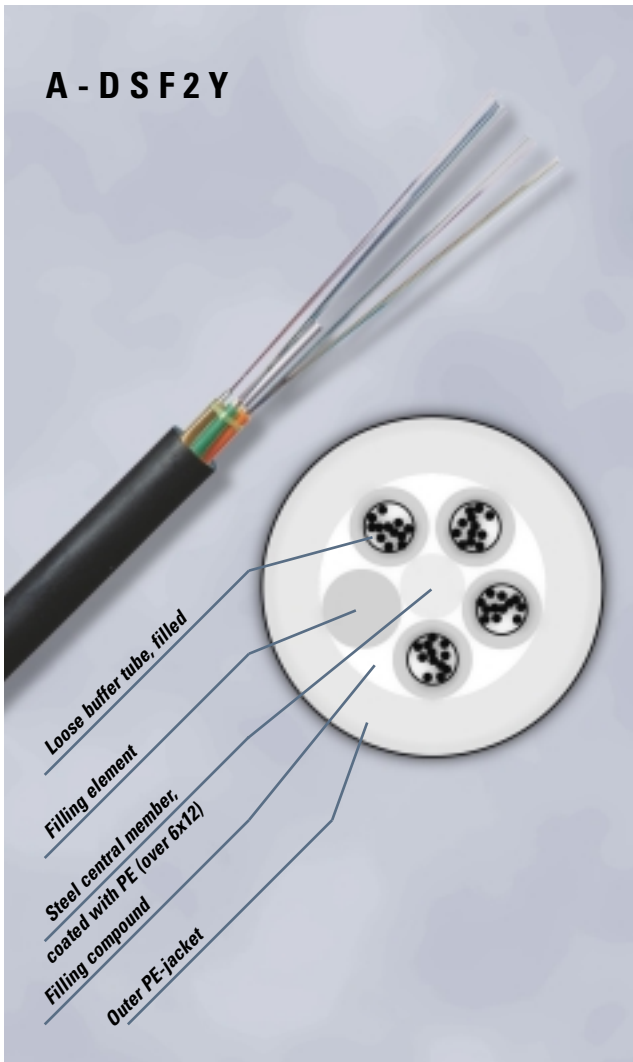
Ordering data

Type designation	No. of fibers	Fibers per loose buffer tube	No. of loose buffer tubes	No. of stranding elements	Outer Ø (mm)	Net weight (kg/km)	Max. tensile load during install. (N)	Min. bending radius during install. (mm)
A-DQ(ZN)2Y 2x6	12	6	2	5	9.3	63	2700	163
A-DQ(ZN)2Y 3x6	18	6	3	5	9.3	63	2700	163
A-DQ(ZN)2Y 4x6	24	6	4	5	9.3	63	2700	163
A-DQ(ZN)2Y 3x12	36	12	3	5	10.5	80	2700	184
A-DQ(ZN)2Y 4x12	48	12	4	5	10.5	80	2700	184
A-DQ(ZN)2Y 5x12	60	12	5	5	10.5	80	2700	184
A-DQ(ZN)2Y 6x12	72	12	6	6	11.6	97	2700	203
A-DQ(ZN)2Y 8x12	96	12	8	8	13.3	125	2700	233
A-DQ(ZN)2Y 12x12	144	12	12	12	16.6	193	2700	291
A-DQ(ZN)2Y 16x12	192	12	16	5+11	16.2	171	2700	284
A-DQ(ZN)2Y 24x12	288	12	24	9+15	18.6	245	2700	326

Other attenuation values, fiber counts and cable designs on request.

Fiber optic duct cable

stranded tube design, metallic central member



Applications

- Pulling into duct systems
- Laying in concrete channels
- Laying on cable racks

Special features

- Single-layer stranded construction (up to 144 fibers)
- Double-layer stranded construction (> 144 fibers, up to 288 fibers)
- Particularly light, thin and robust cables

Temperature range

- Laying and installation -5°C to 50°C
- Operation -30°C to 70°C
- Transport and storage -40°C to 70°C

Test procedures to IEC 60793-1, 60794-1-2

- Tensile strength
- Impact resistance
- Crush resistance
- Bending characteristics
- Temperature cycling
- Water penetration

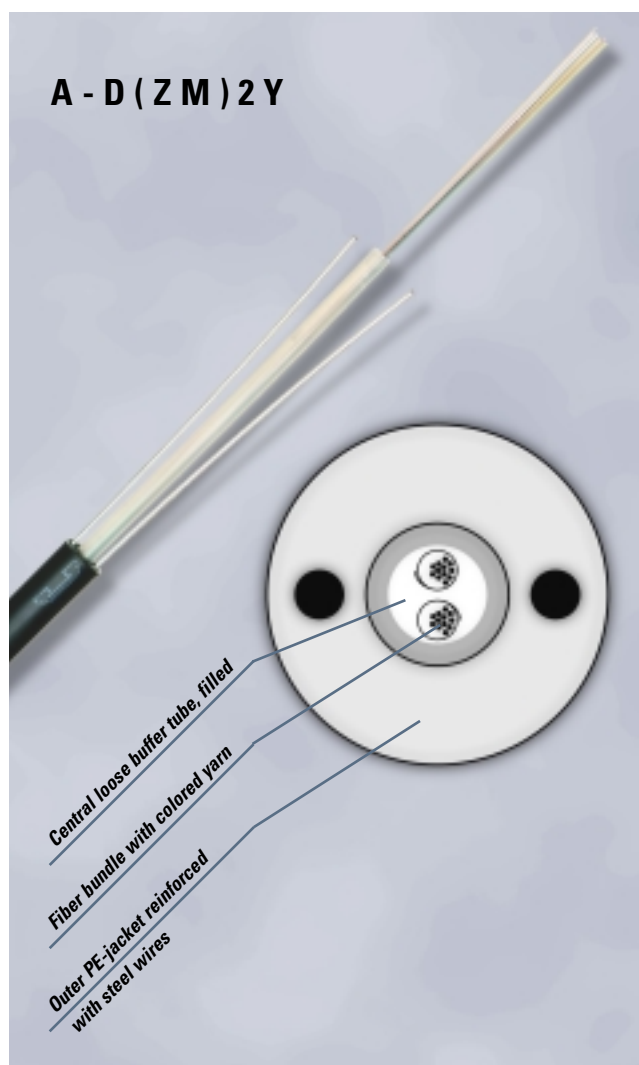
Ordering data

Type designation	No. of fibers	Fibers per loose buffer tube	No. of loose buffer tubes	No. of stranding elements	Outer Ø (mm)	Net weight (kg/km)	Max. tensile load during install. (N)	Min. bending radius during install. (mm)
A-DSF2Y 2x6	12	6	2	5	9.2	74	2700	161
A-DSF2Y 3x6	18	6	3	5	9.2	74	2700	161
A-DSF2Y 4x6	24	6	4	5	9.2	74	2700	161
A-DSF2Y 3x12	36	12	3	5	10.1	94	2700	177
A-DSF2Y 4x12	48	12	4	5	10.1	94	2700	177
A-DSF2Y 5x12	60	12	5	5	10.1	94	2700	177
A-DSF2Y 6x12	72	12	6	6	10.6	107	2700	186
A-DSF2Y 8x12	96	12	8	8	12.3	136	2700	216
A-DSF2Y 12x12	144	12	12	12	15.6	211	2700	273
A-DSF2Y 16x12	192	12	16	5+11	14.9	198	2700	261
A-DSF2Y 24x12	288	12	24	9+15	17.9	280	2700	314

Other attenuation values, fiber counts and cable designs on request.

Fiber optic duct cable

central tube design



Applications

- Pulling into duct systems
- Laying in concrete channels
- Laying on cable racks

Special features

- Central tube construction
- Particularly light, thin and robust cables

Temperature range

- Laying and installation –5°C to 50°C
- Operation –30°C to 70°C
- Transport and storage –40°C to 70°C

Test procedures to IEC 60793-1 and 60794-1-2

- Tensile strength
- Impact resistance
- Crush resistance
- Bending characteristics
- Temperature cycling
- Water penetration

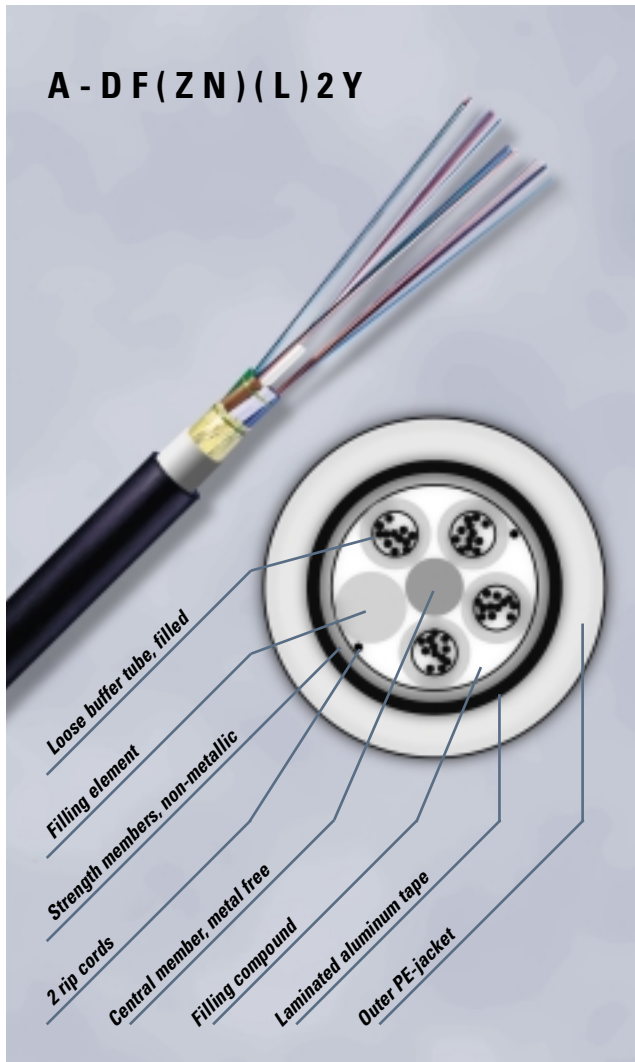
Ordering data

Type designation	No. of fibers	Fibers per loose buffer tube	No. of loose buffer tubes	No. of stranding elements	Outer Ø (mm)	Net weight (kg/km)	Max. tensile load during install. (N)	Min. bending radius during install. (mm)
A-D(ZM)2Y 1x8	8	8	1	4.2	10.2	104	2700	180
A-D(ZM)2Y 1x10	10	10	1	4.2	10.2	104	2700	180
A-D(ZM)2Y 1x12	12	12	1	4.2	10.2	104	2700	180
A-D(ZM)2Y 1x16	16	8	2	4.2	10.2	104	2700	180
A-D(ZM)2Y 1x20	20	10	2	4.2	10.2	104	2700	180
A-D(ZM)2Y 1x24	24	12	2	4.2	10.2	104	2700	180
A-D(ZM)2Y 1x36	36	12	3	6	12.0	135	2700	215
A-D(ZM)2Y 1x48	48	12	4	6	12.0	135	2700	215
A-D(ZM)2Y 1x96	96	12	8	8	14.0	174	2700	270

Other attenuation values, fiber counts and cable designs on request.

