

GigaLine® – enhanced fibre optic technology

The increasing degree of automation in industry and the rising information density in office communication make increasing demands on the transmission of analog and digital data. Conventional links based on copper cables are now often reaching the limits of their capacity. The problems caused by electromagnetic effects, differences in potential and operation in explosive environments require technical and economical solutions.

The use of GigaLine® fibre optic cables solves these problems more reliably than the use of conventional copper cables.

The special advantages of GigaLine® fibre optic cables make them suitable in the following cases:

- When electromagnetic effects can occur
- When reliable potential separation is required
- When low attenuation and thus long channels are necessary
- When crosstalk must not occur.
- When sparks must not form (for explosive environments)
- When low weight and small dimensions are an advantage
- When increase security against tapping is required

KERPEN GigaLine® means a comprehensive delivery program for fibre optic cables for virtually all applications.

Besides easy-to-assemble internal cables with compact wire technology for the patch and floor area, universal cables for the backbone indoors and outdoors and the classical outdoor cables for LAN/MAN and WAN, KERPEN offers manufacturing options for a large number of additional designs such as GigaLine® outdoor cables with a corrugated steel sheath, a steel band or SWA armour or with an additional lead covering as a protection against chemicals.

Gigabit and 10Gigabit Ethernet: new demands on the quality of the fibre optic cabling

Improved multimode fibres for Gigabit Ethernet ("OM2e")

Gigabit Ethernet in the backbone of structured in-house cabling is now often a reality or is soon to be implemented. The corresponding standard IEEE 802.3z was made official as early as July 1998.

As a consequence of the requirements this entails, since the beginning of this year GigaLine® has been delivered with improved multimode fibres. The process used to manufacture the fibres has been optimised in such a way that the profile of the multimode fibre is extremely precise and disturbances in the fibre core are virtually eliminated. As differential mode delay does not occur under these circumstances, mode-conditioning patch cords are not necessary.

For more than five years now, the standard versions of GigaLine® fibre optic cables with an improved multimode fibre G50/125 have provided bandwidth/distance products of 600 MHz x km in the first window and 1,200 MHz x km in the second window as well as Gigabit Ethernet segment lengths of 750/2,000 m.

Improved multimode fibres for 10 Gigabit Ethernet (OM3, "OM3e")

Just a few months after publication of this standard, IEEE started work on the next stage of development with a higher speed: 10 Gigabit Ethernet.

The draft of this new 10 Gigabit Ethernet standard was ratified as early as June 2002. The official standard was also published by the IEEE in autumn 2002.

The development of a 50 µm multimode fibre for 10 GbE applications up to 300 m and optimised for 850 nm lasers was also successful. This type of fibre was not only given a standard of its own (OM3) in the 2nd Edition of the cabling standard EN 50173 – it was also included in the GigaLine® product program as early as spring 2002.

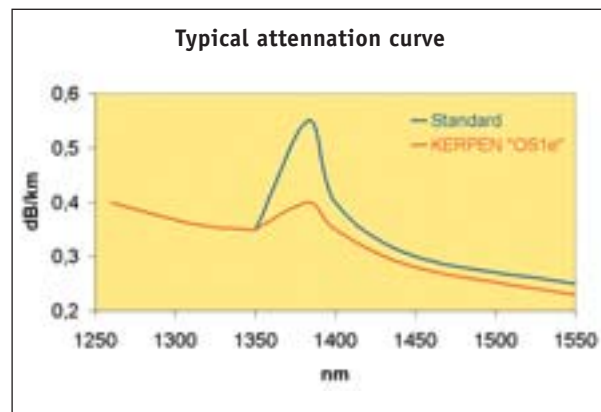
However, development continues even with the newly developed OM3 fibre. In many cases, the distances to be bridged in the backbone exceed the 300 m possible with a standard OM3 fibre. For this field of application, KERPEN has been offering GigaLine® fibre optic cables with further improved "OM3e" fibres since November 2002. These fibres offer optimum conditions for transmitting 10 GbE at segment lengths of up to 550 m. This allows the economical implementation of 10 GbE in the backbone of a building in virtually all possible cases.

Improved single-mode fibres for increased transmission capacity ("OS1e"/OS2)

In order to bridge even longer distances, since November 2003 KERPEN has complemented the GigaLine® fibre optic cables with high-quality multimode fibres of the categories "OM2e", OM3 and "OM3e" by also offering GigaLine® cables with improved single-mode fibres of the category "OS1e".

Besides the maximum possible 10 Gigabit Ethernet segment lengths of 10 / 40 km, KERPEN GigaLine® cables with "OS1e" fibres also offer an increased transmission capacity via a higher maximum degree of utilisation of the fibre.

This higher maximum degree of utilisation of the "OS1e" fibre is achieved by reducing the OH peak usual for single-mode fibres up to now, an attenuation peak at 1,383 nm.



These fibres allow the use of CWDM (Coarse Wavelength Division Multiplex), a method for the parallel transmission of different wavelengths with a channel separation of 20 nm in the so-called E band (1,360 – 1,460 nm).

