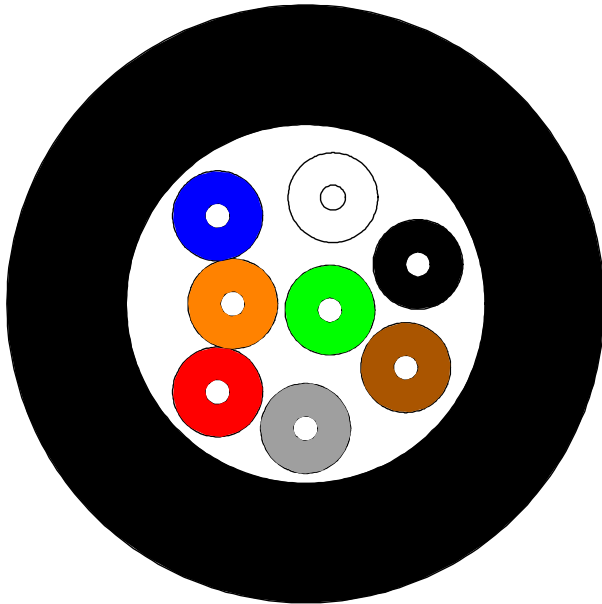


## Draka black distribution cable

**Universal indoor/outdoor distribution or mini break-out cable with ES9 tight buffer, 2 – 24 fibres and black FireBur<sup>®</sup> sheath, VDE: U-V(ZN)H**



### Application and Installation

This distribution or mini-break-out cable can be used for many indoor applications and outdoor applications

The cable features our new and improved **ES9** tight buffer.

Typical cable applications include: LAN and WAN backbones, central office interconnections, backbones in data centres, and many other.

The cable is suited for installation in ducts and on trays.

The cable features an UV stabilised, water and moisture resistant FireBur<sup>®</sup> sheathing, the cable is thus well suited for outdoor runs; but is not longitudinal water blocked.

### Standards

ISO 11801 2<sup>nd</sup> edition, EN 187 000, IEC 60794-2, EN 50 173-1, IEC 60794-2-20

### Flame resistance

LSHF (FRNC): IEC 60332-1-2; IEC 60754-2; IEC 61034

# Draka black distribution cable

## Construction

Fibre	2 - 24 tightly buffered fibres 900 $\mu\text{m} \pm 50 \mu\text{m}$ .		
Fibre colour code	1 Red	13 Yellow w/mark every 70 mm	
	2 Green	14 White w/mark every 70 mm	
	3 Blue	15 Grey w/mark every 70 mm	
	4 Yellow	16 Turquoise w/mark every 70 mm	
	5 White	17 Orange w/mark every 70 mm	
	6 Grey	18 Pink w/mark every 70 mm	
	7 Brown	19 Yellow w/mark every 35 mm	
	8 Violet	20 White w/mark every 35 mm	
	9 Turquoise	21 Grey w/mark every 35 mm	
	10 Black	22 Turquoise w/mark every 35 mm	
	11 Orange	23 Orange w/mark every 35 mm	
	12 Pink	24 Pink w/mark every 35 mm	
Strength member	E- Glass rovings		
Sheath	Black FireBur <sup>®</sup> , halogen free, flame resistant thermoplastic sheathing compound acc. to EN 50290-2-27, UV stabilized		
Sheath marking	Draka I/O DI LSHF ES9 <Fibre count> <Fibre type><Fibre brand><Item No>05<Batch Number><Meter mark> U-V(ZN) H <Fibre count> <Fibre family> <Mode field diameter> /125 <Transmission Class>		

## Physical properties

**IEC 60794-1-2**

Attribute	Method	Limits						
Fibre count		2	4	6	8	12	16	24
Nominal diameter [mm]	-	6	6.5	6.5	7.0	7.5	8.0	8.5
Nominal weight [kg/km]	-	32	34	36	39	43	52	63
Maximum installation load (a few hours) [N]	-	1500				2100		2400
Short term tensile strength (some days) [N]	E1	1000				1400		1600
Permanent tensile strength [N]	E1	500				1000		1500
Impact [J]	E4	20 J						
Crush (compressive strength)	E3	3000 N/ 100 mm						
Torsion	E7	5 cycles $\pm$ 1 turn						
Minimum bending radius	E11	50			75		115	
Minimum bending radius under tension	E18A	100			130		230	
Temperature range	F1	Operation and Installation				-20 °C to 70 °C		
		Storage				-40 °C to 70 °C		
Minimum bending radius of the ES9 tightly buffered fibres	G01	With standard fibres				20 mm		
		With MaxCap-BB-OMx fibres				7.5 mm		
		With BendBright-XS fibers:				7.5 mm		
Heat of combustion [MJ/km] – [kW/m]		660 0.18	760 0.21	845 0.23	970 0.29	1180 0.33	1400 0.39	1700 0.47

