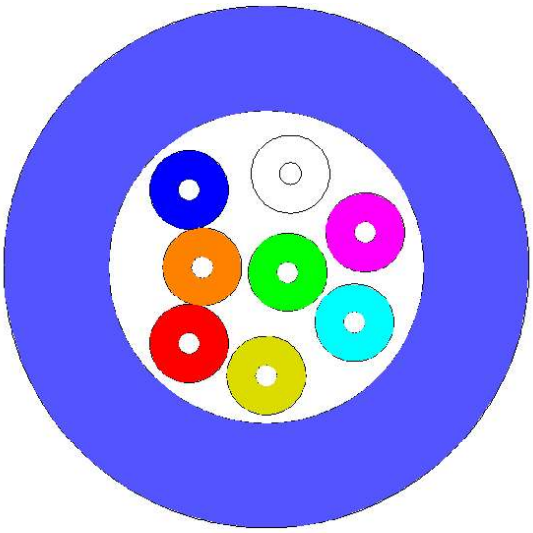
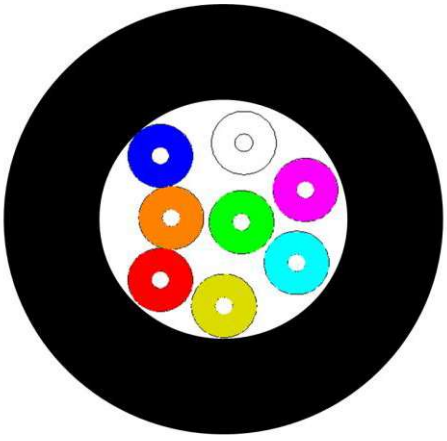
D12b: UC$^{FIBRE™}$ Universal Distribution Cable

Universal (indoor/outdoor), distribution or mini break-out cable with ES9 tight buffer, up to 24 fibres and FireBur® sheath, VDE: U-V(ZN)H





Optional Black Sheath

E_{ca} CPR

Application and Installation

This distribution or mini-break-out cable can be used for many indoor applications and outdoor applications
The cable features Draka **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® sheathing, the cable is thus well suited for outdoor runs; but is not longitudinal water blocked.

Standards

ISO 11801-1, EN 187 000, IEC 60794-2, EN 50 173-1, IEC 60794-2-20

Flame Resistance

LSHF (LSOH): IEC 60332-1-2; IEC 60754-2; IEC 61034; Class E_{ca}

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Construction

Fibre	2 - 24 tightly buffered fibres 900 µm ± 50 µm.			
Fibre colour code	1	Red	13	Red w/mark every 70mm
	2	Green	14	Green w/mark every 70mm
	3	Blue	15	Blue w/mark every 70mm
	4	Yellow	16	Yellow w/mark every 70mm
	5	White	17	White w/mark every 70mm
	6	Grey	18	Grey w/mark every 70mm
	7	Brown	19	Brown w/mark every 70mm
	8	Violet	20	Violet w/mark every 70mm
	9	Turquoise	21	Turquoise w/mark every 70mm
	10	Black	22	White w/mark every 35mm
	11	Orange	23	Orange w/mark every 70mm
	12	Pink	24	Pink w/mark every 70mm
Strength member	E- Glass rovings			
Sheath	Blue (Black optional) FireBur®, halogen free, UV stabilized			
Sheath marking	Draka UC^{FIBRE} I/O DI LSHF ES9 <Fibre count> <Fibre type><Fibre brand><Item No><Factory code><Batch Number><Meter mark> U-V(ZN) H <Fibre count> <Fibre family> <Mode field diameter> /125 <Transmission Class>			

Physical Properties

IEC 60794-1-21/22

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	8.6
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) [N / 100 mm]	E3	3000					1000	1000
Torsion	E7	5 cycles ± 1 turn						
Minimum bending radius	E11	50				75		85
Minimum bending radius under tension	E18A	100				130		170
Temperature range	F1	Operation and Installation				-20 °C to 60 °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