The minimum demands made on these improved single-mode fibres with a reduced OH peak are defined in IEC 60793-2-50 B1.3 / ITU G.652.C/G.652.D (International Telecommunication Union). Among other requirements, the fibre attenuation must be < 0.4 dB/km over the entire wavelength range.

With attenuation values of 0.36 dB/km at 1,310 nm and 0.22 dB/km at 1550 nm, KERPEN GigaLine® cables with "OS1e" fibres are far below these maximum values. Thus, at 1550 nm these fibres also provide a more than 10 % longer range than the standard fibres used up to now.

Even today, the KERPEN "OS1e" fibre quality meets the requirements discussed in the draft standards prEN50173 for the future definition of an OS2 fibre.

Conclusion:

The control of the data flows of the future therefore requires maximum care in the planning and execution of the passive network infrastructure. One important aspect here is the selection of the suitable fibre type and quality!

Comparison of the transmission characteristics of KERPEN GigaLine® with the requirements of the standard:

Comparison between fibre category OM1 and KERPEN GigaLine® G62.5/125 "OM1e"

	850 nm		1,300/1310 nm	
	Requirements of standard	KERPEN GigaLine®	Requirements of standard	KERPEN GigaLine®
Attenuation	3.5 dB/km	3.0 dB/km	1.5 dB/km	0.7 dB/km
Bandwidth/length product	200 MHz x km	250 MHz x km	500 MHz x km	800 MHz x km
Gigabit Ethernet segment length	275 m	500 m	550 m	1,000 m
10 Gigabit Ethernet segment length	33 m	65 m	300 m	450 m

Comparison between fibre category OM2 and KERPEN GigaLine® G50/125 "OM2e"

	850 nm		1,300/1310 nm	
	Requirements of standard	KERPEN GigaLine®	Requirements of standard	KERPEN GigaLine®
Attenuation	3.5 dB/km	2.5 dB/km	1.5 dB/km	0.7 dB/km
Bandwidth/length product	500 MHz x km	600 MHz x km	500 MHz x km	1,200 MHz x km
Gigabit Ethernet segment length	550 m	750 m	550 m	2,000 m
10 Gigabit Ethernet segment length	82 m	110 m	300 m	900 m

Comparison between fibre category OM3 and KERPEN GigaLine® G50/125 "OM3"

	850 nm		1,300/1310 nm	
	Requirements of standard	KERPEN GigaLine®	Requirements of standard	KERPEN GigaLine®
Attenuation	3.5 dB/km	2.5 dB/km	1.5 dB/km	0.7 dB/km
Bandwidth/length product	1,500 MHz x km	1,500 MHz x km	500 MHz x km	500 MHz x km
Laser bandwidth	2,000 MHz x km	2,000 MHz x km		
Gigabit Ethernet segment length	550 m	900 m	550 m	550 m
10 Gigabit Ethernet segment length	300 m	300 m	300 m	300 m

Comparison between fibre category OM3 and KERPEN GigaLine® G50/125 "OM3e"

	850 nm		1,300/1310 nm	
	Requirements of standard	KERPEN GigaLine®	Requirements of standard	KERPEN GigaLine®
Attenuation	3.5 dB/km	2.5 dB/km	1.5 dB/km	0.7 dB/km
Bandwidth/length product	1,500 MHz x km	3,500 MHz x km	500 MHz x km	500 MHz x km
Laser bandwidth	2,000 MHz x km	4,700 MHz x km		
Gigabit Ethernet segment length	550 m	1,000 m	550 m	550 m
10 Gigabit Ethernet segment length	300 m	550 m	300 m	300 m

Comparison between fibre category OS1 and KERPEN GigaLine® E9...10/125 "OS1e"

	1310 nm		1550 nm	
	Requirements of standard	KERPEN GigaLine®	Requirements of standard	KERPEN GigaLine®
Attenuation	1.0 dB/km	0.36 dB/km	1.0 dB/km	0.22 dB/km
Attenuation at 1383 nm	not defined	≤ 0.4 dB/km		
10 Gigabit Ethernet segment length	10,000 m	10,000 m	40,000 m	40,000 m

GigaLine® Fibre optic indoor cables

GigaLine® DX 100, 500, 625

GigaLine® DX0 100, 500, 625

GigaLine® AT 100, 500, 625

GigaLine® M 100, 500, 625



Easy plug assembly and good splicing behaviour are the characteristics of GigaLine® indoor cables.

In the standard version, all designs of indoor cables are supplied with a halogen-free outer sheath compound.

GigaLine® indoor cables are flame-retardant according to IEC 60332-1-2 and usually also according to IEC 60332-3-24.

They also have the following characteristics:

- High flexibility
- Excellent resistance to transverse and longitudinal stress and to thermal stress
- High tensile strength

GigaLine® DX 100

GigaLine® DX 500

GigaLine® DX 625



Fibre optic indoor cables (duplex figure 8)
KL-J-V(ZN)H 2G/E ...