## Draka black distribution cable

### Product codes – ordering information

Prysmian group material code	Prysmian Group material description	Draka Material code	Fibre count	Fibre type	Fibre data sheet
60019951	DR I/O DI N LSHF ES9 2 OM2B BL		2	MaxCap-BB-OM2 50/125	C34
	DR I/O DI N LSHF ES9 4 OM2B BL		4	MaxCap-BB-OM2 50/125	C34
	DR I/O DI N LSHF ES9 6 OM2B BL		6	MaxCap-BB-OM2 50/125	C34
	DR I/O DI N LSHF ES9 8 OM2B BL		8	MaxCap-BB-OM2 50/125	C34
	DR I/O DI N LSHF ES9 12 OM2B BL		12	MaxCap-BB-OM2 50/125	C34
	DR I/O DI N LSHF ES9 24 OM2B BL		24	MaxCap-BB-OM2 50/125	C34
60019530	DR I/O DI N LSHF ES9 2 OM3B BL		2	MaxCap-BB-OM3	C31
	DR I/O DI N LSHF ES9 4 OM3B BL		4	MaxCap-BB-OM3	C31
	DR I/O DI N LSHF ES9 6 OM3B BL		6	MaxCap-BB-OM3	C31
	DR I/O DI N LSHF ES9 8 OM3B BL		8	MaxCap-BB-OM3	C31
	DR I/O DI N LSHF ES9 12 OM3B BL		12	MaxCap-BB-OM3	C31
	DR I/O DI N LSHF ES9 16 OM3B BL		16	MaxCap-BB-OM3	C31
60019534	DR I/O DI N LSHF ES9 24 OM3B BL		24	MaxCap-BB-OM3	C31
60019535	DR I/O DI N LSHF ES9 4 OM4B BL		4	MaxCap-BB-OM4	C32
	DR I/O DI N LSHF ES9 6 OM4B BL		6	MaxCap-BB-OM4	C32
60019536	DR I/O DI N LSHF ES9 8 OM4B BL		8	MaxCap-BB-OM4	C32
60019538	DR I/O DI N LSHF ES9 12 OM4B BL		12	MaxCap-BB-OM4	C32
	DR I/O DI N LSHF ES9 16 OM4B BL		16	MaxCap-BB-OM4	C32
60019539	DR I/O DI N LSHF ES9 24 OM4B BL		24	MaxCap-BB-OM4	C32
	DR I/O DI N LSHF ES9 4 MM61 BK		2	OM1 62.5/125 multi mode	C02
	DR I/O DI N LSHF ES9 4 MM61 BK		4	OM1 62.5/125 multi mode	C02
	DR I/O DI N LSHF ES9 6 MM61 BK		6	OM1 62.5/125 multi mode	C02
	DR I/O DI N LSHF ES9 8 MM61 BK		8	OM1 62.5/125 multi mode	C02
	DR I/O DI N LSHF ES9 12 MM61 BK		12	OM1 62.5/125 multi mode	C02
	DR I/O DI N LSHF ES9 16 MM61 BK		16	OM1 62.5/125 multi mode	C02
	DR I/O DI N LSHF ES9 24 MM61 BK		24	OM1 62.5/125 multi mode	C02
60037923	DR I/O DI N LSHF ES9 2 SM2D BK		2	OS2 single mode	C03e
	DR I/O DI N LSHF ES9 4 SM2D BK		4	OS2 single mode	C03e
	DR I/O DI N LSHF ES9 6 SM2D BK		6	OS2 single mode	C03e
	DR I/O DI N LSHF ES9 8 SM2D BK		8	OS2 single mode	C03e
60037924	DR I/O DI N LSHF ES9 12 SM2D BK		12	OS2 single mode	C03e
	DR I/O DI N LSHF ES9 16 SM2D BK		16	OS2 single mode	C03e
	DR I/O DI N LSHF ES9 24 SM2D BK		24	OS2 single mode	C03e
60038345	DR I/O DI N LSHF ES9 4 SM7B BK		4	BendBrightXS G.657.A2	C24

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## Properties of cable with standard Enhanced SM fibre

### ESMF, low water peak single mode fibre G652D, OS2

#### General and application

The optical fibres are made of a high grade doped silica core surrounded by a silica cladding.