Fiber optic duct cable

stranded tube design, non-metallic central member, moisture barrier



Applications

- Pulling into duct systems
- Laying in concrete channels
- Laying on cable racks

Special features

- Single-layer stranded construction (up to 144 fibers)
- Double-layer stranded construction (> 144 fibers, up to 288 fibers)
- Laminated aluminum tape as additional moisture barrier
- Light, thin and robust cables

Temperature range

- Laying and installation -5°C to 50°C
- Operation -30°C to 70°C
- Transport and storage -40°C to 70°C

Test procedures to IEC 60793-1, 60794-1-2

- Tensile strength
- Impact resistance
- Crush resistance
- Bending characteristics
- Temperature cycling
- Water penetration

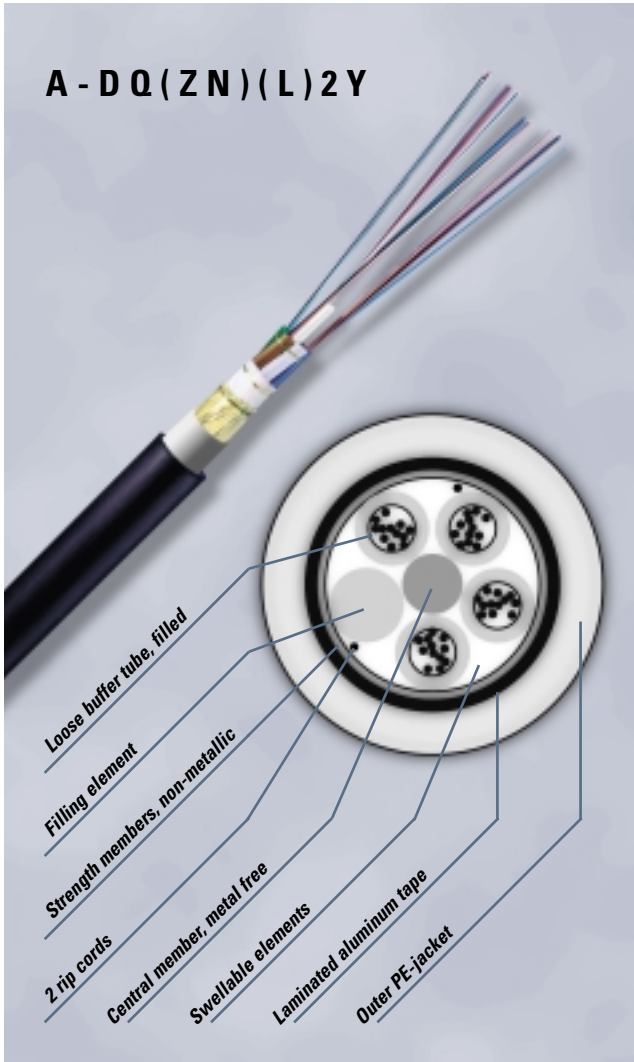
Ordering data

Type designation	No. of fibers	Fibers per loose buffer tube	No. of loose buffer tubes	No. of stranding elements	Outer Ø (mm)	Net weight (kg/km)	Max. tensile load during install. (N)	Min. bending radius during install. (mm)
A-DF(ZN)(L)2Y 2x6	12	6	2	5	10.3	87	2700	181
A-DF(ZN)(L)2Y 3x6	18	6	3	5	10.3	87	2700	181
A-DF(ZN)(L)2Y 4x6	24	6	4	5	10.3	87	2700	181
A-DF(ZN)(L)2Y 3x12	36	12	3	5	11.6	109	2700	203
A-DF(ZN)(L)2Y 4x12	48	12	4	5	11.6	109	2700	203
A-DF(ZN)(L)2Y 5x12	60	12	5	5	11.6	109	2700	203
A-DF(ZN)(L)2Y 6x12	72	12	6	6	12.3	123	2700	216
A-DF(ZN)(L)2Y 8x12	96	12	8	8	14.0	158	2700	245
A-DF(ZN)(L)2Y 12x12	144	12	12	12	17.3	236	2700	303
A-DF(ZN)(L)2Y 16x12	192	12	16	5+11	16.5	222	2700	289
A-DF(ZN)(L)2Y 24x12	288	12	24	9+15	18.9	284	2700	331

Other attenuation values, fiber counts and cable designs on request.

Fiber optic duct cable

stranded tube design, non-metallic central member,
dry core, moisture barrier



Applications

- Pulling into duct systems
- Laying in concrete channels
- Laying on cable racks

Special features

- Single-layer stranded construction (up to 144 fibers)
- Double-layer stranded construction (> 144 fibers, up to 288 fibers)
- Laminated aluminum tape as additional moisture barrier
- Dry core construction
- Light, thin and robust cables

Temperature range

- Laying and installation -5°C to 50°C
- Operation -30°C to 70°C
- Transport and storage -40°C to 70°C

Test procedures to IEC 60793-1, 60794-1-2

- Tensile strength
- Impact resistance
- Crush resistance
- Bending characteristics
- Temperature cycling
- Water penetration

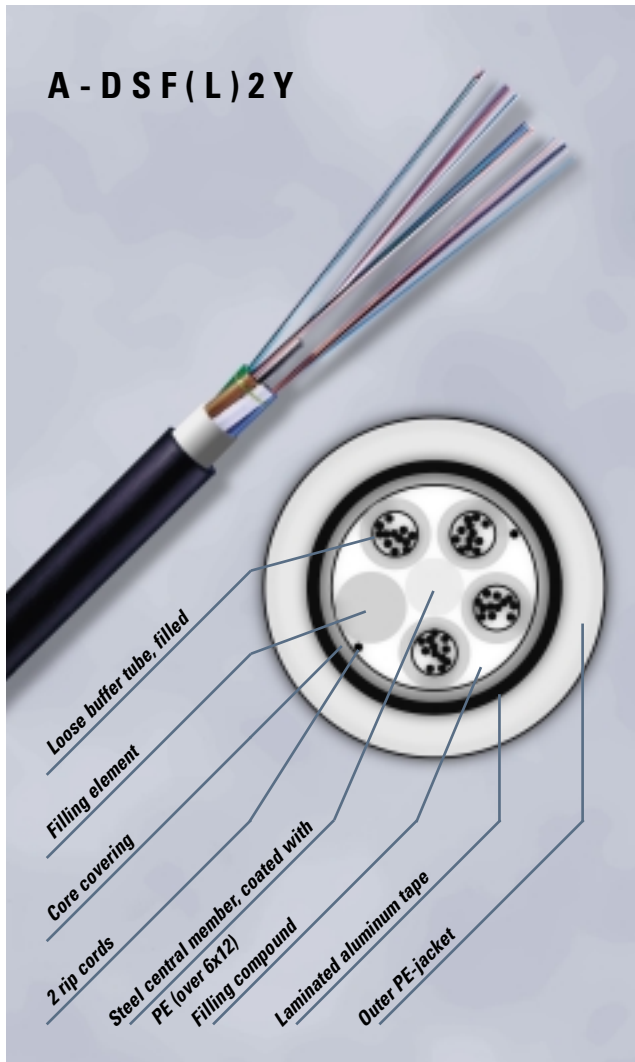
Ordering data

Type designation	No. of fibers	Fibers per loose buffer tube	No. of loose buffer tubes	No. of stranding elements	Outer Ø (mm)	Net weight (kg/km)	Max. tensile load during install. (N)	Min. bending radius during install. (mm)
A-DQ(ZN)(L)2Y 2x6	12	6	2	5	10.7	90	2700	188
A-DQ(ZN)(L)2Y 3x6	18	6	3	5	10.7	90	2700	188
A-DQ(ZN)(L)2Y 4x6	24	6	4	5	10.7	90	2700	188
A-DQ(ZN)(L)2Y 3x12	36	12	3	5	12.0	111	2700	210
A-DQ(ZN)(L)2Y 4x12	48	12	4	5	12.0	111	2700	210
A-DQ(ZN)(L)2Y 5x12	60	12	5	5	12.0	111	2700	210
A-DQ(ZN)(L)2Y 6x12	72	12	6	6	12.7	125	2700	223
A-DQ(ZN)(L)2Y 8x12	96	12	8	8	14.4	158	2700	252
A-DQ(ZN)(L)2Y 12x12	144	12	12	12	17.7	232	2700	310
A-DQ(ZN)(L)2Y 16x12	192	12	16	5+11	17.3	175	2700	303
A-DQ(ZN)(L)2Y 24x12	288	12	24	9+15	19.7	249	2700	345

Other attenuation values, fiber counts and cable designs on request.

Fiber optic duct cable

stranded tube design, metallic central member, moisture barrier



Applications

- Pulling into duct systems
- Laying in concrete channels
- Laying on cable racks

Special features

- Single-layer stranded construction (up to 144 fibers)
- Double-layer stranded construction (> 144 fibers, up to 288 fibers)
- Laminated aluminum tape as additional moisture barrier
- Light, thin and robust cables

Temperature range

- Laying and installation -5°C to 50°C
- Operation -30°C to 70°C
- Transport and storage -40°C to 70°C

Test procedures to IEC 60793-1, 60794-1-2

- Tensile strength
- Impact resistance
- Crush resistance
- Bending characteristics
- Temperature cycling
- Water penetration

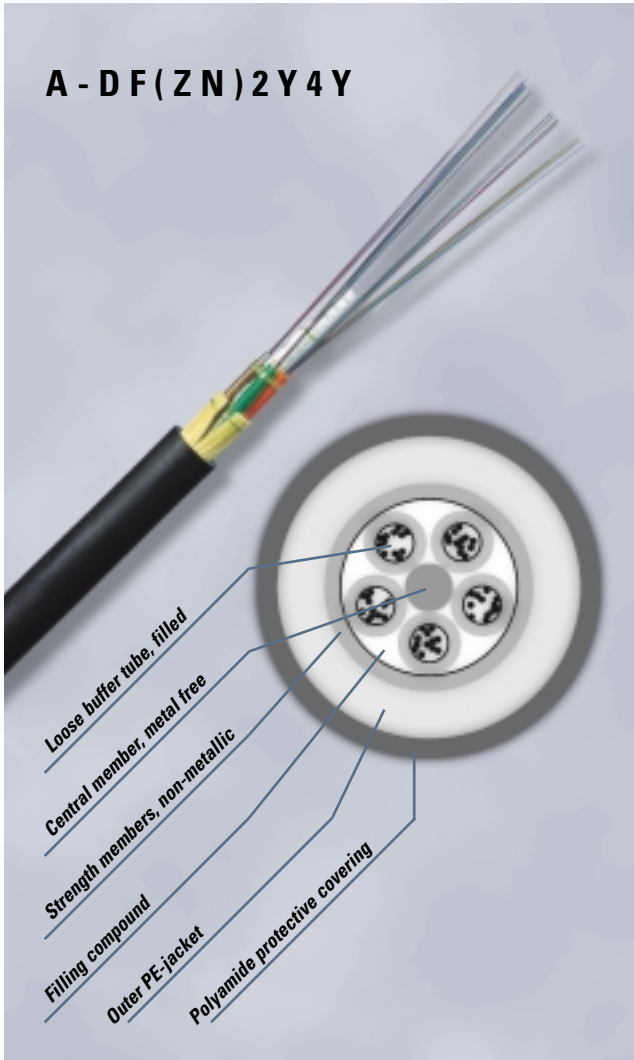
Ordering data

Type designation	No. of fibers	Fibers per loose buffer tube	No. of loose buffer tubes	No. of stranding elements	Outer Ø (mm)	Net weight (kg/km)	Max. tensile load during install. (N)	Min. bending radius during install. (mm)
A-DSF(L)2Y 2x6	12	6	2	5	10.9	105	2700	191
A-DSF(L)2Y 3x6	18	6	3	5	10.9	105	2700	191
A-DSF(L)2Y 4x6	24	6	4	5	10.9	105	2700	191
A-DSF(L)2Y 3x12	36	12	3	5	11.6	127	2700	203
A-DSF(L)2Y 4x12	48	12	4	5	11.6	127	2700	203
A-DSF(L)2Y 5x12	60	12	5	5	11.6	127	2700	203
A-DSF(L)2Y 6x12	72	12	6	6	12.3	140	2700	216
A-DSF(L)2Y 8x12	96	12	8	8	14.0	175	2700	245
A-DSF(L)2Y 12x12	144	12	12	12	17.3	255	2700	303
A-DSF(L)2Y 16x12	192	12	16	5+11	16.0	235	2700	256
A-DSF(L)2Y 24x12	288	12	24	9+15	19.0	323	2700	333

Other attenuation values, fiber counts and cable designs on request.