Structure:

Two compact wires in a figure 8 sheath with a separator and strain relief.

Sheath: halogen-free compound

Field of application:

Work area/patch cords, suitable for direct plug mounting and splicing

Dimensions	Outer Ø	Weight	Tensile strength	Transverse compression strength		Fire load		Article number	Sheath colour
				permanent N/cm (approx.)	short-term N/cm (approx.)	MJ/m (approx.)	kWh/m (approx.)		
2 G50/125	2.8x5.6 (approx.)	18 (approx.)	500 (2x250) (approx.)	50 (approx.)	100 (approx.)	0.36 (approx.)	0.10 (approx.)	8DA20003	orange
2 G50/125 OM3	2.8x5.6	18	500 (2x250)	50	100	0.36	0.10	8DA50003	orange
2 G62.5/125	2.8x5.6	18	500 (2x250)	50	100	0.36	0.10	8DB70003	orange
2 E9...10/125	2.8x5.6	18	500 (2x250)	50	100	0.36	0.10	8DC72001	yellow

GigaLine® DX0 100

GigaLine® DX0 500

GigaLine® DX0 625



Fibre optic indoor cables (duplex figure 0)
KL-J-V(ZN)H 2G/E ...

Structure:

Two individual cables with strain relief (Ø 2.1 mm; compact wires in inner sheath) in parallel under an outer sheath.

Sheath: halogen-free compound

Field of application:

Floor cabling, suitable for direct plug mounting and splicing

Dimensions	Outer Ø	Weight	Tensile strength	Transverse compression strength		Fire load		Article number	Sheath colour
				permanent N/cm (approx.)	short-term N/cm (approx.)	MJ/m (approx.)	kWh/m (approx.)		
2 G50/125	3.1x5.2	17	600 (2x300)	50	100	0.39	0.11	8DA20011	orange
2 G50/125 OM3	3.1x5.2	17	600 (2x300)	50	100	0.39	0.11	8DA50011	orange
2 G62.5/125	3.1x5.2	17	600 (2x300)	50	100	0.39	0.11	8DB70011	orange
2 E9...10/125	3.1x5.2	17	600 (2x300)	50	100	0.39	0.11	8DC70010	yellow

GigaLine® AT 100
GigaLine® AT 500
GigaLine® AT 625



Fibre optic indoor cables, splittable (breakout cables)
KL-AT-V(ZN)HH n G/E ...

Structure:

Up to 12 individual cables with strain relief (Ø 2.1 mm; compact wires in inner sheath) stranded under an outer sheath. Sheath: halogen-free compound, colour: yellow

Field of application:

Floor cabling, suitable for direct plug mounting and splicing

Dimensions	Outer ø	Weight	Tensile strength	Transverse compression strength		Fire load		Article number			
				permanent N/cm (max.)	short-term N/cm (max.)	MJ/m (approx.)	kWh/m (approx.)	G 50/125	G 50/125 OM3	G 62.5/125	E 9...10/125
4 G/E	7.0	46	1,200	50	100	1.00	0.28	8BA20002	8BA50002	8BB70002	8BC70002
6 G/E	8.2	66	1,800	50	100	1.60	0.44	8BA20003	8BA50003	8BB70003	8BC70003
8 G/E	9.6	83	2,400	50	100	2.25	0.63	8BA20004	8BA50004	8BB70004	8BC70004
10 G/E	11.2	113	3,000	50	100	2.75	0.76	8BA20005	8BA50005	8BB70005	8BC70005
12 G/E	12.4	135	3,600	50	100	3.05	0.85	8BA20006	8BA50006	8BB70006	8BC70006

GigaLine® M 100
GigaLine® M 500
GigaLine® M 625



Fibre optic indoor cables, (multi)
KL-J-V(ZN)H n G/E ...

Structure:

Up to 12 individual cables stranded under an outer sheath, with common strain relief.
Sheath: halogen-free compound, colour: yellow

Field of application:

Floor cabling, suitable for direct plug mounting and splicing.

Dimensions	Outer ø	Weight	Tensile strength	Transverse compression strength		Fire load		Article number			
				permanent N/cm (max.)	short-term N/cm (max.)	MJ/m (approx.)	kWh/m (approx.)	G 50/125	G 50/125 OM3	G 62.5/125	E 9...10/125
4 G/E	5.2	24	400	50	100	0.45	0.13	8MA20002	8MA50002	8MB70002	8MC70002
6 G/E	5.8	28	600	50	100	0.50	0.15	8MA20003	8MA50003	8MB70003	8MC70003
8 G/E	5.8	30	600	50	100	0.55	0.17	8MA20004	8MA50004	8MB70004	8MC70004
10 G/E	6.3	34	800	50	100	0.60	0.18	8MA20005	8MA50005	8MB70005	8MC70005
12 G/E	6.3	37	800	50	100	0.65	0.19	8MA20006	8MA50006	8MB70006	8MC70006

GigaLine® Fibre optic universal cables

GigaLine® DQ 100, 500, 625 U

GigaLine® universal cables can be used for house lead-ins without additional transfer points:
universal ... and they cut costs.

