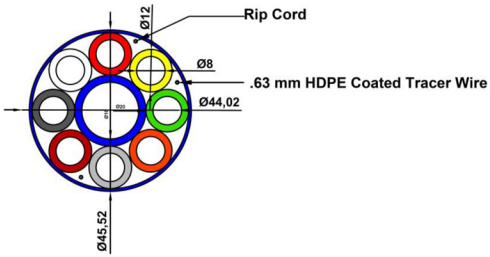
OPTiLite Fibre Cable

HDPE Multiduct 8 x 12/8 mm + 1 x 20/16 mm



Description

1) HDPE Multiduct 8 x 12/8 mm + 1 x 20/16 mm
2) Micro Ducts have Inner Longitudinal Ribs and Permanent Silicone Layer
3) Rip cord and 0.63 mm HDPE coated copper tracer wire

MATERIAL SPECIFICATIONS

Characteristic	Test Method	Acceptance Criteria	Test Frequency
Ducts are manufactured with 100% Virgin HDPE			
Melt Flow Index	ASTM D 1238-10, ASTM F2160	< 0.55 g/10min	Per Batch
Density	ASTM D792-08, ASTM F2160	0.940 -0.955 g/cm³	Per Batch

PHYSICAL AND MECHANICAL PROPERTIES *(Micro duct : 12/8 mm Micro Duct)*

Characteristic	Test Method	Acceptance Criteria	Test Frequency
Outer Diameter	ASTM D 2122 a) In-line control (X/Y laser) b) 5 measurements equidistant apart around circumference	12.0 ± 0.1 mm	a) 5 times/sec b) Per drum
Inner Diameter	ASTM D 2122 5 measurements equidistant apart around circumference	8.0 ± 0.1 mm	Per drum
Wall thickness	ASTM D 2122 5 measurements equidistant apart around circumference	2.0 ± 0.1 mm	Per drum
Ovality	ASTM D 2122 (Max. Outer Diameter – Min. Outer Diameter) /Average Outer Diameter	≤ 5%	Per drum
Standard Dimension Ratio	N/A SDR= Outer dia./Wall thickness	6.0	N/A
Pressurization	5 min @ 12 bar each micro duct	No damage, No leaks.	Per drum
Inner Clearance Test	IEC 60794-1-2 Method E23	6.4 mm steel ball shall pass freely through micro duct.	Per drum

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PHYSICAL AND MECHANICAL PROPERTIES *(Micro duct : 12/8 mm Micro Duct)*

Characteristic	Test Method	Acceptance Criteria	Test Frequency
Crush	IEC 60794-1-2 Method E3, 1500 N load, 60 sec, 1 hour recovery time.	No residual deformation > 15% of inner and outer diameter. Shall pass inner clearance test.	Per Batch
Tensile Strength at yield	IEC 60794-1-2 Method E1, ASTM F 2160, ASTM D 638 (Type IV),speed 50mm/min	20 – 30 N/mm²	Per Batch
Elongation at Break	IEC 60794-1-2 Method E1, ASTM F 2160, ASTM D 638 (Type IV),speed 50mm/min	Min 400%	Per Batch
Kink	IEC 60794-1-2 Method E8	Duct bent between 2 parallel supports 20XOD apart	Per Batch
Bend Test	IEC 60794-1-2 Method E11A, 20 X OD	No residual deformation > 15% of inner and outer diameter. Shall pass inner clearance test.	Per Batch
Environmental Stress Crack Resistance	ASTM D 1693	No crack shall observed at 50±2°cfor 96 hours, when used 10% Igepal solution	Per Batch
Impact	IEC 60794-1-2 Method E4, 5 J Impact, 10 mm anvil, recovery time 1 hour.	No residual deformation > 15% of inner and outer diameter. Shall pass inner clearance test.	Per Batch
Repeated Bending	IEC 60794-1-2 Method E6, 15 x OD	No residual deformation > 15% of inner and outer diameter. Shall pass inner clearance test.	Passed
Co-efficient of Friction	Bell core, 750 mm Diameter, 450° loop, 5 kg tail mass	$\mu < 0.06$	Per Batch
Heat Reversion	ISO 2505	110°c for 1 hrs (< 3%)	Per Batch
Colour	Visual inspection	As per customer choice	Per drum
Printing	Visual inspection	As per customer choice	Per drum