Fiber optic duct cable

stranded tube design, non-metallic, rodent protection, oil-resistant



Applications

- Pulling into duct systems
- Laying in concrete channels
- Laying on cable racks
- In areas with rodents
- Direct buried in sand beds

Special features

- Single-layer stranded construction (up to 144 fibers)
- Double-layer stranded construction (> 144 fibers, up to 288 fibers)
- Non-metallic construction
- No problems with grounding or potential equalization
- Rodent protection provided by Polyamide jacket
- Oil-resistant, secure against termites
- Light, thin and robust cables

Temperature range

- Laying and installation -5°C to 50°C
- Operation -30°C to 70°C
- Transport and storage -40°C to 70°C

Test procedures to IEC 60793-1, 60794-1-2

- Tensile strength
- Impact resistance
- Crush resistance
- Bending characteristics
- Temperature cycling
- Water penetration

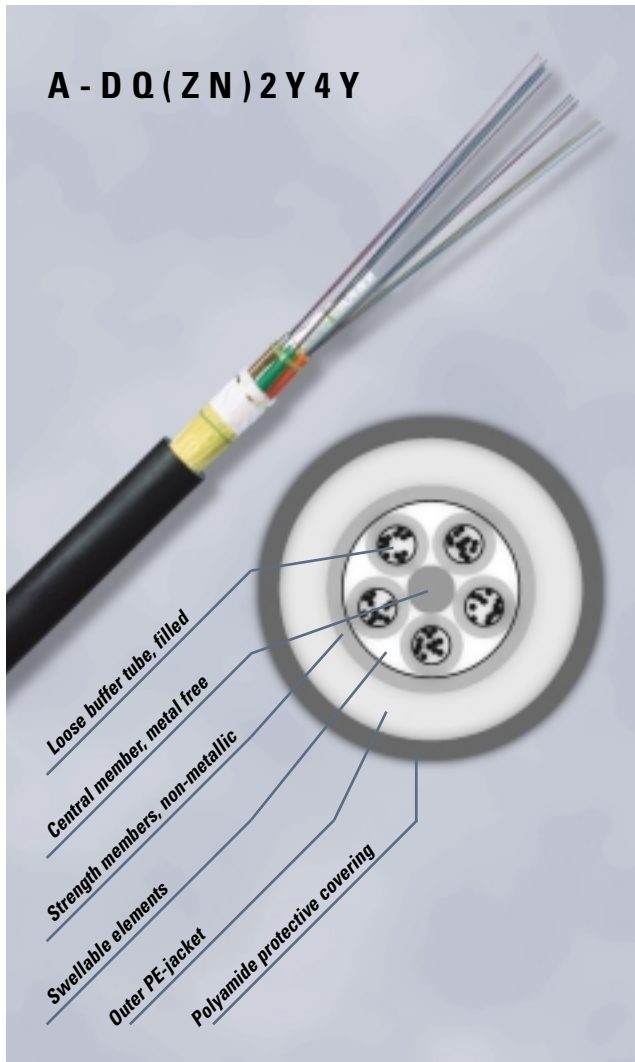
Ordering data

Type designation	No. of fibers	Fibers per loose buffer tube	No. of loose buffer tubes	No. of stranding elements	Outer Ø (mm)	Net weight (kg/km)	Max. tensile load during install. (N)	Min. bending radius during install. (mm)
A-DF(ZN)2Y4Y 2x6	12	6	2	5	11.4	89	2700	200
A-DF(ZN)2Y4Y 3x6	18	6	3	5	11.4	89	2700	200
A-DF(ZN)2Y4Y 4x6	24	6	4	5	11.4	89	2700	200
A-DF(ZN)2Y4Y 3x12	36	12	3	5	12.7	113	2700	223
A-DF(ZN)2Y4Y 4x12	48	12	4	5	12.7	113	2700	223
A-DF(ZN)2Y4Y 5x12	60	12	5	5	12.7	113	2700	223
A-DF(ZN)2Y4Y 6x12	72	12	6	6	13.4	127	2700	235
A-DF(ZN)2Y4Y 8x12	96	12	8	8	15.1	161	2700	265
A-DF(ZN)2Y4Y 12x12	144	12	12	12	18.4	241	2700	322
A-DF(ZN)2Y4Y 16x12	192	12	16	5+11	17.4	236	2700	305
A-DF(ZN)2Y4Y 24x12	288	12	24	9+15	19.8	324	2700	345

Other attenuation values, fiber counts and cable designs on request.

Fiber optic duct cable

stranded tube design, non-metallic, dry core, rodent protection, oil-resistant



A - D Q (Z N) 2 Y 4 Y

Applications

- Pulling into duct systems
- Laying in concrete channels
- Laying on cable racks
- In areas with rodents
- Direct buried in sand beds

Special features

- Single-layer stranded construction (up to 144 fibers)
- Double-layer stranded construction (> 144 fibers, up to 288 fibers)
- Non-metallic construction
- No problems with grounding or potential equalization
- Dry core construction
- Rodent protection provided by Polyamide jacket
- Oil-resistant, secure against termites
- Light, thin and robust cables

Temperature range

- Laying and installation -5°C to 50°C
- Operation -30°C to 70°C
- Transport and storage -40°C to 70°C

Test procedures to IEC 60793-1, 60794-1-2

- Tensile strength
- Impact resistance
- Crush resistance
- Bending characteristics
- Temperature cycling
- Water penetration

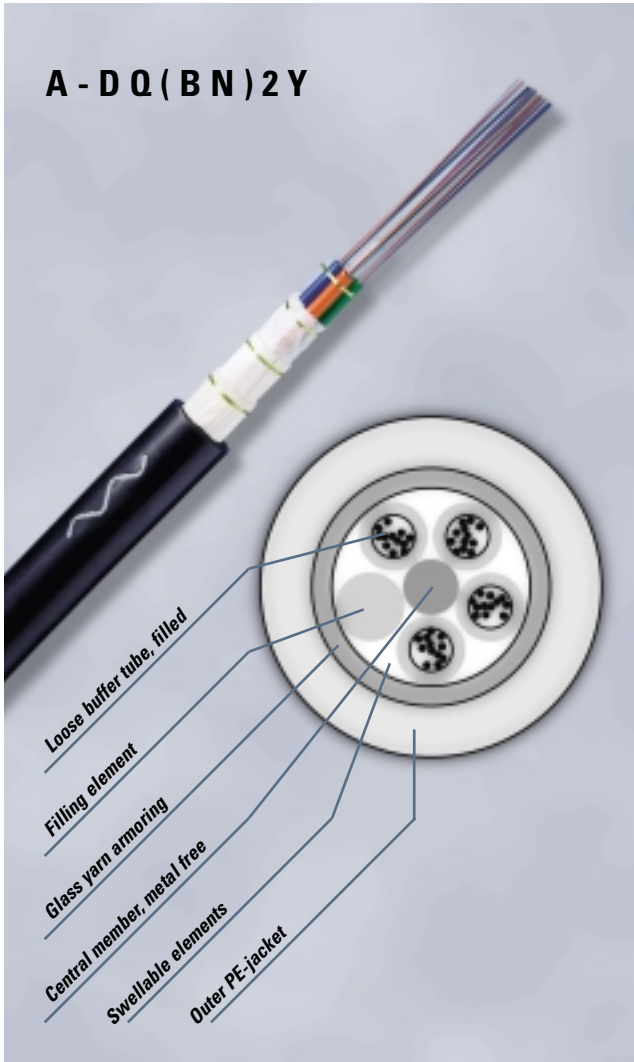
Ordering data

Type designation	No. of fibers	Fibers per loose buffer tube	No. of loose buffer tubes	No. of stranding elements	Outer Ø (mm)	Net weight (kg/km)	Max. tensile load during install. (N)	Min. bending radius during install. (mm)
A-DQ(ZN)2Y4Y 2x6	12	6	2	5	11.2	82	2700	196
A-DQ(ZN)2Y4Y 3x6	18	6	3	5	11.2	82	2700	196
A-DQ(ZN)2Y4Y 4x6	24	6	4	5	11.2	82	2700	196
A-DQ(ZN)2Y4Y 3x12	36	12	3	5	12.5	104	2700	219
A-DQ(ZN)2Y4Y 4x12	48	12	4	5	12.5	104	2700	219
A-DQ(ZN)2Y4Y 5x12	60	12	5	5	12.5	104	2700	219
A-DQ(ZN)2Y4Y 6x12	72	12	6	6	13.2	117	2700	231
A-DQ(ZN)2Y4Y 8x12	96	12	8	8	14.9	148	2700	261
A-DQ(ZN)2Y4Y 12x12	144	12	12	12	18.2	221	2700	319
A-DQ(ZN)2Y4Y 16x12	192	12	16	5+11	18.2	224	2700	319
A-DQ(ZN)2Y4Y 24x12	288	12	24	9+15	20.6	305	2700	361

Other attenuation values, fiber counts and cable designs on request.