They are coated with a dual layer, UV cured acrylate based coating.

This enhanced single mode fibre provides improved performance across the entire 1260 nm to 1625 nm wavelength spectrum due to its low attenuation in 1383 nm, the water-peak region.

#### Standards and Norms

IEC / EN 60793-2-50 Category B.1.3	EN 50 173-1:2007, cat. OS2 and OS1
ITU-T Recommendation G.652.D and C, B, A	ISO / IEC 11801:2002, cat. OS2 and OS1
IEEE 802.3 – 2002 incl. 802.3ae	ISO / IEC 24702: 2006, cat. OS2 and OS1

#### Optical properties

Attribute	Measurement method	Units	Limits
Mode field diameter at 1310 nm	IEC/EN 60793-1-45	µm	9.0 ± 0.4
Mode field diameter at 1550 nm		µm	10.1 ± 0.5
Chromatic dispersion coefficient:	IEC/EN 60793-1-42		
In the interval 1285 nm – 1330 nm		ps/km • nm	≤  3
At 1550 nm		ps/km • nm	≤ 18.0
At 1625 nm		ps/km • nm	≤ 22.0
Zero dispersion wavelength, λ <sub>0</sub>		nm	1300 - 1322
Zero dispersion slope		ps/(nm <sup>2</sup> • km)	≤ 0.090
Cut-off wavelength	IEC/EN 60793-1-44	λ <sub>cc</sub> nm	≤ 1260 *
Polarisation mode dispersion (PMD) coefficient	IEC/EN 60793-1-48	ps/√km	≤ 0.5
PMD <sub>0</sub> Link Design Value (computed with Q=0.01%, N=20)	IEC/EN 60794-3	ps/√km	≤ 0.2

\* guaranteed value according to the ITU-T (ATM G650) method

#### Attenuation

Attribute	Measurement method	Units	Limits
Maximum attenuation value of cable in the interval 1310 nm – 1625 nm	IEC/EN 60793-1-40	dB/km	≤ 0.39
Maximum attenuation value of cable at 1550 nm	IEC/EN 60793-1-40	dB/km	≤ 0.25
Local discontinuity at 1310 and 1550 nm	IEC/EN 60793-1-40	dB	Max. 0.1

#### Attenuation variation vs Bending

Attribute	Measurement method	Units	Limits
100 turns on a R=25 mm mandrel at 1310 & 1550 nm	IEC/EN 60793-1-47	dB	≤ 0.05
100 turns on a R=30 mm mandrel at 1625 nm	IEC/EN 60793-1-47	dB	≤ 0.05

### Group index of refraction

Attribute	Measurement method	Units	Values
1310 nm	IEC/EN 60793-1-22	-	1.467
1550 nm	IEC/EN 60793-1-22	-	1.468
1625 nm	IEC/EN 60793-1-22	-	1.468

### Geometrical properties

Attribute	Measurement method	Units	Limits
Cladding diameter	IEC/EN 60793-1-20	µm	125.0 ± 0.7
Cladding non-circularity	IEC/EN 60793-1-20	%	≤ 0.7
Core (MDF) -cladding concentricity error	IEC/EN 60793-1-20	µm	≤ 0.5
Primary coating diameter – ColorLock <sup>XS</sup> and natural	IEC/EN 60793-1-21	µm	242 ± 7
Primary coating non-circularity	IEC/EN 60793-1-21	%	≤ 5
Primary coating-cladding concentricity error	IEC/EN 60793-1-21	µm	≤ 12

### Mechanical properties

Attribute	Measurement method	Units	Limits
Proof stress level	IEC/EN 60793-1-30	GPa	≥ 0.7 (≈ 1 %)
Strip force (peak)	IEC/EN 60793-1-32	N	1.2 ≤ F <sub>peak.strip</sub> ≤ 8.9
Dynamic fatigue resistance aged and unaged	IEC / EN 60793-1-33	(N <sub>d</sub> )	≥ 20
Static fatigue, aged	IEC / EN 60793-1-33	(N <sub>s</sub> )	≥ 23

*All measurements in accordance with ITU-T G650 recommendations*

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