

## 5.0/3.5MM INTERNAL TUBE ASSEMBLIES (LSOH).

Assemblies of LFH tubes, each with low friction performance for fibre blowing. The tube bundle is surrounded with a sheath of Natural LFH material, giving excellent performance in a fire scenario:

- a) Low flammability
- b) Low smoke
- c) Low acid/fume
- d) Halogen-free.

The lightweight, metal-free, flexible tube assembly is intended for indoor installation, and may be pulled into suitable indoor ducts using low tensions. It is not for direct burial or aerial use.

The sheath is marked in one plane, at 1 metre intervals, with the following legend:

—||| M \* PRYSMIAN TUBING PGH yyyy INTERNAL LSOH n WAY

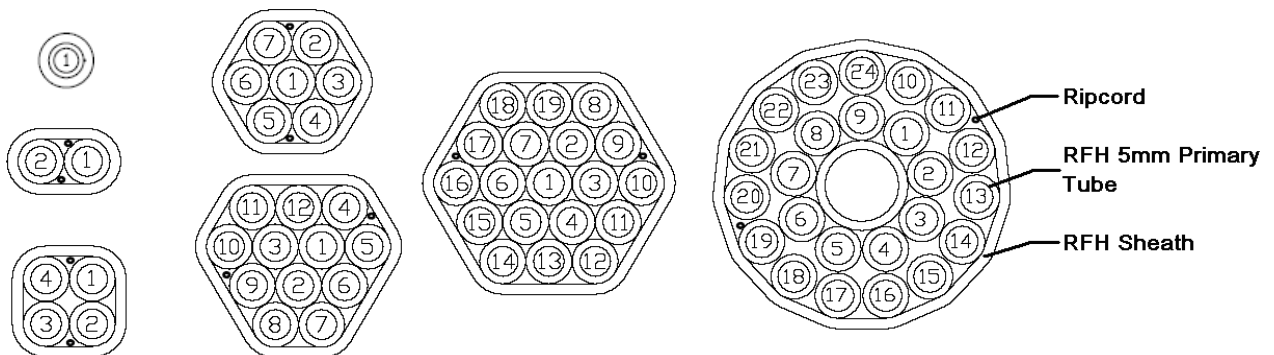
where:      |||      - sequential length mark  
               yyyy    - year of manufacture  
               n        - number of PE tubes

### Primary Tubes Technical Details

Internal diameter (nominal):                    3.5mm  
 External diameter (nominal):                 5.0mm  
 Operation Pressure rating:                    10 Bar

### Assembly Technical Details

	Reference	Nom OD (mm)	Max Tensile (N)	Bend Radius (mm)	Weight (kg/km)	Crush (N)
LSOH-1 Way	5500531	7.0	140	110	44	400
LSOH -2 Way	5500532	12.2 x 7.2	375	150 x 90	75	400
LSOH -4 Way	5500533	14.3 x 12.2	610	175 x 150	122	400
LSOH -7 Way	5500534	17.0 x 15.7	925	205 x 190	185	400
LSOH -12 Way	5500535	22.3 x 20.0	1450	270 x 240	290	400
LSOH -19 Way	5500536	27.0 x 24.3	2100	325 x 295	420	400
LSOH -24 Way	5500537	32.0 x 31.8	2900	385 x 380	580	400



### Colour Code

The tubes are Halogen free flame retardant thermoplastic coloured grey. Each primary tube is printed along its length in a contrasting colour (2.5 ± 0.5) mm high at intervals of 50mm with a unique number as detailed in layouts above except for the 1 tube assembly.