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Product Codes

Product Code	DoP Number*	Product Description	Fibre Count	Fibre Type	Fibre Data Sheet
60020363		UC^{FIBRE} I/O DI LSHF ES9 2 OM2B	2	MaxCap-BB-OM2	C34
60018880	1004743	UC^{FIBRE} I/O DI LSHF ES9 4 OM2B	4	MaxCap-BB-OM2	C34
60011421	1002771	UC^{FIBRE} I/O DI LSHF ES9 6 OM2B	6	MaxCap-BB-OM2	C34
60018883	1004745	UC^{FIBRE} I/O DI LSHF ES9 8 OM2B	8	MaxCap-BB-OM2	C34
60018884	1004746	UC^{FIBRE} I/O DI LSHF ES9 12 OM2B	12	MaxCap-BB-OM2	C34
60018885	1004747	UC^{FIBRE} I/O DI LSHF ES9 24 OM2B	24	MaxCap-BB-OM2	C34
60019951	1004743	UC^{FIBRE} I/O DI LSHF ES9 4 OM2B BK	4	MaxCap-BB-OM2	C34
60019952	1004777	UC^{FIBRE} I/O DI LSHF ES9 8 OM2B BK	8	MaxCap-BB-OM2	C34
60019953	1004778	UC^{FIBRE} I/O DI LSHF ES9 12 OM2B BK	12	MaxCap-BB-OM2	C34
60019954		UC^{FIBRE} I/O DI LSHF ES9 24 OM2B BK	24	MaxCap-BB-OM2	C34
60019274	1002825	UC^{FIBRE} I/O DI LSHF ES9 2 OM3B	2	MaxCap-BB-OM3	C31
60018808		UC^{FIBRE} I/O DI LSHF ES9 4 OM3B	4	MaxCap-BB-OM3	C31
60018905	1002820	UC^{FIBRE} I/O DI LSHF ES9 6 OM3B	6	MaxCap-BB-OM3	C31
60018882	1004770	UC^{FIBRE} I/O DI LSHF ES9 8 OM3B	8	MaxCap-BB-OM3	C31
60018933	1002823	UC^{FIBRE} I/O DI LSHF ES9 12 OM3B	12	MaxCap-BB-OM3	C31
60019399		UC^{FIBRE} I/O DI LSHF ES9 16 OM3B	16	MaxCap-BB-OM3	C31
60011423	1002446	UC^{FIBRE} I/O DI LSHF ES9 24 OM3B	24	MaxCap-BB-OM3	C31
60019530	1002826	UC^{FIBRE} I/O DI LSHF ES9 4 OM3B BK	4	MaxCap-BB-OM3	C31
60019531	1004770	UC^{FIBRE} I/O DI LSHF ES9 8 OM3B BK	8	MaxCap-BB-OM3	C31
60019532	1002828	UC^{FIBRE} I/O DI LSHF ES9 12 OM3B BK	12	MaxCap-BB-OM3	C31
60019533	1006530	UC^{FIBRE} I/O DI LSHF ES9 16 OM3B BK	16	MaxCap-BB-OM3	C31
60019534	1002852	UC^{FIBRE} I/O DI LSHF ES9 24 OM3B BK	24	MaxCap-BB-OM3	C31
60048332		UC^{FIBRE} I/O DI LSHF ES9 4 OM4B	4	MaxCap-BB-OM4	C32
60019673	1002830	UC^{FIBRE} I/O DI LSHF ES9 6 OM4B	6	MaxCap-BB-OM4	C32
60018942	1002824	UC^{FIBRE} I/O DI LSHF ES9 12 OM4B	12	MaxCap-BB-OM4	C32
60018943	1002449	UC^{FIBRE} I/O DI LSHF ES9 24 OM4B	24	MaxCap-BB-OM4	C32
60019535	1002834	UC^{FIBRE} I/O DI LSHF ES9 4 OM4B BK	4	MaxCap-BB-OM4	C32
60019536	1002829	UC^{FIBRE} I/O DI LSHF ES9 8 OM4B BK	8	MaxCap-BB-OM4	C32
60019537	1002853	UC^{FIBRE} I/O DI LSHF ES9 12 OM4B BK	12	MaxCap-BB-OM4	C32
60019538	1005660	UC^{FIBRE} I/O DI LSHF ES9 16 OM4B BK	16	MaxCap-BB-OM4	C32
60019539	1002854	UC^{FIBRE} I/O DI LSHF ES9 24 OM4B BK	24	MaxCap-BB-OM4	C32
		UC^{FIBRE} I/O DI LSHF ES9 12 OM5B	12	WideCap-OM5	C39
		UC^{FIBRE} I/O DI LSHF ES9 24 OM5B	24	WideCap-OM5	C39
60019686		UC^{FIBRE} I/O DI LSHF ES9 2 MM61	2	OM1 62.5/125	C02
60058403	1004813	UC^{FIBRE} I/O DI LSHF ES9 4 MM61	4	OM1 62.5/125	C02
60012489	1002772	UC^{FIBRE} I/O DI LSHF ES9 6 MM61	6	OM1 62.5/125	C02
60018881		UC^{FIBRE} I/O DI LSHF ES9 8 MM61	8	OM1 62.5/125	C02
60018791	1002774	UC^{FIBRE} I/O DI LSHF ES9 12 MM61	12	OM1 62.5/125	C02
60018804		UC^{FIBRE} I/O DI LSHF ES9 24 MM61	24	OM1 62.5/125	C02
60019428		UC^{FIBRE} I/O DI LSHF ES9 2 SM2D	2	OS2 G.652.D	C03e
60018903	1004748	UC^{FIBRE} I/O DI LSHF ES9 4 SM2D	4	OS2 G.652.D	C03e
60018906	1004749	UC^{FIBRE} I/O DI LSHF ES9 6 SM2D	6	OS2 G.652.D	C03e
60018910	1004750	UC^{FIBRE} I/O DI LSHF ES9 12 SM2D	12	OS2 G.652.D	C03e
60019397		UC^{FIBRE} I/O DI LSHF ES9 16 SM2D	16	OS2 G.652.D	C03e
60018912	1002448	UC^{FIBRE} I/O DI LSHF ES9 24 SM2D	24	OS2 G.652.D	C03e
60037923	1004798	UC^{FIBRE} I/O DI LSHF ES9 4 SM2D BK	4	OS2 G.652.D	C03e
60037924	1004799	UC^{FIBRE} I/O DI LSHF ES9 8 SM2D BK	8	OS2 G.652.D	C03e
60020574	1002822	UC^{FIBRE} I/O DI LSHF ES9 12 SM2D BK	12	OS2 G.652.D	C03e
60038345	1004801	UC^{FIBRE} I/O DI LSHF ES9 16 SM2D BK	16	OS2 G.652.D	C03e
60020341	1002855	UC^{FIBRE} I/O DI LSHF ES9 24 SM2D BK	24	OS2 G.652.D	C03e