GigaLine® universal cables can be used outdoors and indoors, especially in the case of increased mechanical requirements.

Equipped with a metal-free rodent protection made of glass fibres.

Another guarantee of safety: flame-retardant according to IEC 60332-3-24.



GigaLine® DQ 100, 500, 625 Uc

In addition to the features listed above, this version is suitable for direct underground installation.

GigaLine® DQ 500 Uc



Fibre optic universal cable, longitudinally watertight, with metal-free rodent protection
KL-U-DQ(ZNS)Hc n x m G50/125 "OM3e"

Structure:

Filled loose tube, central or stranded, water blocking tape, metal-free rodent protection.
Sheath: halogen-free compound, UV-resistant
Colour: black – RAL 9005

Field of application:

Campus/backbone cabling, suitable for splicing, indoor installation in the case of increased mechanical requirements and danger through rodents, outdoor installation in dry tubes or directly in the ground, house lead-ins possible without additional transfer points (splices).

Dimensions	Outer ø	Weight	Tensile strength	Transverse compression strength		Fire load		Article number
				permanent N/cm	short-term N/cm	MJ/m	kWh/m	
	mm	kg/km	N					G 50/125 "OM3e"
1 x 12	7.9	64	2500	200	500	1.15	0.35	8LA70006
1 x 24	8.5	70	2500	200	500	1.35	0.40	8LA70009
4 x 12	13.1	160	6000	200	500	2.90	0.80	8LA70N08

GigaLine® DQ 100 U
GigaLine® DQ 500 U
GigaLine® DQ 625 U



Fibre optic universal cable, longitudinally watertight,
with non-metallic rodent protection
KL-U-DQ(ZNS)H n x m G/E ...

Structure:

Filled loose tube, central or stranded, water blocking
tape, non-metallic rodent protection.
Sheath: halogen-free compound, colour: yellow

Field of application:

Campus/backbone cabling, suitable for splicing, indoor
installation in the case of increased mechanical
requirements and danger through rodents, outdoor
installation in dry tubes, house lead-ins possible with-
out additional transfer points (splices).

Dimen- sions	Outer ø mm (approx.)	Weight kg/km (approx.)	Tensile strength N (approx.)	Transverse compression strength		Fire load		Article number			
				permanent N/cm (max.)	short-term N/cm (max.)	MJ/m (approx.)	kWh/m (approx.)	G 50/125	G 50/125 OM3	G 62.5/125	E 9...10/125
1 x 2	9.2	85	2500	200	500	1.00	0.30	8UA20001	8UA50001	8UB70001	8UC70001
1 x 4	9.2	85	2500	200	500	1.00	0.30	8UA20002	8UA50002	8UB70002	8UC70002
1 x 6	9.2	85	2500	200	500	1.00	0.30	8UA20003	8UA50003	8UB70003	8UC70003
1 x 8	9.2	85	2500	200	500	1.00	0.30	8UA20004	8UA50004	8UB70004	8UC70004
1 x 10	9.2	85	2500	200	500	1.00	0.30	8UA20005	8UA50005	8UB70005	8UC70005
1 x 12	9.2	85	2500	200	500	1.00	0.30	8UA20006	8UA50006	8UB70006	8UC70006
1 x 16	9.7	90	2500	200	500	1.10	0.32	8UA20007	8UA50007	8UB70007	8UC70007
1 x 20	9.7	90	2500	200	500	1.10	0.32	8UA20008	8UA50008	8UB70008	8UC70008
1 x 24	9.7	90	2500	200	500	1.10	0.32	8UA20009	8UA50009	8UB70009	8UC70009
2 x 8	13.1	175	6000	200	500	2.84	0.79	8UA20N01	8UA50N01	8UB70N01	8UC70N01
2 x 10	13.1	175	6000	200	500	2.84	0.79	8UA20N02	8UA50N02	8UB70N02	8UC70N02
3 x 10	13.1	175	6000	200	500	2.84	0.79	8UA20N03	8UA50N03	8UB70N03	8UC70N03
4 x 10	13.1	175	6000	200	500	2.84	0.79	8UA20N04	8UA50N04	8UB70N04	8UC70N04
5 x 10	13.1	175	6000	200	500	2.84	0.79	8UA20N05	8UA50N05	8UB70N05	8UC70N05
2 x 12	13.1	175	6000	200	500	2.84	0.79	8UA20N06	8UA50N06	8UB70N06	8UC70N06
3 x 12	13.1	175	6000	200	500	2.84	0.79	8UA20N07	8UA50N07	8UB70N07	8UC70N07
4 x 12	13.1	175	6000	200	500	2.84	0.79	8UA20N08	8UA50N08	8UB70N08	8UC70N08
5 x 12	13.1	175	6000	200	500	2.84	0.79	8UA20N09	8UA50N09	8UB70N09	8UC70N09
6 x 12	15.4	225	6000	200	500	4.10	1.14	8UA20N10	8UA50N10	8UB70N10	8UC70N10
8 x 12	15.4	225	6000	200	500	4.10	1.14	8UA20N11	8UA50N11	8UB70N11	8UC70N11
10 x 12	16.9	265	6000	200	500	5.14	1.43	8UA20N12	8UA50N12	8UB70N12	8UC70N12
12 x 12	18.7	320	6000	200	500	6.20	1.72	8UA20N13	8UA50N13	8UB70N13	8UC70N13