PHYSICAL AND MECHANICAL PROPERTIES *(Micro duct : 20/16 mm Micro Duct)*

Characteristic	Test Method	Acceptance Criteria	Test Frequency
Outer Diameter	ASTM D 2122 a) In-line control (X/Y laser) b) 5 measurements equidistant apart around circumference	20.0 ± 0.1 mm	a) 5 times/sec b) Per drum
Inner Diameter	ASTM D 2122 5 measurements equidistant apart around circumference	16.0 ± 0.1 mm	Per drum
Wall thickness	ASTM D 2122 5 measurements equidistant apart around circumference	2.0 ± 0.1 mm	Per drum

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PHYSICAL AND MECHANICAL PROPERTIES *(Micro duct : 20/16 mm Micro Duct)*

Characteristic	Test Method	Acceptance Criteria	Test Frequency
Ovality	ASTM D 2122 (Max. Outer Diameter – Min. Outer Diameter) /Average Outer Diameter	≤ 5%	Per drum
Standard Dimension Ratio	N/A SDR= Outer dia./Wall thickness	10.0	N/A
Pressurization	5 min @ 12 bar each micro duct	No damage, No leaks.	Per drum
Inner Clearance Test	IEC 60794-1-2 Method E23	12.80 mm steel ball shall pass freely through micro duct.	Per drum
Crush	IEC 60794-1-2 Method E3, 1200 N load, 60 sec, 1 hour recovery time.	No residual deformation > 15% of inner and outer diameter. Shall pass inner clearance test.	Per Batch
Tensile Strength at yield	IEC 60794-1-2 Method E1, ASTM F 2160, ASTM D 638 (Type IV),speed 50mm/min	20 – 30 N/mm²	Per Batch
Elongation at Break	IEC 60794-1-2 Method E1, ASTM F 2160, ASTM D 638 (Type IV),speed 50mm/min	Min 400%	Per Batch
Kink	IEC 60794-1-2 Method E8	Duct bent between 2 parallel supports 20XOD apart	Per Batch
Bend Test	IEC 60794-1-2 Method E11A, 20 X OD	No residual deformation > 15% of inner and outer diameter. Shall pass inner clearance test.	Per Batch
Environmental Stress Crack Resistance	ASTM D 1693	No crack shall observed at 50±2°cfor 96 hours, when used 10% Igepal solution	Per Batch
Impact	IEC 60794-1-2 Method E4, 5 J Impact, 10 mm anvil, recovery time 1 hour.	No residual deformation > 15% of inner and outer diameter. Shall pass inner clearance test.	Per Batch
Repeated Bending	IEC 60794-1-2 Method E6, 15 x OD	No residual deformation > 15% of inner and outer diameter. Shall pass inner clearance test.	Passed
Co-efficient of Friction	Bell core, 750 mm Diameter, 450° loop, 5 kg tail mass	$\mu < 0.06$	Per Batch
Heat Reversion	ISO 2505	110°c for 1 hrs (< 3%)	Per Batch
Colour	Visual inspection	As per customer choice	Per drum
Printing	Visual inspection	As per customer choice	Per drum

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PHYSICAL AND MECHANICAL PROPERTIES *(Bundled Ducts)*

Characteristic	Test Method	Acceptance Criteria	Test Frequency
Wall thickness (Sheathing)	ASTM D 2122, 6 measurements equidistant apart around circumference.	1.5 ± 0.1 mm	Per coil
Pressurization	5 min @ 12 bar each micro duct	No damage, No leaks.	Per coil
Inner Clearance Test (per micro duct per coil)	IEC 60794-1-2 Method E23	6.4 and 12.8 mm steel ball shall pass freely through micro duct	Per coil
Kink	IEC 60794-1-21 Method E10, 15 x OD	No residual deformation > 15% of inner and outer diameter. Shall pass inner clearance test.	Per Batch
Crush	IEC 60794-1-2 Method E3, 2000 N load, 60 sec, 1 hour recovery time.	No residual deformation > 15% of inner and outer diameter. Shall pass inner clearance test.	Per Batch
Impact	IEC 60794-1-2 Method E4, 15 J Impact, 10 mm anvil, recovery time 1 hour.	No residual deformation > 15% of inner and outer diameter. Shall pass inner clearance test.	Per Batch
Colour	Visual inspection	As per customer choice	Per Coil
Tensile Strength at yield	IEC 60794-1-2 Method E1 ASTM F 2160, ASTM D 638 (Type IV), speed 50mm/min	20 – 30 N/mm^2	Per Batch
Elongation at Break	IEC 60794-1-2 Method E1 ASTM F 2160, ASTM D 638 (Type IV), speed 50mm/min	Min 400%	Per Batch
Bend Test	IEC 60794-1-2 Method E11A, 20 X OD	No residual deformation > 15% of inner and outer diameter. Shall pass inner clearance test.	Per Batch
Printing	Visual inspection	As per customer choice	Per Coil