Fiber optic duct cable

stranded tube design, non-metallic, dry core, rodent protection



Applications

- Pulling into duct systems
- Laying in concrete channels
- Laying on cable racks
- In areas with rodents
- Direct buried in sand beds

Special features

- Single-layer stranded construction (up to 144 fibers)
- Double-layer stranded construction (> 144 fibers, up to 288 fibers)
- Non-metallic construction
- No problems with grounding or potential equalization
- Dry core construction
- Rodent protection provided by laminated glass yarn
- Light, thin and robust cables

Temperature range

- Laying and installation -5°C to 50°C
- Operation -30°C to 70°C
- Transport and storage -40°C to 70°C

Test procedures to IEC 60793-1, 60794-1-2

- Tensile strength
- Impact resistance
- Crush resistance
- Bending characteristics
- Temperature cycling
- Water penetration

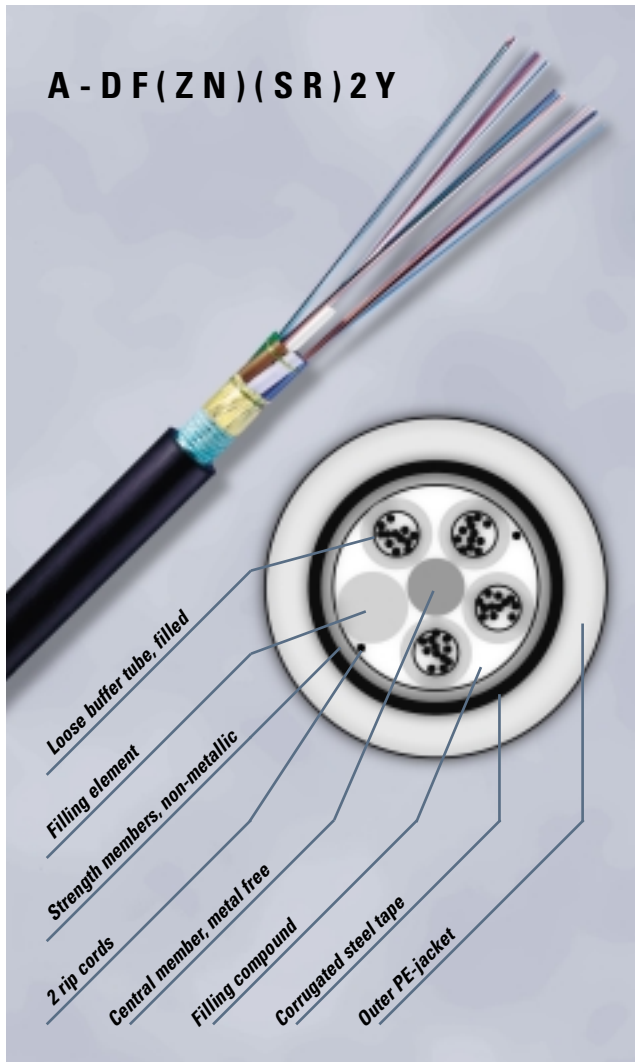
Ordering data

Type designation	No. of fibers	Fibers per loose buffer tube	No. of loose buffer tubes	No. of stranding elements	Outer Ø (mm)	Net weight (kg/km)	Max. tensile load during install. (N)	Min. bending radius during install. (mm)
A-DQ(BN)2Y 2x6	12	6	2	5	10.0	82	4000	225
A-DQ(BN)2Y 3x6	18	6	3	5	10.0	82	4000	225
A-DQ(BN)2Y 4x6	24	6	4	5	10.0	82	4000	225
A-DQ(BN)2Y 3x12	36	12	3	5	11.3	104	4000	255
A-DQ(BN)2Y 4x12	48	12	4	5	11.3	104	4000	255
A-DQ(BN)2Y 5x12	60	12	5	5	11.3	104	4000	255
A-DQ(BN)2Y 6x12	72	12	6	6	12.0	119	4000	270
A-DQ(BN)2Y 8x12	96	12	8	8	13.7	153	4000	309
A-DQ(BN)2Y 12x12	144	12	12	12	17.0	231	4000	383
A-DQ(BN)2Y 16x12	192	12	16	5+11	16.3	191	4000	367
A-DQ(BN)2Y 24x12	288	12	24	9+15	19.3	295	4000	435

Other attenuation values, fiber counts and cable designs on request.

Fiber optic buried cable

stranded tube design, non-metallic central member, corrugated steel tape



Applications

- Direct burial
- In applications with high mechanical loads
- In areas with rodents

Special features

- Single-layer stranded construction (up to 144 fibers)
- Double-layer stranded construction (> 144 fibers, up to 288 fibers)
- Corrugated steel tape as protection against rodents and mechanical damage
- Thin and robust cables

Temperature range

- Laying and installation -5°C to 50°C
- Operation -30°C to 70°C
- Transport and storage -40°C to 70°C

Test procedures to IEC 60793-1, 60794-1-2

- Tensile strength
- Impact resistance
- Crush resistance
- Bending characteristics
- Temperature cycling
- Water penetration

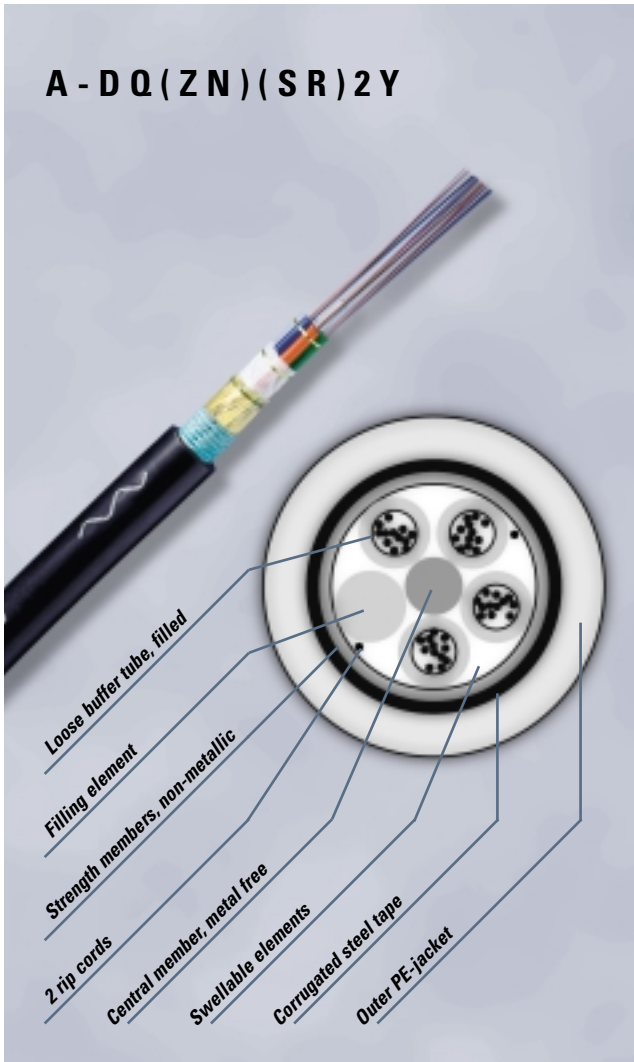
Ordering data

Type designation	No. of fibers	Fibers per loose buffer tube	No. of loose buffer tubes	No. of stranding elements	Outer Ø (mm)	Net weight (kg/km)	Max. tensile load during install. (N)	Min. bending radius during install. (mm)
A-DF(ZN)(SR)2Y 2x6	12	6	2	5	10.9	112	2700	246
A-DF(ZN)(SR)2Y 3x6	18	6	3	5	10.9	112	2700	246
A-DF(ZN)(SR)2Y 4x6	24	6	4	5	10.9	112	2700	246
A-DF(ZN)(SR)2Y 3x12	36	12	3	5	12.2	137	2700	275
A-DF(ZN)(SR)2Y 4x12	48	12	4	5	12.2	137	2700	275
A-DF(ZN)(SR)2Y 5x12	60	12	5	5	12.2	137	2700	275
A-DF(ZN)(SR)2Y 6x12	72	12	6	6	12.9	152	2700	291
A-DF(ZN)(SR)2Y 8x12	96	12	8	8	14.6	191	2700	329
A-DF(ZN)(SR)2Y 12x12	144	12	12	12	17.9	278	2700	403
A-DF(ZN)(SR)2Y 16x12	192	12	16	5+11	16.5	250	2700	372
A-DF(ZN)(SR)2Y 24x12	288	12	24	9+15	18.9	343	2700	426

Other attenuation values, fiber counts and cable designs on request.

Fiber optic buried cable

stranded tube design, non-metallic central member, dry core, corrugated steel tape



Applications

- Direct burial
- In applications with high mechanical loads
- In areas with rodents

Special features

- Single-layer stranded construction (up to 144 fibers)
- Double-layer stranded construction (> 144 fibers, up to 288 fibers)
- Corrugated steel tape as protection against rodents and mechanical damage
- Dry core construction
- Thin and robust cables

Temperature range

- Laying and installation -5°C to 50°C
- Operation -30°C to 70°C
- Transport and storage -40°C to 70°C

Test procedures to IEC 60793-1, 60794-1-2

- Tensile strength
- Impact resistance
- Crush resistance
- Bending characteristics
- Temperature cycling
- Water penetration

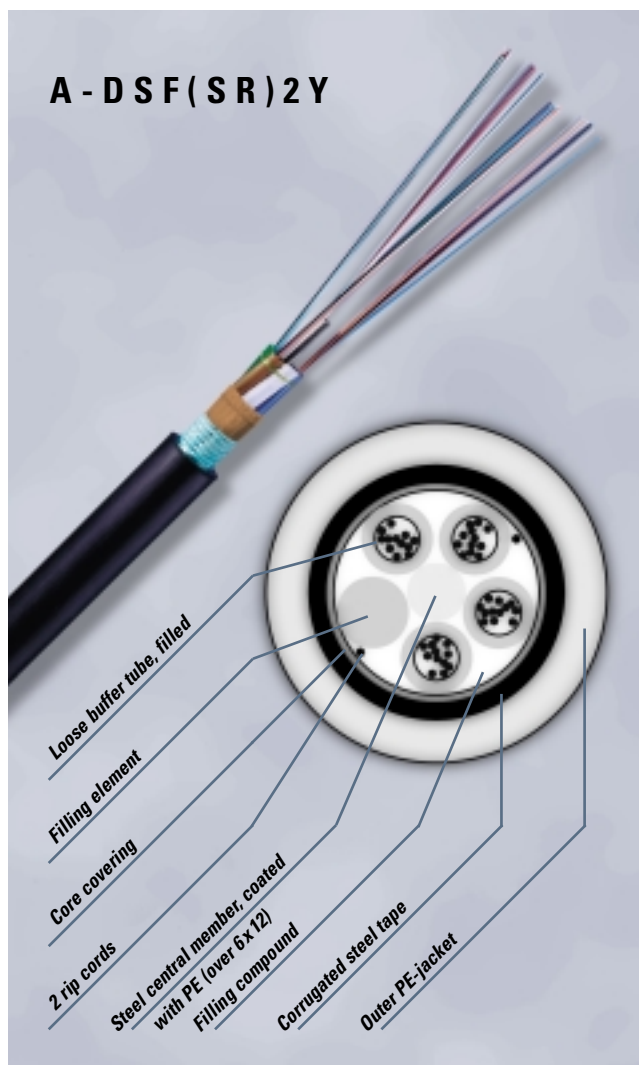
Ordering data

Type designation	No. of fibers	Fibers per loose buffer tube	No. of loose buffer tubes	No. of stranding elements	Outer Ø (mm)	Net weight (kg/km)	Max. tensile load during install. (N)	Min. bending radius during install. (mm)
A-DQ(ZN)(SR)2Y 2x6	12	6	2	5	10.7	105	2700	241
A-DQ(ZN)(SR)2Y 3x6	18	6	3	5	10.7	105	2700	241
A-DQ(ZN)(SR)2Y 4x6	24	6	4	5	10.7	105	2700	241
A-DQ(ZN)(SR)2Y 3x12	36	12	3	5	12.0	131	2700	270
A-DQ(ZN)(SR)2Y 4x12	48	12	4	5	12.0	131	2700	270
A-DQ(ZN)(SR)2Y 5x12	60	12	5	5	12.0	131	2700	270
A-DQ(ZN)(SR)2Y 6x12	72	12	6	6	12.7	147	2700	286
A-DQ(ZN)(SR)2Y 8x12	96	12	8	8	14.4	183	2700	324
A-DQ(ZN)(SR)2Y 12x12	144	12	12	12	17.7	264	2700	400
A-DQ(ZN)(SR)2Y 16x12	192	12	16	5+11	16.7	234	2700	376
A-DQ(ZN)(SR)2Y 24x12	288	12	24	9+15	19.7	326	2700	444

Other attenuation values, fiber counts and cable designs on request.

