



### Description

LANLINE Armour Steel Wired Outside Plant FO cable is a key part of HUBNETIX Fibre system. LANLINE Armour steel wired OSP cable is available in Multi-Tube and Uni-Tube designs. Wire Armoured cables are used in harsh environmental conditions requiring greater tensile strength, is ideal for outdoor installations in a duct or for direct burial. Higher crush and impact resistance than standard steel tape Armoured cables. These LANLINE OSP cables are available with all kinds of Singlemode (meets OS2 ITU-T G.652.D standards) and Multimode-OM1, OM2, OM3 and OM4 fiber types. The cable is available in fibre counts from 12F to 144F fibres as a 'Multi tube' design and 4F to 24F fibres as a 'Uni tube' design. HUBNETIX's LANLINE Fibre optic cables are compliance with IEC 60794, EIA/TIA, and ITU-T standards. This OSP cable is RoHS and CE compliant.

### Armour Steel Wired Uni-Tube Cable Construction Details

The Armour Steel Wired Multi-Tube cable have strain free fiber due to S-Z stranding. The cable core is constructed of fiber filled buffer tubes stranded around the central strength member. Longitudinal water protection is enabled by water blocking compounds in tube and core, encased in a black inner sheath. A galvanized steel wire Armour and a black Outer Sheath complete the cable construction. Ripcords are included under the inner sheath and each armour for ease of entry. An outer HDPE/LSZH sheath is extruded over this armouring.

### Standard Compliance

- Telecordia GR-20, IEC 60794
- EIA/TIA, ITU-T, EN187000, RUS1755.900

### Environmental Specifications (Temperature)

- Operation / Storage : -40°C to +70°C
- Installation : -30°C to +75°C

### Features

- Fibre Count: Multi-tube 12F to 144F, Uni-tube 4F to 24F
- Multiple Fibre types include - Multimode-OM1, OM2, OM3, OM4; Singlemode-OS1, OS2 and Hybrids
- Galvanised Steel Wire Armouring
- High Strength
- High Crush and Impact Resistance
- Length option of 2.0, 4.0 km
- Available other lengths and customised designs

### Advantages

- High Fibre Density
- Multiple Network Applications
- Improves Compressive Strength and Rodent protection

### Application

- Suitable for Duct or Buried Installations such as Tunnels.
- Excellent Mechanical features
- High Anti-Rodent protection

### Physical Characteristics

Fibre Count	Cable Outer Diameter (mm) Nominal	Weight (kg/km) (Nominal)	Tensile Strength (Nominal)		Crush Resistance (N/10cm)	Bending Radius (mm)	
			Installation	Operation		Temporary	Permanent
12-24	14.5	295	19000	10000	4000	145	290
26-48	14.5	295	19000	10000	4000	145	290
50-72	16.0	350	22000	12000	4000	160	320
74-96	16.0	350	22000	12000	4000	160	320
98-120	17.5	415	23000	13000	4000	175	350
122-144	20.5	560	25000	14000	4000	205	410

## Armoured Steel Wired Multi-Tube Outside Plant Cable



## Fibre Technical Specifications

## Optical Characteristics

## Multi-Mode - Fibre Type &amp; Grade

Characteristics	Conditions	Specified Values		Units
		62.5/125µm – OM1	50/125µm – OM2/OM3/OM4	
Attenuation	850nm	≤ 3.5	≤ 3.0	dB/km
	1300 nm	≤ 1.5	≤ 1.0	dB/km
Bandwidth	850 nm	≥ 200	≥ 500 / ≥ 1500 / ≥ 3500	MHz.km
	1300 nm	≥ 600	≥ 500 / ≥ 500 / ≥ 500	MHz.km
Ethernet Performance 10GBE	850nm	33	150 /300/ 550	m
Ethernet Performance 1000GBE	850nm	220	750 /1000/ 1100	m
Numerical Aperture		0.275 ± 0.015	0.200 ± 0.015	

## Geometrical Characteristics

Core Diameter		62.5 ± 2.5	50.0 ± 2.5	µm
Core Non – Circularity		≤ 5.0	≤ 5.0	%
Core/Cladding Concentricity Error		≤ 1.5	≤ 1.5	µm
Cladding Diameter		125.0 ± 1.0	125.0 ± 1.0	µm
Cladding Non – Circularity		≤ 1.0	≤ 1.0	%
Primary Coating Diameter		245 ± 10	245 ± 10	µm
Coating/Cladding Concentricity Error		≤ 12	≤ 12	µm
Primary Coating Material (Colored)		UV Cured Acrylate	UV Cured Acrylate	

## Mechanical Characteristics

Bending Induced Attenuation				
10 Turns @60mm Radius	850nm	≤ 0.5		dB
	1300 nm	≤ 0.5		dB
100 Turns @ 37.5mm Radius	850nm		≤ 0.50	dB
	1300 nm		≤ 0.50	dB
2 Turns @ 15mm Radius	850nm		≤ 1.0	dB
	1300 nm		≤ 1.0	dB
Proof Stress Level		≤ 1.0	≤ 1.0	%
		≤ 100	≤ 100	kpsi

