

# Metallic Systems

## SPB 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	IP54 - with SPB type A & B fittings		
UV protection	Very High		
Finish	Braid material colour		
Application	Indoors / Outdoors - Enhanced EMI screen - high abrasion resistance		
Normal operating temperature range	Application	Min Temp	Max Temp
	Static	- 15°C	+70°C
	Dynamic	- 5°C	+90 °C
For use with - Fitting range	<a href="#">Adaptasteel</a> - Type <a href="#">A</a> & <a href="#">B</a>		
EMI performance	<b>Standard EMI Screen</b> 62dB @ 100MHz	<100dB @ 1MHz <100dB @ 10MHz	
	<b>Standard EMI Screen</b> 74dB @ 1MHz	62dB @ 100MHz 34dB @ 1000MHz	
	<b>Over braid details</b> Galvanised steel over braided (wire OD 0.28 to 0.30mm) 32 carriers, 7 wires per carrier, Max O/D 22.0mm Approx, 90% braid cover		
Testing data	Click or See pages <a href="#">3</a> & <a href="#">4</a>		
Type of material	Galvanised steel core - PVC Jacket - Galvanised steel over braid		

Image



# Metallic Systems

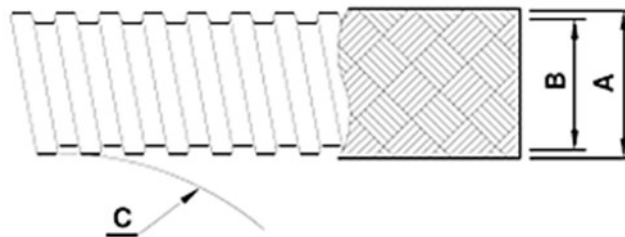
## SPB Conduit



### 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	SPB	SPB	SPB	SPB	SPB	SPB	SPB	SPB	-	-
Coil length (m)	25	25	25	25	25	10	10	10	-	-
A - Outside diameter (mm)	10	14.0	17.5	21.5	26.0	34.0	43.6	56.0	-	-
B - Inside diameter (mm)	6.8	10.3	13.0	16.9	21.4	28.1	37.7	48.4	-	-
C - Static bend radius (mm)	25	30	35	45	55	60	80	90	-	-
Average weight (KG/100m)	10	11.6	18.2	23.6	28	46.92	74.9	93.9	-	-

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



### EMI Screen System

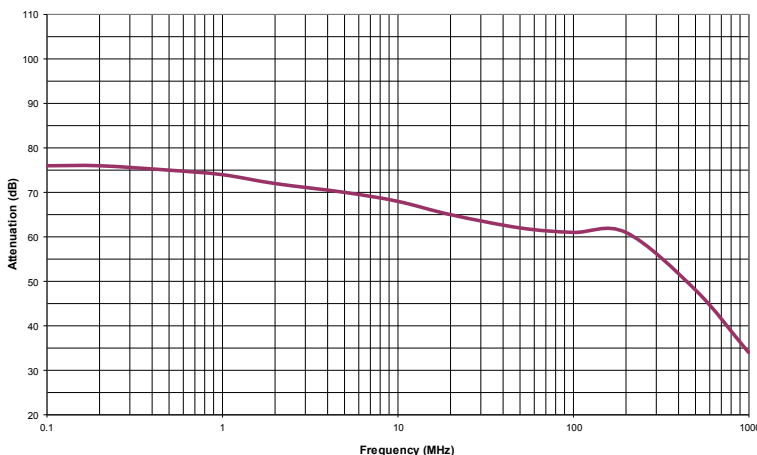
The graph below shows the results of STC20 screened conduit with its appropriate fittings tested to by ERA technology to IEC60096/2:93 (Radio frequency cables part 1).

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, Adaptaflex have classified suitable conduit systems by means of symbols.

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

EMI Screening effectiveness of SPB conduits



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

# Metallic Systems

## SPB Conduit



### BS EN 61386 Clarification

	Fitting	Compression	Impact	Min temp	Max temp	bending	electrical	IP solids	IP water	Corrosion	Tensile	Non-flame Propogating	Suspended load
SPB	SPB	4	4	2	2	4	3	5	4	-	4	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 A Type Fitting	>1000N class 4
Tensile Strength	AFX norm T1987	Ultimate pull-out of A-Type Fitting	1450N
Dynamic Bend radius @ -5 °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 : ●

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

# Metallic Systems

## SPB Conduit



### Flammability

Test Type	Method / Standard	Requirement	Result	Unit
Oxygen Index	ISO 4589-2	% Oxygen to support combustion	28	%
Glow Wire Rating	IEC 60695	No Ignition to Extinguish with 30s	850	°C
Flammability	UL94	Vertical (V0, V2) or Horizontal (HB)	V0	
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 Ds Max	N/A	
Smoke Density	ISO - 5659-2	Ds Max	N/A	

### Toxicity

Test Type	Method / Standard	Requirement	Result	Unit
Halogen Free	LUL	<0.5%	No	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 <sub>NLP</sub>	N/A	N/A

### Fire Performance Overview

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

### Pre Test Conditions

Duration	Standard	Temperature	Relative Humidity
168 (Hours)	EN50086/IEC61386	23 (°C)	50 (%)