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Metallic Systems

SPLHCB Conduit

Technical Characteristics

Conforms to	BSI Kitemark KM-35161 Low voltage directive Enhanced EMI screen
Approvals and Standards	
Degree of mechanical protection	High flexibility - medium fatigue life
Degree of protection	IP68 - with TSPLB type A & B fittings IP66 - with TSPLB type A & B fittings
UV protection	Very High
Finish	Stainless Steel Braid
Application	Indoors / Outdoors - High EMI screen - liquid resistant, high abrasion resistance
Normal operating temperature range	Application / Min Temp / Max Temp Static / **- 65°C** / **+135°C** Dynamic / **- 45°C** / **+150 °C**
For use with - Fitting range	Type A & B
EMI performance	**High EMI Screen** **75dB @ 100MHz** **>100dB @ 1MHz** **<100dB @ 10MHz** **High EMI Screen** **101dB @ 1MHz** **75dB @ 100MHz** **55dB @ 1000MHz** **Over braid details** Tinned Copper wire (wire OD 0.28 to 0.30mm) 32 carriers, 8 wires per carrier, Approx, 90% braid cover
Testing data	See pages 3 & 4
Type of material	Galvanised steel core - thermoplastic rubber Jacket - Stainless Steel - AISI 316 over braid
Image	

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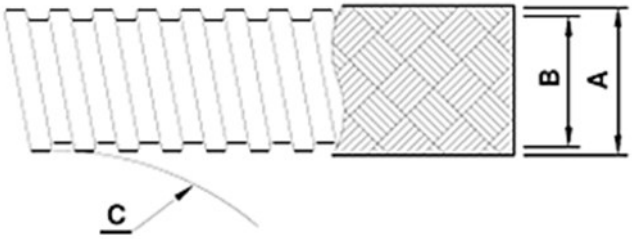
Technical & Dimensional Data

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	-	-	TSPLHCB	TSPLHCB	TSPLHCB	TSPLHCB	TSPLHCB	TSPLHCB	TSPLHCB	-
Coil length **(m)**	-	-	25	25	25	10	10	10	10	-
A - Outside diameter **(mm)**	-	-	19.8	23.1	28.4	35.1	44.0	56.0	68.0	-
B - Inside diameter **(mm)**	-	-	12.5	15.9	21.0	26.7	35.4	40.4	51.6	-
C - Static bend radius **(mm)**	-	-	80	95	115	145	180	240	350	-
Average weight **(KG/100m)**	-	-	29.4	38.5	48.7	67.7	108.5	115.76	150	-

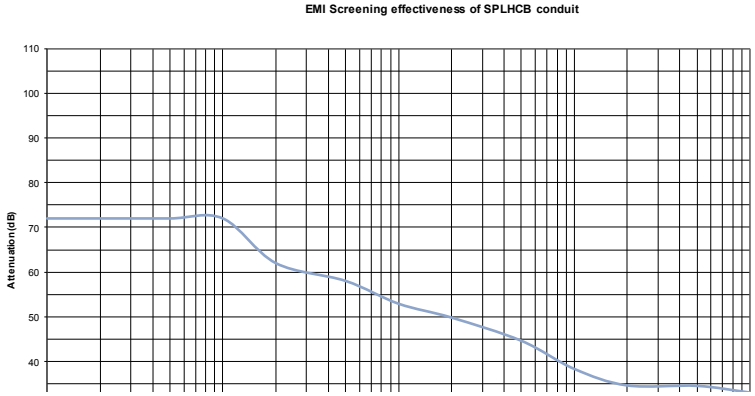
For ordering code add coil length to part code - e.g TSPLHCB20/25M



EMI Screen System

The graph below shows the results of STC20 screened conduit with its appropriate fittings tested to by ERA technology to IEC60096/2:93 (Radio frequency cables part 1).

Tests Measured attenuation in decibels (dB) over the frequency range covered by EMC directive 0.1 to 100MHz



For applications where electromagnetic interference is of particular concern, suitable conduit systems have been classified by means of symbols.

