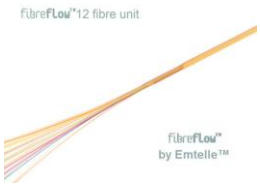
fibreflow™ Blown Fibre Fibre Units, Multimode

OM1, OM2, OM3 and OM4



Product Description

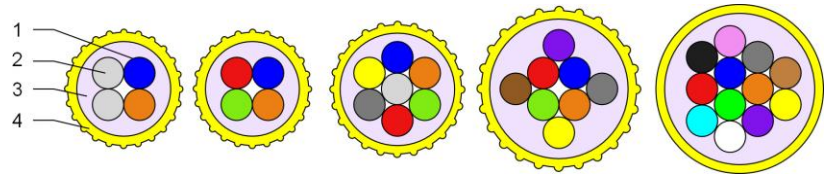
Fibre Unit (FU) with up to twelve fibres set in an encapsulating layer providing excellent dimensional and thermal stability. An outer thermoplastic layer provides a high level of protection and excellent installation properties. The FU is designed for blowing into fibreflow™ microducts and tube bundles. The fibres are dry, not coated with gel, thus permitting fast and contamination –free connections.

The FU contain various 62.5/125 micron and 50/125 micron multimode fibres meeting ISO/IEC 11801.

Features

- Designed to be installed by blowing
- Low weight
- Small diameter
- All dielectric design
- Ultra low friction sheath
- Best in class blowing performance
- Low coil set

Fibre Unit Properties

Construction 1: Optical Fibre 2: Filler (mechanical fibre) 3: Encapsulation 4: Low friction sheath	**Fibre Unit FU** 				
	2f	**4f**	**6f**	**8f**	**12f**
Outer diameter (nominal)	1.1 mm	1.1 mm	1.3 mm	1.5 mm	1.6 mm
Mass (nominal)	1.0 g/m	1.0 g/m	1.6 g/m	1.8 g/m	2.2 g/m
Min bend radius	50 mm	50 mm	65 mm	80 mm	80mm
Temperatures Storage Installation Lifetime	-20°C to +70°C -5°C to +50°C -20°C to +50°C				

OFNP RATED (USA): The 2, 4, 8 and 12(see note) fibre units described here are UL approved for use in plenum zones when deployed inside plenum-rated tube bundles to Emtelle specification MHT 1748.
Note: Approved 12fu has a reduced mass of 2.0g/m

Attenuation

Fibre Class	Maximum Attenuation at 20ºC (dB/km)	
	850nm	1300nm
62.5/125 Fibres: OM1 and OM1 HBW	3.5	1.0
50/125 Fibres: OM2, OM2 HBW, OM3 and OM4	2.6	0.8

Standards

Emtelle Class	Fibre Core/Cladding (microns)	ISO/IEC 11801	IEC 60793-2-10	TIA/EIA
OM1 and OM1 HBW	62.5/125	type OM1	type A1b	492AAAA-A
OM2 and OM2 HBW	50/125	type OM2	type A1a.1	492AAAB
OM3	50/125	type OM3	type A1a.2	492AAAC-A
OM4	50/125	type OM4	TBA	492AAAD

Bandwidth and Transmission Capacity

Fibre Class	Bandwidth (MHz.km)				*1000Base-SX Gigabit Ethernet Reach (m) at 850nm	**10GBase-SR 10 Gigabit Ethernet Reach (m) at 850nm
	Legacy LED Based OFL[a]		Laser Based RML[b]	Laser Based EMB[c]		
	850nm	1300nm	850nm	850nm		
OM1	200	500	220	-	300	-
OM1 HBW	200	600	220	-	300	-
OM2	500	500	-	510	600	-
OM2 HBW	600	1200	-	-	600 850nm & 1300nm	-
OM3	1500	500	-	2000	1000	300
OM4	3500	500	-	4700	1100[d]	550[d]

Notes:

a. OFL; measured by over filled launch as per IEC 60793-1-41, for legacy and LED-based systems.

b. RML; measured by restricted modal launch as per IEC 60793-1-41. for intermediate performance laser based systems.

c. EMB; Effective modal bandwidth by minEMBc in accordance with IEC 60793-1-49.

d. Extended reach requires maximum cabled attenuation 3.0dB/km and total connector loss of 1.0dB at 850nm.

* Gigabit Ethernet: Characterised system reach is based on IEEE 802.3z Standard Reference Model in accordance with ISO/IEC 11801. System reach can be calculated using EMB.

** 10 Gigabit Ethernet: Characterised system reach is based on IEEE 802.3ae Standard Reference Model in accordance with ISO/IEC 11801. System reach can be calculated using EMB.

Mechanical Performance (all optical measurements at 1300 nm and 850 nm)

Test	Test Method	Test Parameters	Product Specification
Tensile Performance	EN 187000 A1/ 501 IEC60 794-12-E1	Load is 1km mass (1W) Duration 10 min	Fibre strain ≤0.4% at max. force [1]No attenuation increment and fibre strain ≤0.05% after test.
Tensile Service Load		Maximum W/3 Duration of product lifetime	Given tensile performance above, product lifetime loading as per industry best practice.
Flexing	IEC 60794-1-2-E11A	Diam 40mm x 3 turns 5 cycles at 20°C	[1]No attenuation increment after test.
Crush I	IEC 60794-1-2-E3	100 mm plate, 100N, 1 min, 3 tests at different places	[1]No attenuation increment after test.
Crush II	IEC 60794-1-2-E3	100 mm plate, 500N, 15 min, 3 tests at different places	No fibres broken.

1. No attenution increment defined as
≤ 0.25dB/km change for multimode fibre at 850nm and 1300nm.

Environmental Performance (all optical measurements at 1310nm and 1550nm)

Test	Test Method	Test Parameters	Product Specification
Water Soak	IEC 60794-5	1000 hours in water, 18°C/22°C	Test after temp cycle ≤0.25 dB/km change during and after test
Temperature Cycle	IEC 60794-1-2-F1 (3 cycles)	+20°C, –20°C, +60°C	Attenuation increment during and after test OM1: ≤0.25dB/km OM2,3,4: ≤0.40dB/km
Damp Heat Cycle	IEC 60068-2-38 (10 cycles)	25°C, 65°C, 25°C, 65°C, 25°C, -10°C, 25°C	Attenuation increment during and after test ≤0.25dB/km

Identification

Sheath Colour:	Yellow with black print every 1 metre
Fibre colours:	blue, orange, green, red, grey, yellow, brown, violet, black, aqua, pink, white
Fillers:	natural (mechanical fibre)

Installation and Handling

Store FUs in supplied containers under dry and damp free conditions, until time of deployment.

Designed for installation into microducts, internal diameter from 3.0mm upwards (2.1mm upwards for 2 and 4 fibre counts). Standard installation equipment may be used (eg Emtelle Fusion, Plummett EM25, PRM-196, and BT 2A).

Breakout: remove outer sheath using a tool with pre-set blade depth to suit (eg. Microcable FU Stripper (code 9719). Remove a short length of inner sheath using a stripping tool (eg. 7562) to enable removal of fibres by peeling apart in groups.

Follow up-to-date installation and handling recommendations as defined in MHT2380 (a copy is provided with every pan of fibre).