Fiber optic buried cable

stranded tube design, metallic central member, corrugated steel tape



Applications

- Direct burial
- In applications with high mechanical loads
- In areas with rodents

Special features

- Single-layer stranded construction (up to 144 fibers)
- Double-layer stranded construction (> 144 fibers, up to 288 fibers)
- Corrugated steel tape as protection against rodents and mechanical damage
- Thin and robust cables

Temperature range

- Laying and installation -5°C to 50°C
- Operation -30°C to 70°C
- Transport and storage -40°C to 70°C

Test procedures to IEC 60793-1, 60794-1-2

- Tensile strength
- Impact resistance
- Crush resistance
- Bending characteristics
- Temperature cycling
- Water penetration

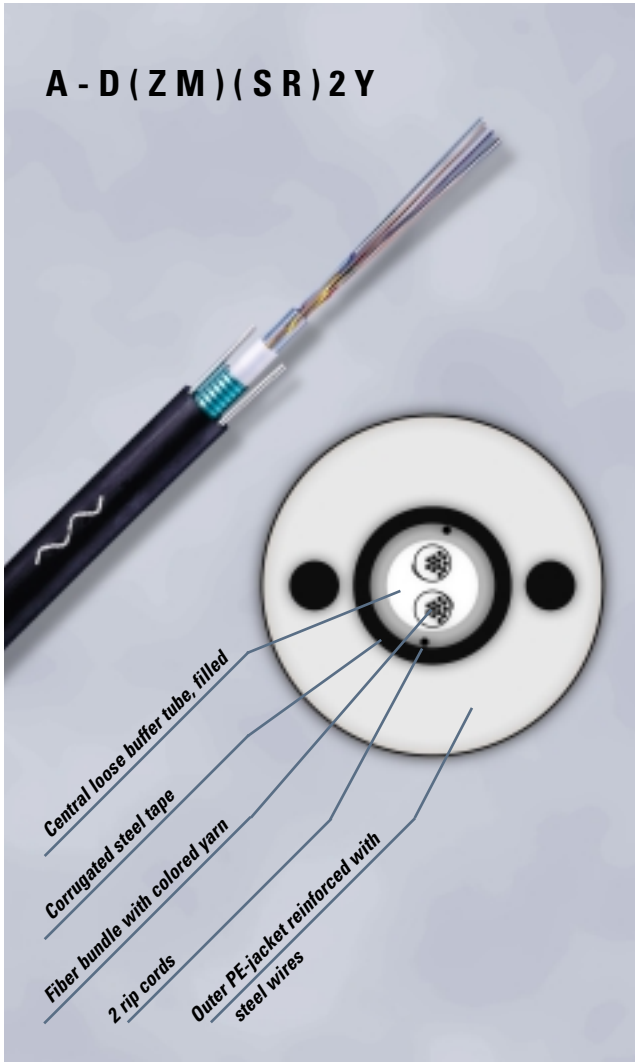
Ordering data

Type designation	No. of fibers	Fibers per loose buffer tube	No. of loose buffer tubes	No. of stranding elements	Outer Ø (mm)	Net weight (kg/km)	Max. tensile load during install. (N)	Min. bending radius during install. (mm)
A-DSF(SR)2Y 2x6	12	6	2	5	10.9	134	2700	246
A-DSF(SR)2Y 3x6	18	6	3	5	10.9	134	2700	246
A-DSF(SR)2Y 4x6	24	6	4	5	10.9	134	2700	246
A-DSF(SR)2Y 3x12	36	12	3	5	11.6	148	2700	261
A-DSF(SR)2Y 4x12	48	12	4	5	11.6	148	2700	261
A-DSF(SR)2Y 5x12	60	12	5	5	11.6	148	2700	261
A-DSF(SR)2Y 6x12	72	12	6	6	12.3	160	2700	277
A-DSF(SR)2Y 8x12	96	12	8	8	14.0	202	2700	315
A-DSF(SR)2Y 12x12	144	12	12	12	17.3	294	2700	390
A-DSF(SR)2Y 16x12	192	12	16	5+11	16.0	265	2700	360
A-DSF(SR)2Y 24x12	288	12	24	9+15	19.0	358	2700	428

Other attenuation values, fiber counts and cable designs on request.

Fiber optic buried cable

central tube design, corrugated steel tape



Applications

- Direct burial
- In applications with high mechanical loads
- In areas with rodents

Special features

- Central tube construction
- Corrugated steel tape as protection against rodents and mechanical damage
- Thin and robust cables

Temperature range

- Laying and installation -5°C to 50°C
- Operation -30°C to 70°C
- Transport and storage -40°C to 70°C

Test procedures to IEC 60793-1 and 60794-1-2

- Tensile strength
- Impact resistance
- Crush resistance
- Bending characteristics
- Temperature cycling
- Water penetration

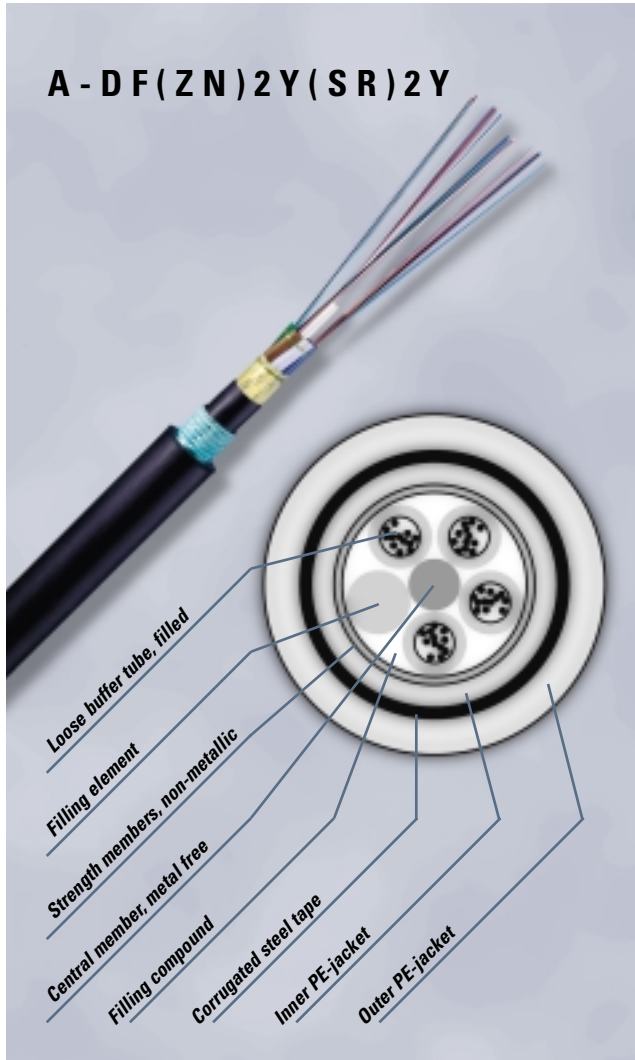
Ordering data

Type designation	No. of fibers	Fibers per fiber bundle	No. of fiber bundles	Central buffer tube Ø (mm)	Outer Ø (mm)	Net weight (kg/km)	Max. tensile load during install. (N)	Min. bending radius during install. (mm)
A-D(ZM)(SR)2Y 1x8	8	8	1	4.2	12.1	156	2700	270
A-D(ZM)(SR)2Y 1x10	10	10	1	4.2	12.1	156	2700	270
A-D(ZM)(SR)2Y 1x12	12	12	1	4.2	12.1	156	2700	270
A-D(ZM)(SR)2Y 1x16	16	8	2	4.2	12.1	156	2700	270
A-D(ZM)(SR)2Y 1x20	20	10	2	4.2	12.1	156	2700	270
A-D(ZM)(SR)2Y 1x24	24	12	2	4.2	12.1	156	2700	270
A-D(ZM)(SR)2Y 1x36	36	12	3	6	13.9	198	2700	310
A-D(ZM)(SR)2Y 1x48	48	12	4	6	13.9	198	2700	310
A-D(ZM)(SR)2Y 1x96	96	12	8	8	15.9	248	2700	355

Other attenuation values, fiber counts and cable designs on request.

Fiber optic buried cable

stranded tube design, non-metallic central member,
corrugated steel tape, inner jacket



Applications

- Direct burial
- Where there are particularly high mechanical loads
- In areas with rodents

Special features

- Single-layer stranded construction (up to 144 fibers)
- Double-layer stranded construction (> 144 fibers, up to 288 fibers)
- Corrugated steel tape as protection against rodents and mechanical damage
- Particularly robust cables

Temperature range

- Laying and installation -5°C to 50°C
- Operation -30°C to 70°C
- Transport and storage -40°C to 70°C

Test procedures to IEC 60793-1, 60794-1-2

- Tensile strength
- Impact resistance
- Crush resistance
- Bending characteristics
- Temperature cycling
- Water penetration

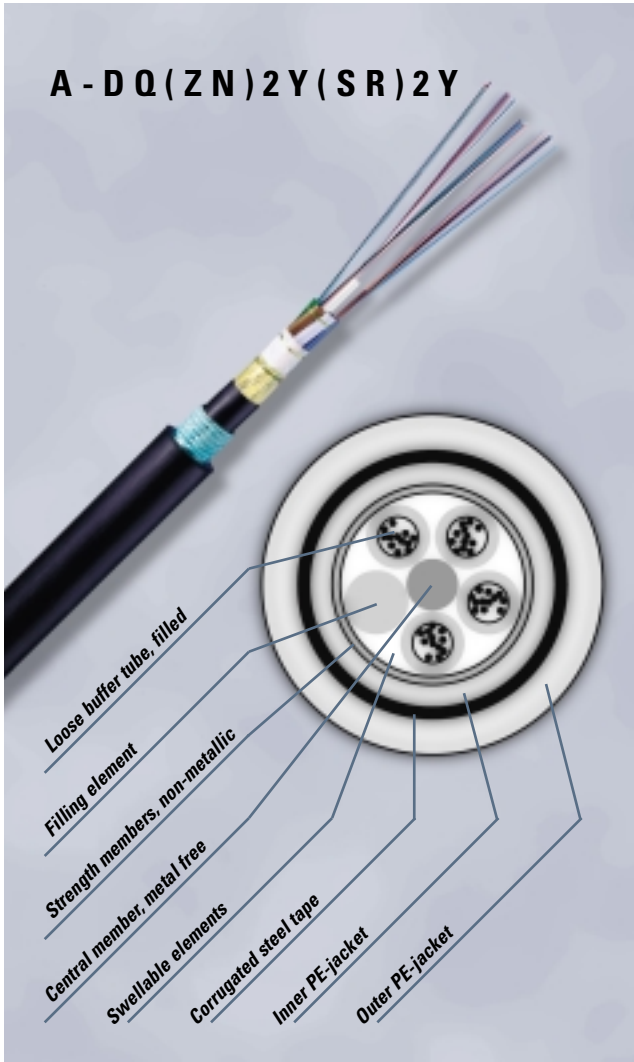
Ordering data

Type designation	No. of fibers	Fibers per loose buffer tube	No. of loose buffer tubes	No. of stranding elements	Outer Ø (mm)	Net weight (kg/km)	Max. tensile load during install. (N)	Min. bending radius during install. (mm)
A-DF(ZN)2Y(SR)2Y 2x6	12	6	2	5	13.2	165	2700	297
A-DF(ZN)2Y(SR)2Y 3x6	18	6	3	5	13.2	165	2700	297
A-DF(ZN)2Y(SR)2Y 4x6	24	6	4	5	13.2	165	2700	297
A-DF(ZN)2Y(SR)2Y 3x12	36	12	3	5	14.4	195	2700	324
A-DF(ZN)2Y(SR)2Y 4x12	48	12	4	5	14.4	195	2700	324
A-DF(ZN)2Y(SR)2Y 5x12	60	12	5	5	14.4	195	2700	324
A-DF(ZN)2Y(SR)2Y 6x12	72	12	6	6	15.1	213	2700	340
A-DF(ZN)2Y(SR)2Y 8x12	96	12	8	8	16.8	259	2700	378
A-DF(ZN)2Y(SR)2Y 12x12	144	12	12	12	20.1	358	2700	453
A-DF(ZN)2Y(SR)2Y 16x12	192	12	16	5+11	18.1	309	2700	407
A-DF(ZN)2Y(SR)2Y 24x12	288	12	24	9+15	21.1	418	2700	475

Other attenuation values, fiber counts and cable designs on request.