GigaLine® Fibre optic outdoor cables

GigaLine® DQ 100, 500, 625 N
GigaLine® DQ 100, 500, 625 SR



Excellent performance, robust design but still easy to handle: these are the features of GigaLine® outdoor cables.

GigaLine® outdoor cables were designed for use in city networks and industrial plants and in the campus and backbone area of LAN cabling and meet all demands made on transmission and installation conditions.

Besides the designs with non-metallic rodent protection, the GigaLine® product range also includes versions with a corrugated steel armour.

If neither rodent protection nor mechanical protection are required, there are versions with a simple non-metallic strain relief, alternatively with an easy-to-assemble dry twisted structure or a classical petrolate filling, the latter optionally with a layered sheath as a perfect protection from humidity.

A wide range of additional designs can also be manufactured, for example GigaLine® outdoor cables with steel band or SWA armour or with an additional lead covering as a protection against chemicals.

GigaLine® DQ 100 N
GigaLine® DQ 500 N
GigaLine® DQ 625 N



Fibre optic outdoor cable, longitudinally watertight,
with non-metallic rodent protection
KL-A-DQ(ZNS)2Y n x m G/E ...

Structure:

Filled loose tube, central or stranded, water blocking
tape, non-metallic rodent protection.
Sheath: PE, colour: black, UV-resistant

Field of application:

Outdoor cable for direct ground burial or in tubes,
for MAN (city networks) and LAN (campus/backbone),
suitable for splicing.

Dimensions	Outer ø mm (approx.)	Weight kg/km (approx.)	Tensile strength N (max.)	Transverse compression strength		Fire load		Article number			
				permanent N/cm (max.)	short-term N/cm (max.)	MJ/m (approx.)	kWh/m (approx.)	G 50/125	G 50/125 OM3	G 62,5/125	E 9...10/125
1 x 2	7.9	55	2,500	200	500	1.35	0.38	8AA20001	8AA50001	8AB70001	8AC70001
1 x 4	7.9	55	2,500	200	500	1.35	0.38	8AA20002	8AA50002	8AB70002	8AC70002
1 x 6	7.9	55	2,500	200	500	1.35	0.38	8AA20003	8AA50003	8AB70003	8AC70003
1 x 8	7.9	55	2,500	200	500	1.35	0.38	8AA20004	8AA50004	8AB70004	8AC70004
1 x 10	7.9	55	2,500	200	500	1.35	0.38	8AA20005	8AA50005	8AB70005	8AC70005
1 x 12	7.9	55	2,500	200	500	1.35	0.38	8AA20006	8AA50006	8AB70006	8AC70006
1 x 16	8.5	60	2,500	200	500	1.70	0.47	8AA20007	8AA50007	8AB70007	8AC70007
1 x 20	8.5	60	2,500	200	500	1.70	0.47	8AA20008	8AA50008	8AB70008	8AC70008
1 x 24	8.5	60	2,500	200	500	1.70	0.47	8AA20009	8AA50009	8AB70009	8AC70009
2 x 8	13.1	140	6,000	200	500	4.13	1.15	8AA20N01	8AA50N01	8AB70N01	8AC70N01
2 x 10	13.1	140	6,000	200	500	4.13	1.15	8AA20N02	8AA50N02	8AB70N02	8AC70N02
3 x 10	13.1	140	6,000	200	500	4.13	1.15	8AA20N03	8AA50N03	8AB70N03	8AC70N03
4 x 10	13.1	140	6,000	200	500	4.13	1.15	8AA20N04	8AA50N04	8AB70N04	8AC70N04
5 x 10	13.1	140	6,000	200	500	4.13	1.15	8AA20N05	8AA50N05	8AB70N05	8AC70N05
2 x 12	13.1	140	6,000	200	500	4.13	1.15	8AA20N06	8AA50N06	8AB70N06	8AC70N06
3 x 12	13.1	140	6,000	200	500	4.13	1.15	8AA20N07	8AA50N07	8AB70N07	8AC70N07
4 x 12	13.1	140	6,000	200	500	4.13	1.15	8AA20N08	8AA50N08	8AB70N08	8AC70N08
5 x 12	13.1	140	6,000	200	500	4.13	1.15	8AA20N09	8AA50N09	8AB70N09	8AC70N09
6 x 12	15.4	178	6,000	200	500	5.73	1.59	8AA20N10	8AA50N10	8AB70N10	8AC70N10
8 x 12	15.4	178	6,000	200	500	5.73	1.59	8AA20N11	8AA50N11	8AB70N11	8AC70N11
10 x 12	16.9	211	6,000	200	500	6.87	1.91	8AA20N12	8AA50N12	8AB70N12	8AC70N12
12 x 12	18.7	262	6,000	200	500	8.15	2.26	8AA20N13	8AA50N13	8AB70N13	8AC70N13

GigaLine® DQ 100 SR
 GigaLine® DQ 500 SR
 GigaLine® DQ 625 SR



Fibre optic outdoor cable, longitudinally watertight,
 armoured with corrugated steel sheath
 KL-A-DQ(ZN)2Y(SR)2Y n x m G/E ...