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		UC^{FIBRE} I/O DI LSHF ES9 6 SM7A1	6	OS2 BendBright G.657.A1	C17
		UC^{FIBRE} I/O DI LSHF ES9 12 SM7A1	12	OS2 BendBright G.657.A1	C17
		UC^{FIBRE} I/O DI LSHF ES9 24 SM7A1	24	OS2 BendBright G.657.A1	C17
60019749		UC^{FIBRE} I/O DI LSHF ES9 4 SM7B	4	OS2 BendBrightXS G.657.A2	C24
		UC^{FIBRE} I/O DI LSHF ES9 6 SM7B	6	OS2 BendBrightXS G.657.A2	C24
		UC^{FIBRE} I/O DI LSHF ES9 12 SM7B	12	OS2 BendBrightXS G.657.A2	C24
		UC^{FIBRE} I/O DI LSHF ES9 24 SM7B	24	OS2 BendBrightXS G.657.A2	C24
60018909		UC^{FIBRE} I/O DI LSHF ES9 6 MM61 + 6 SM2D	12	Hybrid 6 x OS2 G.652.D + 6 x OM1 62.5/125	C03e + C02
60019288		UC^{FIBRE} I/O DI LSHF ES9 12 OM3B + 12 SM2D	24	Hybrid 12 x OS2 G.652.D + 12 x MaxCap-BB-OM3	C03e + C31
60044406		UC^{FIBRE} I/O DI LSHF ES9 12 OM4B + 12 SM2D	24	Hybrid 12 x OS2 G.652.D + 12 x MaxCap-BB-OM4	C03e + C32
60019430	1002851	UC^{FIBRE} I/O DI LSHF ES9 6 OM3B + 6 SM2D	12	Hybrid 6 x OS2 G.652.D + 6 x MaxCap-BB-OM3	C03e + C31