Fiber optic buried cable

stranded tube design, non-metallic central member,
dry core, corrugated steel tape, inner jacket



Applications

- Direct burial
- Where there are particularly high mechanical loads
- In areas with rodents

Special features

- Single-layer stranded construction (up to 144 fibers)
- Double-layer stranded construction (> 144 fibers, up to 288 fibers)
- Corrugated steel tape as protection against rodents and mechanical damage
- Dry core construction
- Particularly robust cables

Temperature range

- Laying and installation -5°C to 50°C
- Operation -30°C to 70°C
- Transport and storage -40°C to 70°C

Test procedures to IEC 60793-1, 60794-1-2

- Tensile strength
- Impact resistance
- Crush resistance
- Bending characteristics
- Temperature cycling
- Water penetration

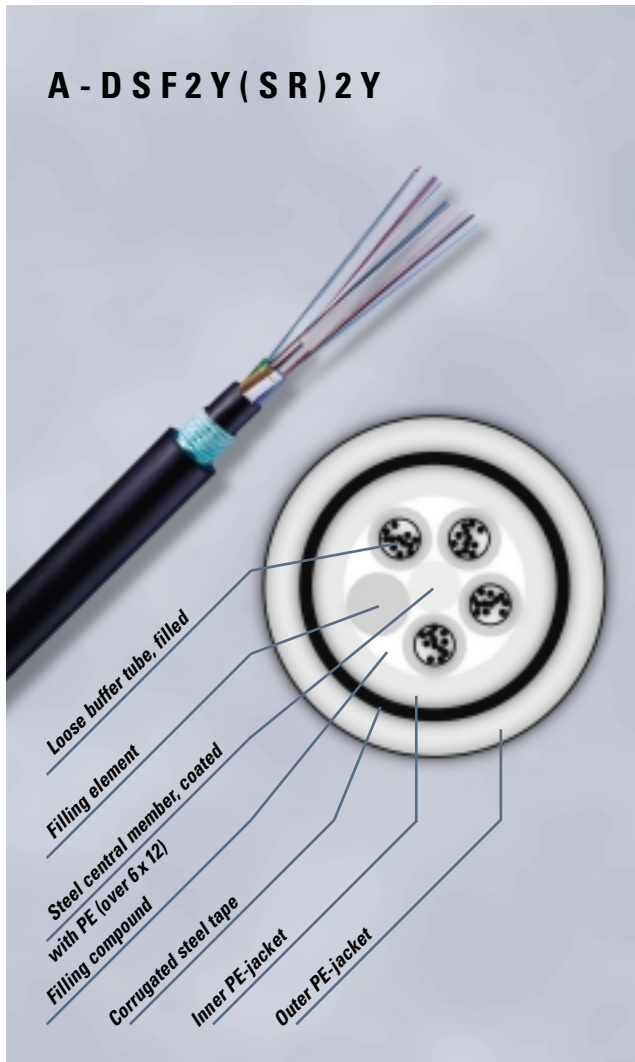
Ordering data

Type designation	No. of fibers	Fibers per loose buffer tube	No. of loose buffer tubes	No. of stranding elements	Outer Ø (mm)	Net weight (kg/km)	Max. tensile load during install. (N)	Min. bending radius during install. (mm)
A-DQ(ZN)2Y(SR)2Y 2x6	12	6	2	5	13.5	167	2700	304
A-DQ(ZN)2Y(SR)2Y 3x6	18	6	3	5	13.5	167	2700	304
A-DQ(ZN)2Y(SR)2Y 4x6	24	6	4	5	13.5	167	2700	304
A-DQ(ZN)2Y(SR)2Y 3x12	36	12	3	5	14.8	191	2700	333
A-DQ(ZN)2Y(SR)2Y 4x12	48	12	4	5	14.8	191	2700	333
A-DQ(ZN)2Y(SR)2Y 5x12	60	12	5	5	14.8	191	2700	333
A-DQ(ZN)2Y(SR)2Y 6x12	72	12	6	6	15.5	207	2700	349
A-DQ(ZN)2Y(SR)2Y 8x12	96	12	8	8	17.2	243	2700	387
A-DQ(ZN)2Y(SR)2Y 12x12	144	12	12	12	20.5	357	2700	462
A-DQ(ZN)2Y(SR)2Y 16x12	192	12	16	5+11	18.9	301	2700	426
A-DQ(ZN)2Y(SR)2Y 24x12	288	12	24	9+15	21.9	373	2700	493

Other attenuation values, fiber counts and cable designs on request.

Fiber optic buried cable

stranded tube design, metallic central member,
corrugated steel tape, inner jacket



Applications

- Direct burial
- Where there are particularly high mechanical loads
- In areas with rodents

Special features

- Single-layer stranded construction (up to 144 fibers)
- Double-layer stranded construction (> 144 fibers, up to 288 fibers)
- Corrugated steel tape as protection against rodents and mechanical damage
- Particularly robust cables

Temperature range

- Laying and installation -5°C to 50°C
- Operation -30°C to 70°C
- Transport and storage -40°C to 70°C

Test procedures to IEC 60793-1, 60794-1-2

- Tensile strength
- Impact resistance
- Crush resistance
- Bending characteristics
- Temperature cycling
- Water penetration

Ordering data

Type designation	No. of fibers	Fibers per loose buffer tube	No. of loose buffer tubes	No. of stranding elements	Outer Ø (mm)	Net weight (kg/km)	Max. tensile load during install. (N)	Min. bending radius during install. (mm)
A-DSF2Y(SR)2Y 2x6	12	6	2	5	13.1	171	2700	295
A-DSF2Y(SR)2Y 3x6	18	6	3	5	13.1	171	2700	295
A-DSF2Y(SR)2Y 4x6	24	6	4	5	13.1	171	2700	295
A-DSF2Y(SR)2Y 3x12	36	12	3	5	14.0	200	2700	315
A-DSF2Y(SR)2Y 4x12	48	12	4	5	14.0	200	2700	315
A-DSF2Y(SR)2Y 5x12	60	12	5	5	14.0	200	2700	315
A-DSF2Y(SR)2Y 6x12	72	12	6	6	14.5	218	2700	326
A-DSF2Y(SR)2Y 8x12	96	12	8	8	16.2	267	2700	365
A-DSF2Y(SR)2Y 12x12	144	12	12	12	19.5	366	2700	439
A-DSF2Y(SR)2Y 16x12	192	12	16	5+11	18.2	338	2700	410
A-DSF2Y(SR)2Y 24x12	288	12	24	9+15	21.2	433	2700	477

Other attenuation values, fiber counts and cable designs on request.

FiberWay Ribbon designs

The FiberWay Ribbon Cable family includes cable designs with fiber ribbons in stranded loose tubes up to 864 fibers, in central tube cables up to 432 fibers and slotted core cables up to 1000 fibers. With a tensile strength of 2700 N, these are suitable for all methods of cable laying. Their temperature range of -30°C to +70°C also covers almost all climatic conditions throughout the world.

Our fiber ribbons are very easy to split up into individual fibers (peelable), too, so that there is no problem in connecting to interfaces of existing networks which have individual fibers. It is possible to splice up to twelve fibers simultaneously, reducing the time necessary for splicing.

The fiber ribbons are distinguishable from each other by a count number printed on them.

The cables are tested in accordance with IEC 60793-1 and 60794-1-2.

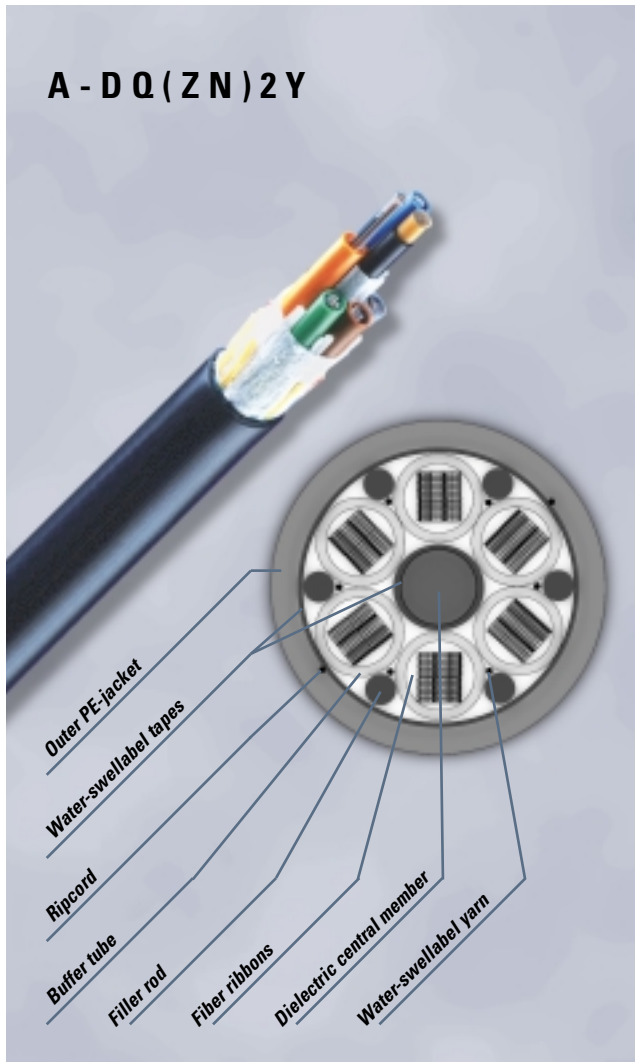
Summary of the selection criteria for FiberWay Ribbon designs cables

	Duct cable	Page	Buried cable	Page
Stranded tube design	A-DQ(ZN)2Y	41	A-DQ(ZN)(SR)2Y	42
Central tube design	A-D(ZN)(2ZN)2Y	43	A-D(ZM)(SR)2Y	44
Slotted core design	A-KF(ZN)2Y	45	A-KF2Y(ZN)(SR)2Y	46



Fiber optic duct cable

Layered, non-metallic, fiber ribbon design



Applications

- Pulling into duct systems
- Laying in concrete channels
- Laying on cable racks