Structure:

Filled loose tube, central or stranded, water blocking
 tape, strain relief
 Inner sheath: PE, armour: corrugated steel sheath
 Outer sheath: PE, colour: black, UV-resistant

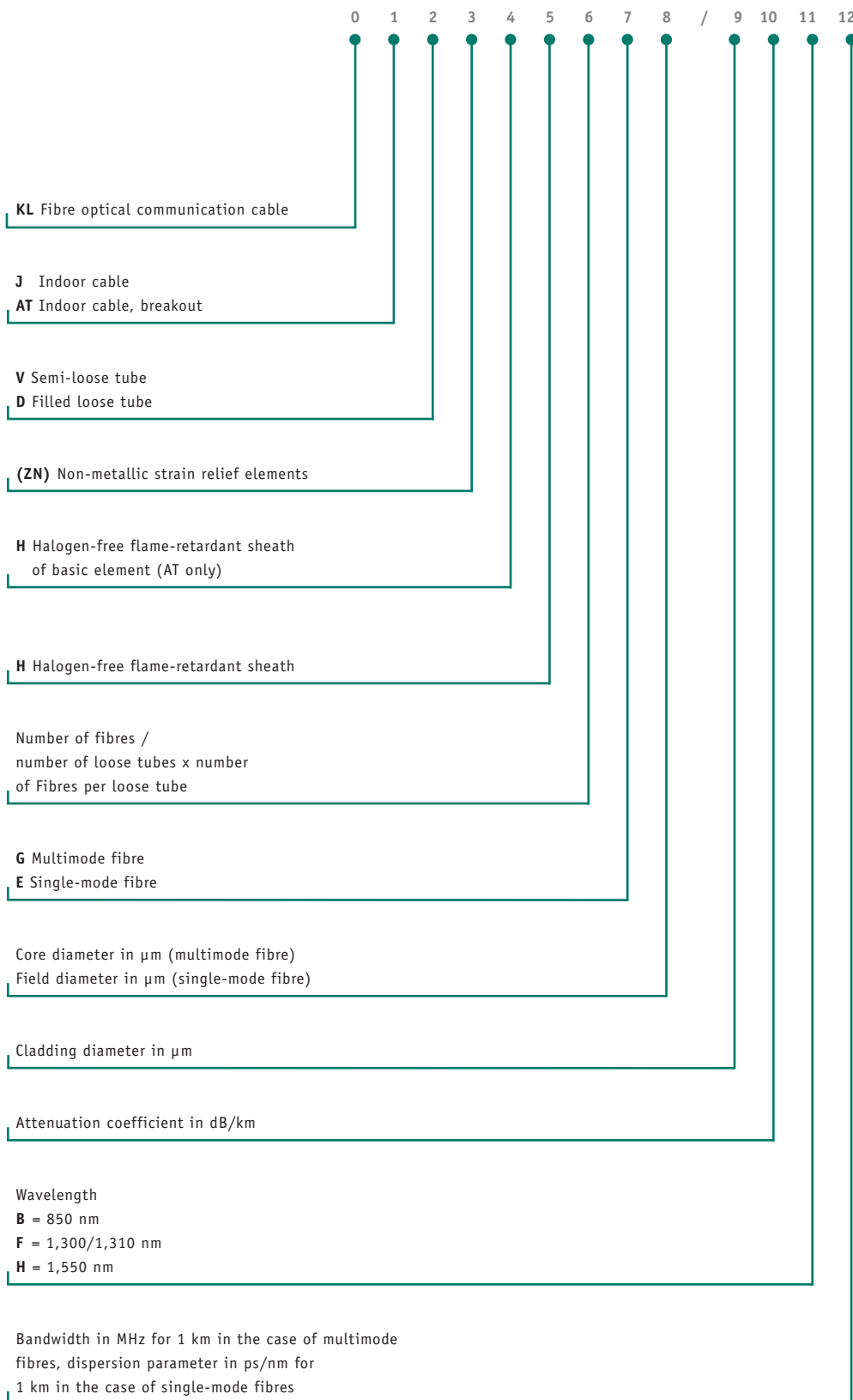
Field of application:

Outdoor cable for installing direct ground burial or in
 tubes, for MAN (city networks) and LAN (campus/back-
 bone), suitable for splicing.