These are related in an ascending scale of performance as outlined in this explanation.

Symbol	Screen level	Explanation
STANDARD EMI SCREEN	**40db @ 100MHz Standard EMI Screen**	**Standard EMI Screen** (Products featuring a Stainless Steel overbraid)
ENHANCED EMI SCREEN	**60db @ 100MHz Enhanced EMI Screen**	**Enhanced EMI Screen** (Products featuring a Galvanised Steel overbraid)
HIGH EMI SCREEN	**75db @ 100MHz High EMI Screen**	**High EMI Screen** (Products featuring a tinned copper overbraid)

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BS EN 61386 Clarification

	Fitting	Compression	Impact	Min temp	Max temp	bending	electrical	IP solids	IP water	Corrosion	Tensile	Non-flame Propogating	Suspended load
TSPLHCB	TSPB	4	4	5	5	4	1	6	7	-	5	1	5

Mechanical Properties

Test Type	Methods / Standards	Requirements	Value
Crush Strength @ 23°C	IEC61386-1	<25% crush >90% recovery	>1250N (Class4)
Crush Strength @ 23 °C	AFX norm C1989	10% Crush, Instantaneous Value	2200N
Impact Strength @ 23 °C	IEC61386-1	No Cracks <20% deformation	>20J
Impact Strength @-45 °C	IEC61386-1	No Cracks. <20% deformation	>6J
Tensile Strength	IEC61386-1	With SPLB Type Fitting	>2500N class 4
Tensile Strength	AFX norm T1987	Ultimate pull-out of SPLB -Type Fitting	3500N
Dynamic Bend radius @ -45 °C	IEC61386-23	5000 cycles minimum	50mm

Thermal Properties

Test Type	Methods / Standards	Requirements	Value
Minimum Temperature	IEC61386-23	Dynamic 5000 cycles	-5°C
Maximum Temperature	IEC61386-23	Dynamic 5000 cycles	90°C
Minimum Static		Permanent Use	-15°C
Maximum Static		Permanent Use	70°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	22	%
Glow Wire Rating	IEC 60695	No Ignition to Extinguish with 30s	750	°C
Flammability	UL94	Vertical (V0, V2) or Horizontal (HB)	HB	
Flammability	IEC 61386-1	1Kw Burner @ 45°	Pass	Pass/Fail
FTI	ISO 4589-3		N/A	

Smoke

Test Type	Method / Standard	Requirement	Result	Unit
Smoke Density	ATS1000	In flaming mode <100 @ 4 mins	N/A	
Smoke Density	ATS1000	In non flaming mode <100 @ 4 mins	N/A	
Smoke Density	BS6853	A <0.02	N/A	
Smoke Density	ASTM E-662	Flaming mode D_S Max	N/A	
Smoke Density	ISO - 5659-2	D_S Max	N/A	

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
NFX 70-100	NFX70 - 100 1 / 2	CIT_{NLP}	N/A	N/A

Fire Performance Overview

Property	Low Fire Hazard	Enhanced Low Fire Hazard	Super Low Fire Hazard	Inherent Low Fire Hazard
				
Property	LFH	EFLH	SLFH	ILFH
Oxygen Index ISO4589	32% ≥ OI ≥ 28%	OI ≥ 32%	OI ≥ 32%	Inherent Low Fire Hazard i.e Type , S, SS , STC,SSB Metallic Conduit & Fittings
BS6853 Smoke Density 3m³	0.02 ≤ A_o ≤ 0.03	0.0005 ± A_o ≤ 0.02	A_o ≤ 0.005	
Zero Halogen	✓	✓	✓	
Zero Phosphorus	✓	✓	✓	
Zero Sulpher	✓	✓	✓	
NFF16-102	I3F2	I2F2	I2F1	
EN45545-2	HL2	HL3	HL3	

Pre Test Conditions

Duration	Standard	Temperature	Relative Humidity
168 (Hours)	EN50086/IEC61386	23 (^{0}C)	50 (%)