

Metallic Systems

LFH-SP Conduit

Technical Characteristics

Conforms to	BSI Kitemark KM-35161 Low voltage directive Lloyds Register of Shipping (Marine Type Approval) NF F16-101 (I1 F1) London Underground 1-085		
Approvals and Standards	    		
Degree of mechanical protection	Medium flexibility & fatigue life		
Degree of protection	IP65 - with SP type M fittings IP54 - with SP type A, B, C, E, & F fittings		
UV protection	High		
Finish	Black		
Application	Rail, Buildings - where low smoke & toxicity is a primary concern		
Normal operating temperature range	Application	Min Temp	Max Temp
	Static	- 20°C	+90°C
	Dynamic	- 5°C	+105°C
For use with - Fitting range	Type A , B , C , E , F , M & C90		
Fire performance	Test Standard	Performance Rating	(See Fire testing data for fire performance overview) 
	EN 45545	HL3	
	NFF16-101	I1 F1	
	LUL-1085	✓	
	BS 6853	Class 1a	
	DIN 5510-2	N/A	
Testing data	Click or See pages 3 & 4		
Type of material	Galvanised steel core - Low Fire Hazard jacket		
Image			

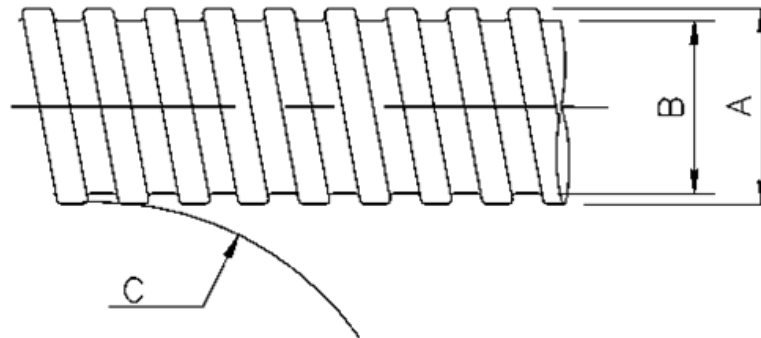
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Technical & Dimensional Data

Conduit size metric (mm)	10	12	16	20	25	32	40	50	63	75
Conduit size US trade (inches)	1/4"	5/16"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"
Part code	-	TLFH-SP	TLFH-SP	TLFH-SP	TLFH-SP	TLFH-SP	TLFH-SP	TLFH-SP	TLFH-SP	TLFH-SP
Coil length (m)	-	10/25/50	10/25/50	10/25/50	10/25/50	10/25	10/25	10/25	10/25	10
A - Outside diameter (mm)	-	14.0	17.0	21.5	26.0	34.0	44.5	55.0	64.5	79.0
B - Inside diameter (mm)	-	10.3	13.0	16.9	21.4	28.1	37.7	48.4	57.5	70.0
C - Static bend radius (mm)	-	30	35	45	55	60	80	90	115	150
Average weight (KG/100m)	-	14.8	23.0	31.2	37	58.2	94.9	115.6	76.8	180

For ordering code add coil length to part code - e.g TLFH-SP25/25M



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BS EN 61386 Classification

	Fitting	Compression	Impact	Min temp	Max temp	bending	electrical	IP solids	IP water	Corrosion	Tensile	Non-flame Propagating	Suspended load
TLFH-SP	TSP(M)	4	4	2	3	4	2	6	5	-	4	1	5

Mechanical Properties

Test Type	Methods / Standards	Requirements	Value
Crush Strength @ 23°C	IEC61386-1	<25% crush >90% recovery	>1250N
Crush Strength @ 23 °C	-	10% Crush, Instantaneous Value	1800N
Impact Strength @ 23 °C	IEC61386-1	No Cracks <20% deformation	>20J
Impact Strength @-5 °C	IEC61386-1	No Cracks. <20% deformation	>6J
Tensile Strength	IEC61386-1	With M Type Fitting	>1000N
Tensile Strength	-	Ultimate pull-out of M-Type Fitting	1450N
Dynamic Bend radius @ -5 °C	IEC61386-23	5000 cycles minimum	4xOD

Thermal Properties

Test Type	Methods / Standards	Requirements	Value
Minimum Temperature	IEC61386-23	Dynamic 5000 cycles	-5°C
Maximum Temperature	IEC61386-23	Dynamic 5000 cycles	105°C
Minimum Static		Permanent Use	-20°C
Maximum Static		Permanent Use	90°C

Chemical Resistance Chart

Key:

Suitable :