Special features

- Fiber ribbon technology
- Single stranded layer (up to 864 fibers)
- Non-metallic construction
- No problems with grounding or potential equalization
- Rugged cable

Temperature range

- Laying and installation -5 °C to 50 °C
- Operation -40 °C to 70 °C
- Transport and storage -40 °C to 70 °C

Test procedures to IEC 60793-1 and 60794-1-2

- Tensile strength
- Impact resistance
- Crush resistance
- Bending characteristics
- Temperature cycling
- Water penetration

Ordering data

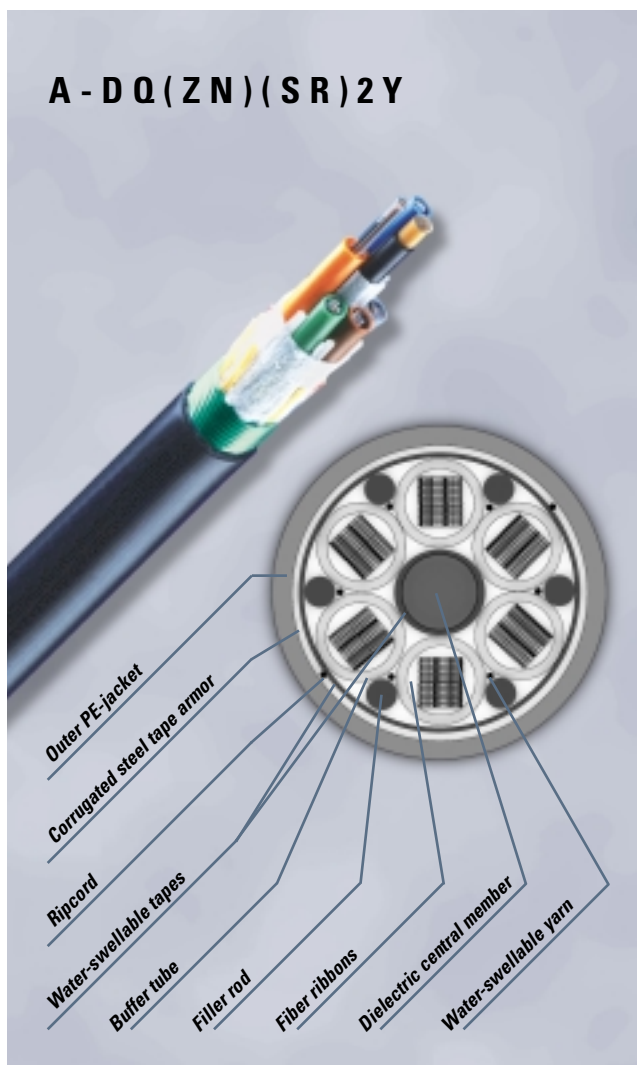
Type designation	No. of fibers	No. of fiber ribbons per loose tube	No. of tube positions	Outer Ø (mm)	Net weight (kg/km)	Max. tensile load during install. (N)	Min. bending radius during install. (mm)
A-DQ(ZN)2Y 4x(6x12)	288	6	5*	22.3	351	2700	335
A-DQ(ZN)2Y 5x(6x12)	360	6	5	22.3	363	2700	335
A-DQ(ZN)2Y 6x(6x12)	432	6	6	24.4	424	2700	366
A-DQ(ZN)2Y 4x(12x12)	576	12	5*	24.9	420	2700	374
A-DQ(ZN)2Y 5x(12x12)	720	12	5	24.9	441	2700	374
A-DQ(ZN)2Y 6x(12x12)	864	12	6	26.2	534	2700	393

* 4 tubes plus 1 filler

Max. attenuation values in the cable: 0.40 dB/km at 1310 nm and 0.25 dB/km at 1550 nm.
Other attenuation values, fiber counts and cable designs on request.

Fiber optic buried cable

Layered, non-met., strength member, corrug. steel sheath, fiber ribbon design



Applications

- Direct burial
- Where there are particularly high mechanical loads
- In areas with rodents

Special features

- Fiber ribbon technology
- Single stranded layer (up to 864 fibers)
- Corrugated steel tape for protection against rodents and mechanical damage
- Rugged cable

Temperature range

- Laying and installation -5°C to 50°C
- Operation -40°C to 70°C
- Transport and storage -40°C to 70°C

Test procedures to IEC 60793-1, 60794-1-2

- Tensile strength
- Impact resistance
- Crush resistance
- Bending characteristics
- Temperature cycling
- Water penetration

Ordering data

Type designation	No. of fibers	No. of fiber ribbons per loose tube	No. of tube positions	Outer Ø (mm)	Net weight (kg/km)	Max. tensile load during install. (N)	Min. bending radius during install. (mm)
A-DQ(ZN)(SR)2Y 4x(6x12)	288	6	5*	23.5	467	2700	353
A-DQ(ZN)(SR)2Y 5x(6x12)	360	6	5	23.5	482	2700	353
A-DQ(ZN)(SR)2Y 6x(6x12)	432	6	6	25.0	539	2700	375
A-DQ(ZN)(SR)2Y 4x(12x12)	576	12	5*	25.1	511	2700	377
A-DQ(ZN)(SR)2Y 5x(12x12)	720	12	5	25.1	561	2700	377
A-DQ(ZN)(SR)2Y 6x(12x12)	864	12	6	28.5	678	2700	428

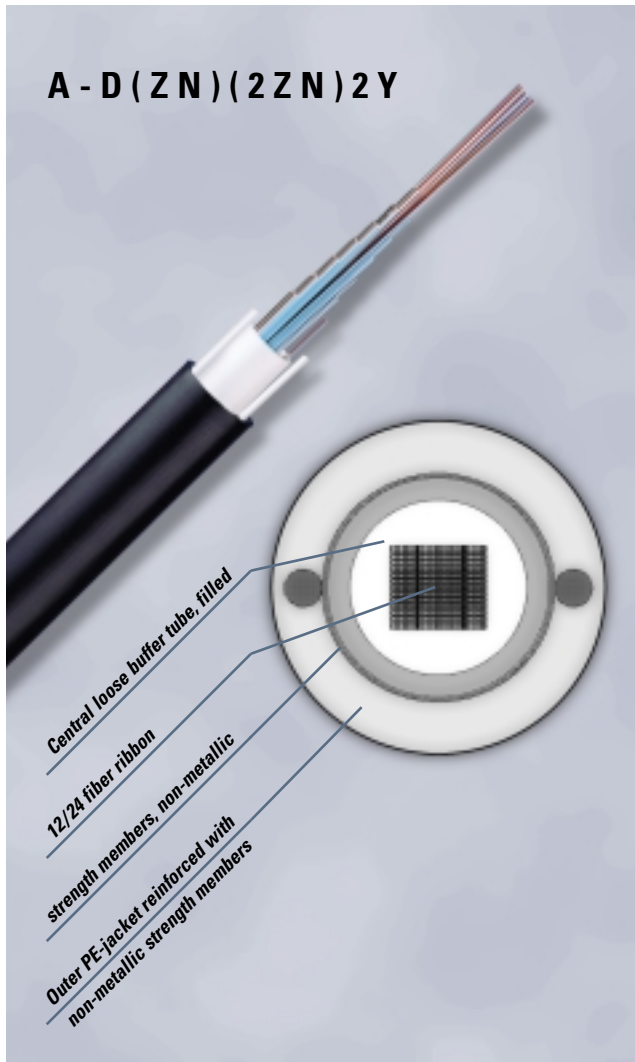
* 4 tubes plus 1 filler

Max. attenuation values in the cable: 0.40 dB/km at 1310 nm and 0.25 dB/km at 1550 nm.

Other attenuation values, fiber counts and cable designs on request.

Fiber optic duct cable

central tube design, non-metallic, fiber ribbon technology



Applications

- Pulling into duct systems
- Laying in concrete channels
- Laying on cable racks

Special features

- Fiber ribbon technology
- Central tube construction
- Non-metallic construction
- No problems with grounding or potential equalization
- Light, thin and robust cables

Temperature range

- Laying and installation -5°C to 50°C
- Operation -30°C to 70°C
- Transport and storage -40°C to 70°C

Test procedures to IEC 60793-1 and 60794-1-2

- Tensile strength
- Impact resistance
- Crush resistance
- Bending characteristics
- Temperature cycling
- Water penetration

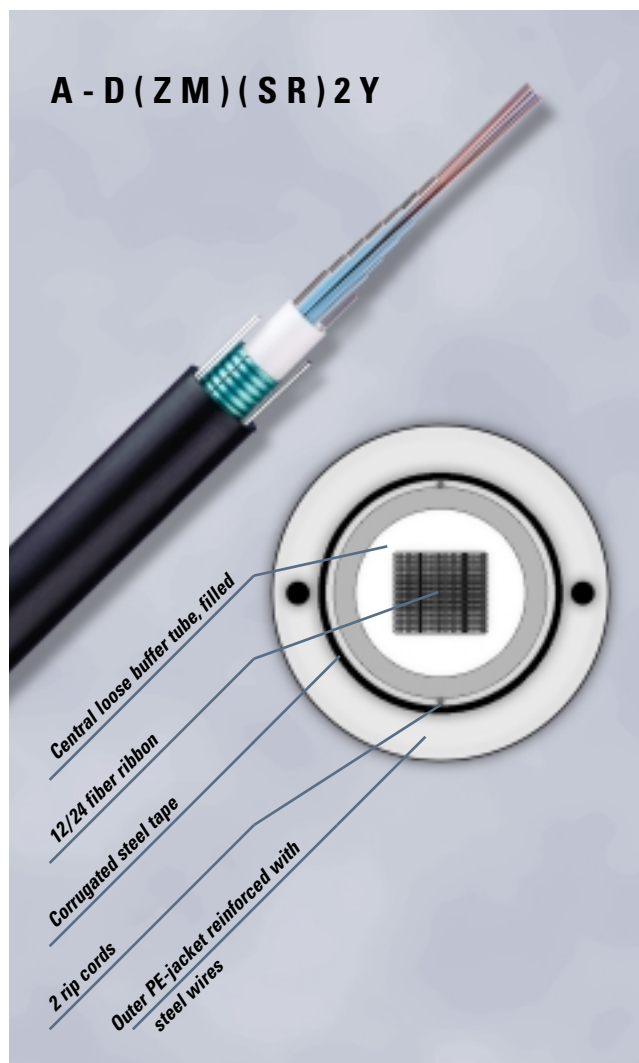
Ordering data

Type designation	No. of fibers	Fibers per fiber ribbon	No. of fiber ribbons	Central buffer tube Ø (mm)	Outer Ø (mm)	Net weight (kg/km)	Max. tensile load during install. (N)	Min. bending radius during install. (mm)
A-D(ZN)(2ZN)2Y 4x12	48	12	4	8	15.6	194	2700	273
A-D(ZN)(2ZN)2Y 5x12	60	12	5	8	15.6	194	2700	273
A-D(ZN)(2ZN)2Y 6x12	72	12	6	8	15.6	194	2700	273
A-D(ZN)(2ZN)2Y 8x12	96	12	8	8	15.6	194	2700	273
A-D(ZN)(2ZN)2Y 10x12	120	12	10	10.2	17.8	252	2700	312
A-D(ZN)(2ZN)2Y 12x12	144	12	12	10.2	17.8	252	2700	312
A-D(ZN)(2ZN)2Y 16x12	192	12	16	10.2	17.8	252	2700	312
A-D(ZN)(2ZN)2Y 18x12	216	12	18	10.2	17.8	252	2700	312
A-D(ZN)(2ZN)2Y 10x24	240	24	10	14.6	22.2	386	2700	389
A-D(ZN)(2ZN)2Y 12x24	288	24	12	14.6	22.2	386	2700	389
A-D(ZN)(2ZN)2Y 18x24	432	24	18	14.6	22.2	386	2700	389

Max. attenuation values in the cable: 0.40 dB/km at 1310 nm and 0.25 dB/km at 1550 nm.
Other attenuation values, numbers of fibers and cable constructions on request.