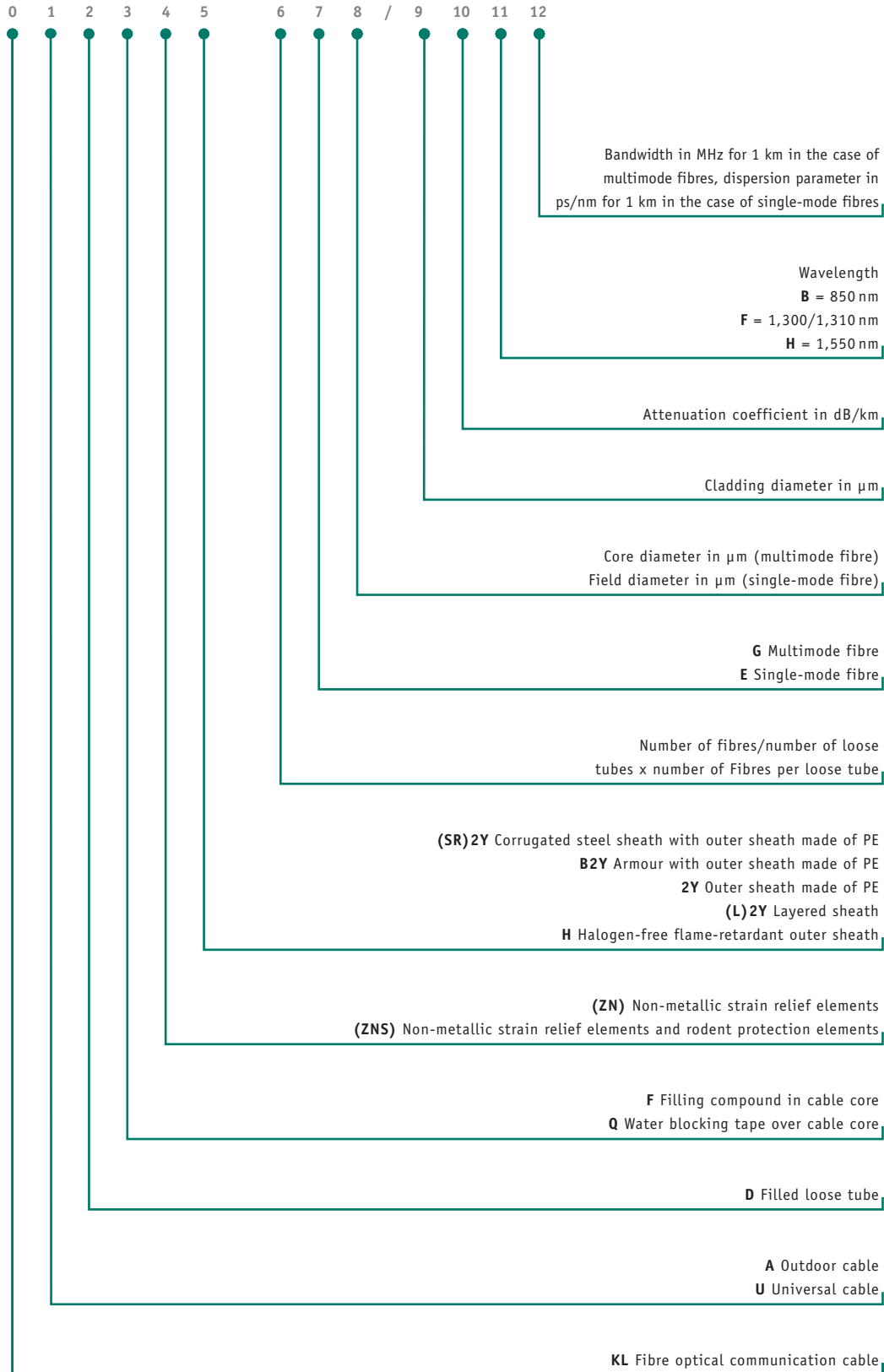
Dimens-ions	Outer ø	Weight	Tensile strength	Transverse compression strength		Article number			
				permanent N/cm (max.)	short-term N/cm (max.)	G 50/125	G 50/125 OM3	G 62,5/125	E 9...10/125
	mm (approx.)	kg/km (approx.)	N (max.)						
1 x 2	12,5	135	1,000	100	300	8AA20041	8AA50041	8AB70041	8AC70041
1 x 4	12,5	135	1,000	100	300	8AA20042	8AA50042	8AB70042	8AC70042
1 x 6	12,5	135	1,000	100	300	8AA20043	8AA50043	8AB70043	8AC70043
1 x 8	12,5	135	1,000	100	300	8AA20044	8AA50044	8AB70044	8AC70044
1 x 10	12,5	135	1,000	100	300	8AA20045	8AA50045	8AB70045	8AC70045
1 x 12	12,5	135	1,000	100	300	8AA20046	8AA50046	8AB70046	8AC70046
1 x 16	13,0	140	1,000	100	300	8AA20047	8AA50047	8AB70047	8AC70047
1 x 20	13,0	140	1,000	100	300	8AA20048	8AA50048	8AB70048	8AC70048
1 x 24	13,0	140	1,000	100	300	8AA20049	8AA50049	8AB70049	8AC70049
2 x 8	18,5	270	2,500	100	300	8AA20901	8AA50901	8AB70901	8AC70901
2 x 10	18,5	270	2,500	100	300	8AA20902	8AA50902	8AB70902	8AC70902
3 x 10	18,5	270	2,500	100	300	8AA20903	8AA50903	8AB70903	8AC70903
4 x 10	18,5	270	2,500	100	300	8AA20904	8AA50904	8AB70904	8AC70904
5 x 10	18,5	270	2,500	100	300	8AA20905	8AA50905	8AB70905	8AC70905
2 x 12	18,5	270	2,500	100	300	8AA20906	8AA50906	8AB70906	8AC70906
3 x 12	18,5	270	2,500	100	300	8AA20907	8AA50907	8AB70907	8AC70907
4 x 12	18,5	270	2,500	100	300	8AA20908	8AA50908	8AB70908	8AC70908
5 x 12	18,5	270	2,500	100	300	8AA20909	8AA50909	8AB70909	8AC70909
6 x 12	22,0	365	3,000	100	300	8AA20910	8AA50910	8AB70910	8AC70910
8 x 12	22,0	365	3,000	100	300	8AA20911	8AA50911	8AB70911	8AC70911
10 x 12	23,5	440	4,000	100	300	8AA20912	8AA50912	8AB70912	8AC70912
12 x 12	27,0	545	5,000	100	300	8AA20913	8AA50913	8AB70913	8AC70913