Limited Suitability :



Unsuitable :



Not Tested :



● Astm No.1	● Diesel oil	● Methyl Bromide	● Sulphur Dioxide (Gas)
● Astm No.2	● Diethylamine	● MEK	● Sulphuric Acid (10%)
● Astm No.3	● Ethanol	● Nitric Acid (10%)	● Sulphuric Acid (70%)
● Acetic Acid (10%)	● Ether	● Nitric Acid (70%)	● Toluene
● Acetone	● Ethylamine	● Oxalic Acid	● Transformer Oil
● Aluminium Chloride	● Ethylene Glycol	● Ozone (Gas)	● 1,1,1-Trichloroethane
● Aniline	● Ethyl Ethanoate	● Paraffin oil	● Trichloroethylene
● Benzaldehyde	● Freon 32	● Petrol	● Turpentine
● Benzene	● Hydrochloric Acid (10%)	● Phenol	● Vegetable Oil
● Carbon tetrachloride	● Hydrochloric Acid (36%)	● Sea Water	● Vinyl Acetate
● Chlorine water	● Hydrogen Peroxide (35%)	● Silver Nitrate	● Water
● Chloroform	● Hydrogen Peroxide (87%)	● Skydrol	● White Spirit
● Citric Acid	● Lactic Acid	● Sodium Chloride	● Zinc Chloride
● Copper Sulphate	● Lubricating oil	● Sodium Hydroxide (10%)	
● Cresol	● Methanol	● Sodium Hydroxide (60%)	

The information above is given as a guide only and is based on published technical data and experience. The chemical resistance of the above products is dependant on factors such as chemical exposure, concentration of the chemical and temperature. The above chemicals are valid for a temperature of 23°C. Use of the above table is at the users own discretion and risk. Those using it must satisfy themselves that their application presents no health and safety risks. The end user should assess compatibility with their application and contact TTS for further information.

ADHERENCE TO THE CURRENT WIRING REGULATIONS BS7671 OR NEC WIRING REGULATIONS (FOR USA) IS STRONGLY ADVISED.

MINIMUM BEND RADIUS FOR FLEXING IS DEPENDANT UPON MINIMUM TEMPERATURE, BENDING FREQUENCY AND CHEMICAL ENVIRONMENT.

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Flammability

Test Type	Method / Standard	Requirement	Result	Unit
Oxygen Index	ISO 4589-2	% Oxygen to support combustion	51.9	%
Glow Wire Rating	IEC 60695	No Ignition to Extinguish with 30s	960	°C
Flammability	UL94	Vertical (V0, V2) or Horizontal (HB)	V0	
Flammability	IEC 61386-1	1Kw Burner @ 45°	Pass	Pass/Fail

Smoke

Test Type	Method / Standard	Requirement	Result	Unit
Smoke Density	NF X 10-702	Vos ₄	34.7	Pass
Smoke Density	NF X 10.702	D Max	290	Pass
Smoke Density	BS6853	A ₀ < 0.02	0.006	A ₀
Smoke Density	ISO - 5659-2	Ds Max < 100	46	None

Toxicity

Test Type	Method / Standard	Requirement	Result	Unit
Halogen Free	LUL	< 0.5%	Yes	Yes/No
Phosphorous Free	LUL	< 0.5%	Yes	Yes/No
Sulphur Free	LUL	< 0.5%	Yes	Yes/No
Toxicity	NFX70 - 100 1 / 2	CIT _{NLP}	0.07	None
Toxicity	BS 6853 D8.3	R	0.34	None

Fire Performance Overview

Property	Low Fire Hazard	Enhanced Low Fire Hazard	Super Low Fire Hazard	Inherent Low Fire Hazard
Property Oxygen Index ISO4589 BS6853 Smoke Density 3m ³ Zero Halogen Zero Phosphorus Zero Sulphur NFF16-102 EN45545-2	 LFH 32% ≥ OI ≥ 28% 0.02 ≤ A ₀ ≤ 0.03 ✓ ✓ ✓ I3F2 HL2	 ELFH OI ≥ 32% 0.0005 ≤ A ₀ ≤ 0.02 ✓ ✓ ✓ I2F2 HL3	 SLFH OI ≥ 32% A ₀ ≤ 0.005 ✓ ✓ ✓ I2F1 HL3	 ILFH Inherent Low Fire Hazard i.e Type , S, SS Metallic Conduit & Fit- tings

Pre Test Conditions

Duration	Standard	Temperature	Relative Humidity
168 (Hours)	IEC61386	23 (°C)	50 (%)