### Primary Tubes Type Tests:

Mechanical Properties	International Standard	Test Conditions	Performance
Tensile Strength	IEC 60794-1-2 Method E1	microduct length under tension: > 1m Tensile load: 0.5 W* Rate of Extension: ≥ 20mm/min Duration of max load: 10 min  Where Maximum tensile load = 0.5x 9.81 x W , N, W = mass of 1Km of component in Kg	Pass : No permanent damage or deformation to the primary tubing or component parts of the sheath assembly after an applied load at 20mm/minute.
Kink	IEC 60794-1-2 Method E10	Diameter: ≤20 x OD	Pass : The outer and inner diameter of the microducts shall show, under visual examination without magnification no damage and no reduction of diameter greater than 15%
Impact	IEC 60794-1-2 Method E4	Striking surface radius: 10 mm Impact: 1 Joules Number of impacts: 3 Recovery Time: 1 hr	Pass : Under visual examination, without magnification, there shall be no damage to the microduct. There shall be no residual deformation greater than 15% of the microduct diameter and no splitting or permanent damage. The imprint of the anvil on the sheath is not considered as mechanical damage.
Crush	IEC 60794-1-2 Method E3	Sample length: 1 m Load : 400N Duration of maximum load: 1 minute No applied loads: 3 (500mm apart) Recovery time: 1 hr	Pass : No permanent damage shall be imparted to the tubes as a result of this test Permanent deformation of the individual primary tube diameter shall be less than 0.5mm as a result of this test.
Bend	IEC 60794-1-2 Method E11	No Turns: 5 Mandrel diameter: ≤12 x OD Number of Cycles: 3	Pass : No permanent damage shall be imparted to the tubes as a result of this test Permanent deformation of the individual primary tube diameter shall be less than 0.5mm as a result of this test.
Friction		Sample length: 1.5 m Mandrel diameter: 300mm  The sample length is secured with 45° wrap around the mandrel with one end of the tube hanging downwards, the other end pointing horizontally towards the tensile machine	Pass : A 5kg weight shall be pulled at 1000mm/min and travel 100mm. An average force of 2 pulls shall be recorded to give a coefficient of friction less than 0.1
Pressure performance	IEC 86A/1205/CD Annex C	Test temperatures: 0°C to +40°C Pressure medium: Water (+anti freeze) Proof test pressure: 12925 mbar Duration of proof test pressure: 24 hours Minimum burst test pressure: 25850 mbar	Pass : Primary tubing shall be capable of sustaining the stated requirements without bursting or loss of pressure.

### Tube Assembly Type Tests:

Mechanical Properties	International Standard	Test Conditions	Performance
Tensile Strength	IEC 60794-1-2 Method E1	microduct length under tension: > 1m Tensile load: 0.5 W* Rate of Extension: ≥ 20mm/min Duration of max load: 10 min  Where Maximum tensile load = 1.0x 9.81 x W , N, W = mass of 1Km of component in Kg	Pass : No permanent damage or deformation to the primary tubing or component parts of the sheath assembly after an applied load at 20mm/minute.
Bend	IEC 60794-1-2 Method E11	No Turns: 5 Mandrel diameter: ≤12 x OD Number of Cycles: 3	Pass : The outer and inner diameter of the microducts shall show, under visual examination without magnification no damage and no reduction of diameter greater than 15%
Kink	IEC 60794-1-2 Method E10	Diameter: 20 x OD	Pass : No permanent damage shall be imparted to the sheath or tubes as a result of this test Permanent deformation of the individual primary tube diameter shall be less than 0.5mm as a result of this test.
Impact	IEC 60794-1-2 Method E4	Striking surface radius: 10 mm Impact: 1 Joules Number of impacts: 3 Recovery Time: 1 hr	Pass : Under visual examination, without magnification, there shall be no damage to the microduct. There shall be no residual deformation greater than 15% of the microduct diameter and no splitting or permanent damage. This shall be verified by passing the inner clearance test. The imprint of the anvil on the sheath is not considered as mechanical damage.
Crush	IEC 60794-1-2 Method E3	Sample length: 1 m Load : 400N Duration of maximum load: 1 minute No applied loads: 3 (500mm apart) Recovery time: 1 hr	Pass : No permanent damage shall be imparted to the sheath or tubes as a result of this test Permanent deformation of the individual primary tube diameter shall be less than 0.5mm as a result of this test.
Flame Propagation Tests	IEC 60332	Single Cable Vertical Burning Test The completed cable shall conform to IEC 60332-1.  Bunched Cable Vertical Burning Test The completed cables shall conform to IEC 60332-3.	
Fume and Gas Emission Tests	IEC 60754	Acid Gas Emission - The materials shall conform to IEC 60754-1. Corrosivity of Evolved Gases The materials shall conform to IEC60754-2  Fume Emission The material shall not include any functional groups containing Halogen, Phosphorous, Nitrogen or Sulphur, however, trace amounts up to 0.5% w/w maybe permitted.	
Smoke Emission Tests	IEC 61034-2	Cables shall conform to IEC 61034-2	During the tests there shall be no significant flame spread beyond the area of flame impingement, no dripping of liquid from the cable and no after burning.
Flammability Temperature	BS EN ISO 4589-3	BS EN ISO 4589-3 not less than 270°C	