## Optical Characteristics

## Single-Mode - Fibre Type &amp; Grade

Characteristics	Conditions	Specified Values			Units
		ITU-T G.652.D	ITU-T G.657.A1	ITU-T G.657.A2	
Attenuation	1310 nm	≤ 0.36	≤ 0.36	≤ 0.38	dB/km
	1550 nm	≤ 0.23	≤ 0.23	≤ 0.23	dB/km
Chromatic Dispersion	1285 - 1330 nm		≤ 3.5		ps/(nm.km)
	1550 nm		≤ 18.0		ps/(nm.km)
Cable cutoff wavelength λ <sub>cc</sub>			≤ 1260		nm
Zero Dispersion wavelength			1300 - 1324		nm
Zero Dispersion slope			≤ 0.092		ps/nm <sup>2</sup> .km
Polarization mode Dispersion (PMD)	Fibre		≤ 0.2		ps/km
	Link Design Value		≤ 0.08		ps/km

## Geometrical Characteristics

Mode Field Diameter (MFD)	1310 nm	9.2 ± 0.4	8.6 ± 0.4	6.3 ± 9.5	µm
	1550 nm	10.4 ± 0.5	9.8 ± 0.5		µm
Cladding Diameter			125.0 ± 1.0		µm
Cladding Non – Circularity			≤ 1.0		%
Core/Cladding Concentricity Error			≤ 0.5		µm
Coating/Cladding Concentricity Error			≤ 12.0		µm
Primary Coating Diameter			245 ± 10		µm
Primary Coating Material (Colored)			UV Curved Acrylate		
Fibre Curl (Radius)			≥ 4		m

Note- The optical attenuation/PMD given values may change due to fibre cabling.

## Mechanical Characteristics - SM

## Single-Mode - Fibre Type &amp; Grade

	Conditions	Specified Values			Units
		ITU-T G.652.D	ITU-T G.657.A1	ITU-T G.657.A2	
Bending Induced Attenuation					
1 Turn @32mm Diameter	1550 nm		≤ 0.05		dB
100 Turns @ 50mm Diameter	1310 nm		≤ 0.05		dB
	1550 nm		≤ 0.05		dB
100 Turns @ 60mm Diameter	1625 nm		≤ 0.05		dB
Proof Stress Level			≥ 1.00		%
			≥ 100		kpsi

## Environmental Characteristics

Environmental Tests				
Temperature Dependence	-60 to +85°C		≤ 0.05	dB/km
Temperature-Humidity Cycling	-10 to +85°C		≤ 0.05	dB/km
Water Immersion	23		≤ 0.05	dB/km
Dry Heat Aging	85		≤ 0.05	dB/km
Damp Heat	85°C @ 85% RH		≤ 0.05	dB/km

## Armoured Steel Wired Multi-Tube Outside Plant Cable



## Fibre Color Code

1	RD – Red	7	BR – Brown	13	YL – w/mark every 70mm	19	YL – w/mark every 35mm
2	GR – Green	8	VT – Violet	14	WT – w/mark every 70mm	20	WT – w/mark every 35mm
3	BL – Blue	9	TQ – Turquoise	15	GR – w/mark every 70mm	21	GR – w/mark every 35mm
4	YL – Yellow	10	BK – Black	16	TQ – w/mark every 70mm	22	TQ – w/mark every 35mm
5	WT – White	11	OR – Orange	17	OR – w/mark every 70mm	23	OR – w/mark every 35mm
6	GY – Grey	12	PK – Pink	18	PK – w/mark every 70mm	24	PK – w/mark every 35mm

## Ordering Info &amp; Part Numbers

Part Number Example	Description
HLH-FEA1S2N24-XX	LANLINE 24-Fibre, OS2 SM G.652.D, Armoured Steel Wired, Multi-tube, Outside Plant Cable

HUBNETIX Prefix			1	2	3	4	5	6
H	L	H	F	EA1	S2	N	24	XX

1=F - Fibre Optic	2=Cable construction	3=Fibre type	4=Flame Rating	5=XX - Fibre Count	6=XX - Fibre Color code
	<b>EA1</b> – Outside plant (OSP), Armoured Steel Wired, Multi-tube	<b>S1</b> – Singlemode OS1 9/125µm	<b>L</b> – Low Smoke Zero Halogen <b>H</b> – HDPE	<b>12</b> – 12-fibre <b>24</b> – 24-fibre	
	<b>EA2</b> – Outside plant (OSP), Armoured Steel Wired, Uni-tube	<b>S2</b> – Singlemode OS2 9/125µm (ITU G.652.D)	<b>N</b> – Non-Rated	<b>36</b> – 36-fibre <b>48</b> – 48-fibre <b>72</b> – 72-fibre <b>96</b> – 96-fibre <b>120</b> – 120-fibre <b>144</b> – 144-fibre	
		<b>M1</b> – Multimode OM1 62.5/125µm			
		<b>M2</b> – Multimode OM2 50/125µm			
		<b>M3</b> – Multimode OM3 50/125µm			
		<b>M4</b> – Multimode OM4 50/125µm			

**Note:** All packaging is 2,000 mtr drum reel. The above shown cable designs are HUBNETIX standard designs. Other lengths and customised designs are available upon specific request.

**HUBNETIX CORPORATION**  
71-75, Shelton Street, London, UK.  
[www.hubnetix.com](http://www.hubnetix.com)

The dimensions and specifications in this document are for reference purposes only and are subject to change without notice. Consult HUBNETIX Corp. for the latest dimensions and design specifications.