**DoP Numbers are per product code and any DoP number proves CPR approval for the cable. DoP files can be downloaded from the website: www.prysmiangroup.com/cpr*

C31: MaxCap-BB-OM3 Multimode Fibre

Specifications of cabled bend-insensitive OM3 fibre

General and Application

Prysmian MaxCap BendBright® OM3, laser-optimised, bend-insensitive, graded-index multimode fibres are designed for transmission speeds of 10 Gb/s and beyond. It is suitable for systems operating at 850 nm and 1300 nm wavelengths. MaxCap BendBright® OM3 fibres incorporate BendBright® technology to deliver enhanced macro-bending performance. Prysmian multimode fibres are produced with proprietary Plasma Chemical Vapour Deposition (PCVD) process.

Standards

IEC 60793-2-10: type A1a.2	ISO/IEC 11801 category OM3
TIA/EIA-492 AAAC	ANSI/TIA/EIA-568.C
ITU G.651.1	ISO/IEC 24764

Cabled Fibre Attenuation

Attribute	Measurement method	Units	Limits
Attenuation at 850 nm	IEC 60793-1-40	dB/km	≤ 3.0
Attenuation at 1300 nm	IEC 60793-1-40	dB/km	≤ 1.0

Optical Specifications (Bare Fibre)

Attribute	Measurement method	Units	Limits
Attenuation at 850 nm	IEC 60793-1-40	dB/km	≤ 2.5
Attenuation at 1300 nm	IEC 60793-1-40	dB/km	≤ 0.7
Attenuation Difference btw. 1380 nm and 1300 nm	IEC 60793-1-40	dB/km	≤ 3.0
Point Discontinuity at 850 nm and 1300 nm	IEC 60793-1-40	dB	≤ 0.1
Numerical Aperture	IEC 60793-1-43	-	0.200 ± 0.015

Bending Loss

Mandrel Radius =7.5 mm, 2 turns at 850/1300 nm	IEC 60793-1-40	dB	≤ 0.2 / ≤ 0.5
Mandrel Radius =15 mm, 2 turns at 850/1300 nm	IEC 60793-1-40	dB	≤ 0.1 / ≤ 0.3

Bandwidth

Overfilled Launch Modal Bandwidth (OFL) at 850 nm	IEC 60793-1-41	MHz • km	≥ 1500
Overfilled Launch Modal Bandwidth (OFL) at 1300 nm	IEC 60793-1-41	MHz • km	≥ 500
Effective Modal Bandwidth (EMB) at 850 nm	IEC 60793-1-49	MHz • km	≥ 2000

Multimode System Reach

Transmission Distance*	1000BASE-SX	1000 m
	10GBASE-SR	300 m
	40GBASE-SR4	140 m
	100GBASE-SR10	140 m
	100GBASE-SR4	70 m

*Indicated link distances require total connector loss ≤ 1.0 dB, and VCSEL spectral bandwidth of ≤ 0.45 nm

C31: MaxCap-BB-OM3 Multimode Fibre

Geometrical Specifications

Attribute	Measurement method	Units	Limits
Core diameter	IEC 60793-1-20	µm	50 ± 2.5
Core non-circularity	IEC 60793-1-20	%	≤ 5
Core-cladding concentricity error	IEC 60793-1-20	µm	≤ 1
Cladding diameter	IEC 60793-1-20	µm	125.0 ± 1.0
Cladding non-circularity	IEC 60793-1-20	%	≤ 0.7
Coating diameter – uncoloured	IEC 60793-1-21	µm	242 ± 7
Coating diameter - coloured	IEC 60793-1-21	µm	250 ± 15
Coating non-circularity	IEC 60793-1-21	%	≤ 5
Coating-cladding concentricity error	IEC 60793-1-21	µm	≤ 10

Mechanical Specifications

Attribute	Measurement method	Units	Limits
Proof stress level	IEC 60793-1-30	GPa	≥ 0.7 (1%)
Average strip force	IEC 60793-1-32	N	≥ 1.0 ≤ 3.0
Peak strip force	IEC 60793-1-32	N	≥ 1.3 ≤ 8.9

Group Index of Refraction

Typical Group index of refraction at 850 nm	IEC 60793-1-22	-	1.482
Typical Group index of refraction at 1300 nm	IEC 60793-1-22	-	1.477