Fiber optic buried cable

central tube design, fiber ribbon technology, corrugated steel tape



A - D (Z M) (S R) 2 Y

Applications

- Direct burial
- In applications with high mechanical loads
- In areas with rodents

Special features

- Fiber ribbon technology
- Central tube construction
- Corrugated steel tape as protection against rodents and mechanical damage
- Thin and robust cables

Temperature range

- Laying and installation –5°C to 50°C
- Operation –30°C to 70°C
- Transport and storage –40°C to 70°C

Test procedures to IEC 60793-1 and 60794-1-2

- Tensile strength
- Impact resistance
- Crush resistance
- Bending characteristics
- Temperature cycling
- Water penetration

Ordering data

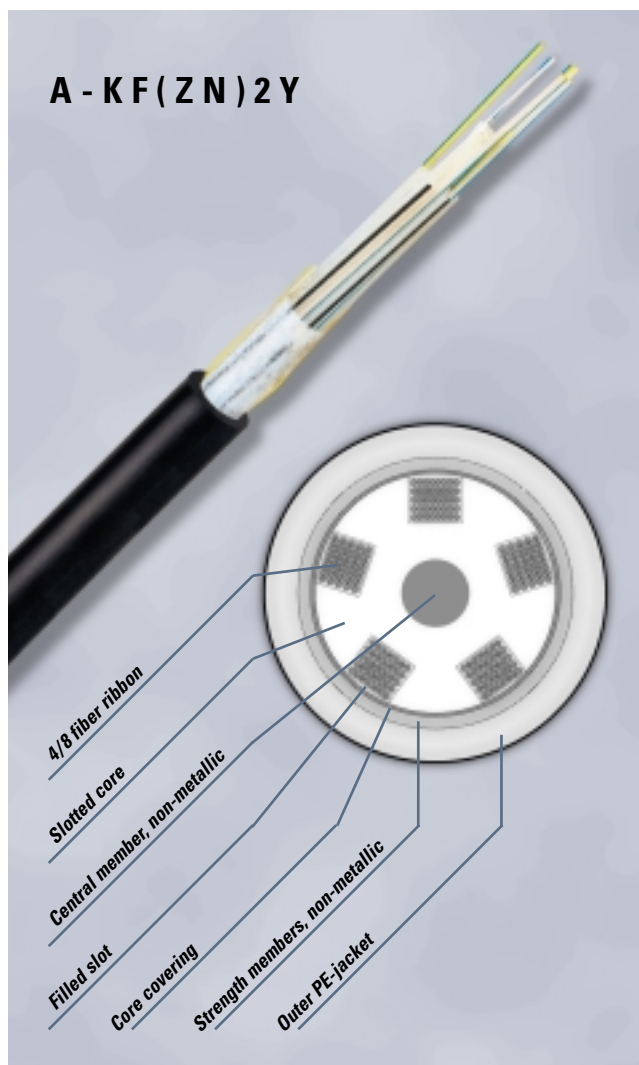
Type designation	No. of fibers	Fibers per fiber ribbon	No. of fiber ribbons	Central buffer tube Ø (mm)	Outer Ø (mm)	Net weight (kg/km)	Max. tensile load during install. (N)	Min. bending radius during install. (mm)
A-D(ZM)(SR)2Y 4x12	48	12	4	8	16.6	268	2700	291
A-D(ZM)(SR)2Y 5x12	60	12	5	8	16.6	268	2700	291
A-D(ZM)(SR)2Y 6x12	72	12	6	8	16.6	268	2700	291
A-D(ZM)(SR)2Y 8x12	96	12	8	8	16.6	268	2700	291
A-D(ZM)(SR)2Y 10x12	120	12	10	10.2	18.8	337	2700	329
A-D(ZM)(SR)2Y 12x12	144	12	12	10.2	18.8	337	2700	329
A-D(ZM)(SR)2Y 16x12	192	12	16	10.2	18.8	337	2700	329
A-D(ZM)(SR)2Y 18x12	216	12	18	10.2	18.8	337	2700	329
A-D(ZM)(SR)2Y 10x24	240	24	10	14.6	23.2	488	2700	406
A-D(ZM)(SR)2Y 12x24	288	24	12	14.6	23.2	488	2700	406
A-D(ZM)(SR)2Y 18x24	432	24	18	14.6	23.2	488	2700	406

Max. attenuation values in the cable: 0.40 dB/km at 1310 nm and 0.25 dB/km at 1550 nm.

Other attenuation values, numbers of fibers and cable constructions on request.

Fiber optic duct cable

slotted core design, non-metallic, fiber ribbon technology



Applications

- Pulling into duct systems
- Laying in concrete channels
- Laying on cable racks

Special features

- Fiber ribbon technology
- Slotted core construction
- Non-metallic construction
- No problems with grounding or potential equalization
- Robust cables

Temperature range

- Laying and installation -5°C to 50°C
- Operation -30°C to 60°C
- Transport and storage -30°C to 70°C

Test procedures to IEC 60793-1, 60794-1-2

- Tensile strength
- Impact resistance
- Crush resistance
- Bending characteristics
- Temperature cycling
- Water penetration

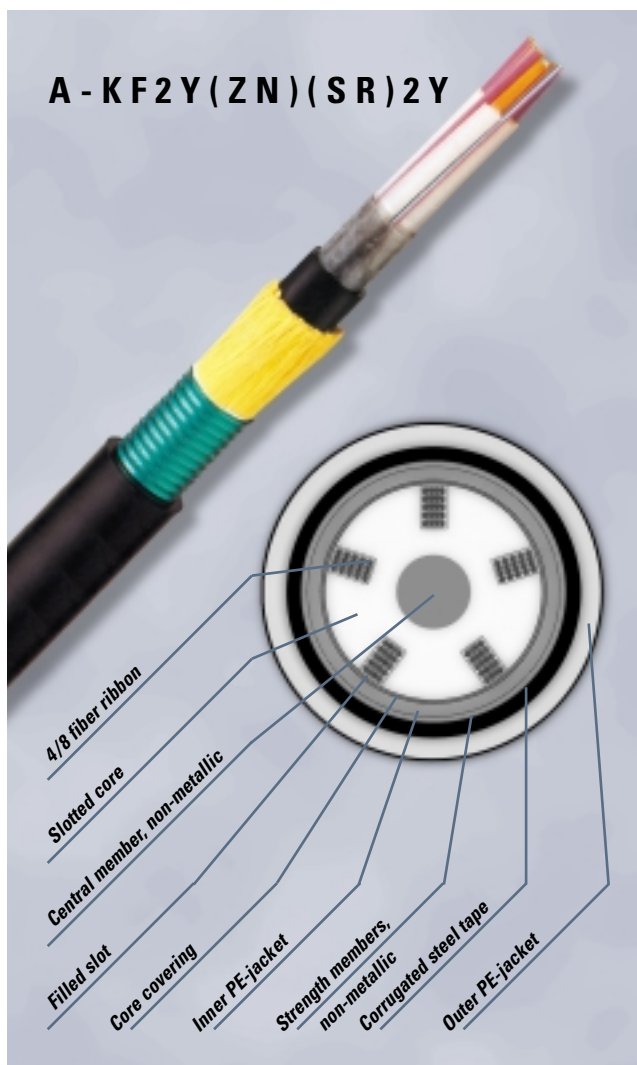
Ordering data

Type designation	No. of fibers	Fibers per fiber ribbon	No. of fiber ribbons per slot	No. of slots	Outer Ø (mm)	Net weight (kg/km)	Max. tensile load during install. (N)	Min. bending radius during install. (mm)
A-KF(ZN)2Y (1x)1x1x4	4	4	1	2	10.0	75	2500	150
A-KF(ZN)2Y (1x)2x1x4	8	4	2	2	10.0	75	2500	150
A-KF(ZN)2Y (1x)5x1x4	20	4	1	5	11.0	100	2500	180
A-KF(ZN)2Y (1x)5x2x4	40	4	2	5	14.5	165	2500	220
A-KF(ZN)2Y (1x)5x4x4	80	4	4	5	14.5	165	2500	220
A-KF(ZN)2Y (1x)5x5x4	100	4	5	5	14.5	165	2500	220
A-KF(ZN)2Y (1x)10x5x4	200	4	5	10	18.5	250	2500	300
A-KF(ZN)2Y (6x)5x5x4	600	4	5	6x5	34	900	9000	480
A-KF(ZN)2Y (5x)5x5x8	1000	8	5	5x5	38.5	1200	12000	770

Max. attenuation values in the cable: 0.40 dB/km at 1310 nm and 0.25 dB/km at 1550 nm.
Other attenuation values, numbers of fibers and cable constructions on request.

Fiber optic buried cable

slotted core design, fiber ribbon technology,
corrugated steel tape, inner jacket



Applications

- Direct burial
- Where there are particularly high mechanical loads
- In areas with rodents

Special features

- Fiber ribbon technology
- Slotted core construction
- Corrugated steel tape as protection against rodents and mechanical damage
- Particularly robust cables

Temperature range

- Laying and installation –5°C to 50°C
- Operation –30°C to 60°C
- Transport and storage –30°C to 70°C

Test procedures to IEC 60793-1, 60794-1-2

- Tensile strength
- Impact resistance
- Crush resistance
- Bending characteristics
- Temperature cycling
- Water penetration

Ordering data

Type designation	No. of fibers	Fibers per fiber ribbon	No. of fiber ribbons per slot	No. of slots	Outer Ø (mm)	Net weight (kg/km)	Max. tensile load during install. (N)	Min. bending radius during install. (mm)
A-KF2Y(ZN)(SR)2Y (1x)1x1x4	4	4	1	2	13.0	170	3000	260
A-KF2Y(ZN)(SR)2Y (1x)2x1x4	8	4	2	2	13.0	170	3000	260
A-KF2Y(ZN)(SR)2Y (1x)5x1x4	20	4	1	5	14.5	215	3000	290
A-KF2Y(ZN)(SR)2Y (1x)5x2x4	40	4	2	5	17.5	300	3000	350
A-KF2Y(ZN)(SR)2Y (1x)5x4x4	80	4	4	5	17.5	300	3000	350
A-KF2Y(ZN)(SR)2Y (1x)5x5x4	100	4	5	5	17.5	300	3000	350
A-KF2Y(ZN)(SR)2Y (1x)10x5x4	200	4	5	10	22.0	500	5000	440
A-KF2Y(ZN)(SR)2Y (6x)5x5x4	600	4	5	6x5	39.5	1300	13000	800

Max. attenuation values in the cable: 0.40 dB/km at 1310 nm and 0.25 dB/km at 1550 nm.

Other attenuation values, numbers of fibers and cable constructions on request.