GigaLine® abbreviations – for easy identification of the structural elements to be found in fibre optic cables

Indoor fibre optical cable



Universal fibre optic/outdoor cables



GigaLine® Fibre qualities

	G50/125 "OM2e"	G50/125 "OM3"	G 50/115 "OM3e"	G62.5/125 "OM1e"	E9...10/12 "OS1e"
Attenuation coefficient					
at 850 nm:	max. 2.5 dB/km	max. 2.5 dB/km	max. 2.5 dB/km	max. 3.0 dB/km	
at 1,300 nm:	max. 0.7 dB/km	max. 0.7 dB/km	max. 0.7 dB/km	max. 0.7 dB/km	
at 1,310 nm:					max. 0.36 dB/km
at 1,383 nm:					max. 0.40 dB/km
at 1,550 nm:					max. 0.22 dB/km
Bandwidth					
at 850 nm:	min. 600 MHz x km	min. 1,500 MHz x km	min. 3,500 MHz x km	min. 250 MHz x km	
at 1,300 nm:	min. 1,200 MHz x km	min. 500 MHz x km	min. 500 MHz x km	min. 800 MHz x km	
Laser bandwidth					
at 850 nm:		min. 2,000 MHz x km	min. 4,700 MHz x km		
Dispersion					
at 1,310 nm:					max. 3.5 ps/nm x km
at 1,550 nm:					max. 18 ps/nm x km
Segment length at Gigabit Ethernet					
at 850 nm (1,000BASE-SX):	min. 750 m	min. 900 m	min. 1,000 m	min. 500 m	
at 1,300 nm (1,000BASE-LX):	2,000 m min.	min. 550 m	min. 550 m	min. 1,000 m	
Segment length at 10 Gigabit Ethernet					
at 850 nm (10GBASE-SR):	min. 110 m	min. 300 m	min. 550 m	min. 65 m	
at 1,300 nm (10GBASE-LX4):	min. 900 m	min. 300 m	min. 300 m	min. 450 m	min. 10,000
Numerical aperture	Nominal value 0.20	Nominal value 0.20	Nominal value 0.20	Nominal value 0.275	Nominal value 0.12
Refraction index					
at 850 nm:	Nominal value 1.482	Nominal value 1.482	Nominal value 1.482	Nominal value 1.496	
at 1,300 nm:	Nominal value 1.477	Nominal value 1.477	Nominal value 1.482	Nominal value 1.491	
at 1,310 nm:					Nominal value 1.4675
at 1,550 nm:					Nominal value 1.4681
Test load	100 kpsi	100 kpsi	100 kpsi	100 kpsi	100 kpsi

Other Fibre qualities on request

GigaLine® colour codes

Wires (in the case of stranded loose tubes)

Counting wire	red
Other wires	green for G50/125 blue for G62.5/125 yellow for E9...10/125
Dummy elements	natural colour

The wires are counted consecutively starting with the wire adjacent to the counting element. Dummy elements are not included in counting.

Fibres (in the case of loose tubes)

Fibre no.	Colour
1	red
2	green
3	blue
4	yellow
5	white
6	grey
7	brown
8	violet
9	turquoise
10	black
11	orange
12	pink
13	red-black
14	green-black
15	blue-black
16	yellow-black
17	white-black
18	grey-black
19	brown-black
20	violet-black
21	turquoise-black
22	natural-black
23	orange-black
24	pink-black