

# Non-Metallic Systems

## PKSS High Specification Braided Conduit



### Technical Characteristics

Conforms to	BSI Kitemark KM-35161 CE mark to the Low voltage directive London Underground Category Extensive and Grouped NFF16-101 rating I2, F1 BS 6853 rating 1a
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Approvals and Standards	   
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Degree of mechanical protection	High flexibility & fatigue life
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Degree of protection	IP66 - Hi-Spec Type A & B IP67 - Hi-Spec Type A & B
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UV protection	Very High
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Finish	Stainless Steel Braiding
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Application	Extreme temperature applications and underground stations and tunnels, trackside and exposed areas where high impact and abrasion resistance is required.
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Normal operating temperature range	Application	Min Temp	Max Temp
	Static	- 60°C	+260°C
	Dynamic	- 45°C	+260°C

For use with - Fitting range	Hi - Spec Type <a href="#">A</a> & <a href="#">B</a>
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Fire performance & EMI Screen	Test Standard	Performance Rating	
	ISO 4589-2	40%	Self Extinguishing & halogen Free
	NFF16-101	I2, F1	
	BS 6853	Class 1a	
	LUL	Extensive & Grouped	
	UL94	V0	



Testing data	Click or See pages <a href="#">3</a> & <a href="#">4</a>
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Type of material	Polyetheretherketone - Super low fire hazard , Stainless Steel 316 braiding
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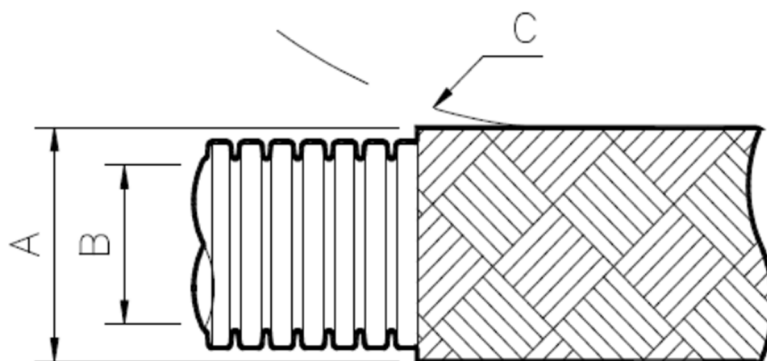
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### Technical & Dimensional Data

Part No.	Conduit Size			Dimensions				Average Weight (Kg/100m)
	Nominal Conduit Size	NW Conduit Size	Conduit Pitch	(A) Outside Diameter	(B) Inside Diameter	(C) Min. Bend Radius	Reel Length (m)	
PKFSSS13	13mm	10	Fine	14.1mm	10.0mm	45mm	25, 50	2.5
PKFSSS16	16mm	13	Fine	17.2mm	11.7mm	55mm	25, 50	2.9
PKFSSS21	21mm	17	Fine	23.6mm	16.6mm	70mm	25, 50	4.4
PKCSSS28	28mm	23	Coarse	30.0mm	21.7mm	85mm	25, 50	6.0
PKCSSS34	34mm	29	Coarse	36.0mm	27.7mm	100mm	25, 50	12.0

To order quote part number, colour & reel length, e.g. PKFSSS21/BL/50M



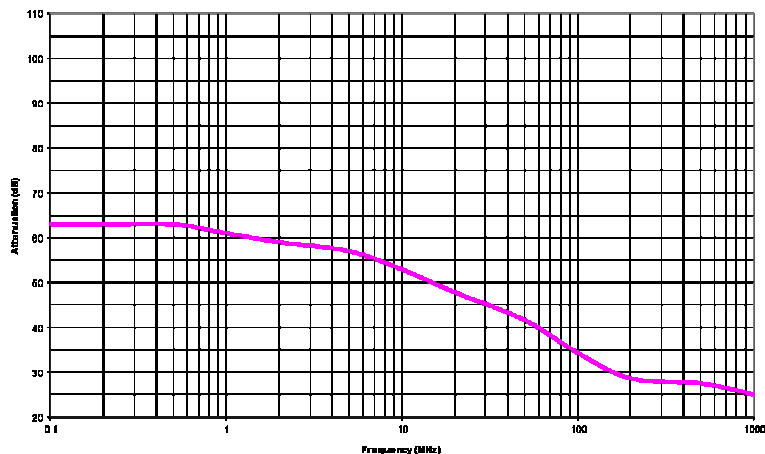
### EMI Screen System




The graph to the right shows the results of PKFSTC21 screened conduit, with its appropriate fittings, tested by ERA technology, to IEC60096/2:93 (radio frequency cables part 1). Tests measured attenuation in decibels (dB) over the frequency range covered by the EMC directive, 0.1 to 1000MHz.

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 PKSSS conduits



- |   |   |   |
|---|---|---|
|  | <b>40db @ 100MHz</b><br>Standard EMI Screen | <b>Standard EMI Screen</b><br>(Products featuring a Stainless Steel overbraid)  |
|  | <b>60db @ 100MHz</b><br>Enhanced EMI Screen | <b>Enhanced EMI Screen</b><br>(Products featuring a Galvanised Steel overbraid) |
|  | <b>75db @ 100MHz</b><br>High EMI Screen     | <b>High EMI Screen</b><br>(Products featuring a tinned copper overbraid)        |

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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
PKFSSS	PB	2	4	5	6	4	3	6	7	-	3	1	0

### Mechanical Properties

Test Type	Methods / Standards	Requirements	Value
Crush Strength	IEC61386-1	<25% crush >90% recovery	>320N
Tensile Strength	IEC61386-1	Pull off of fitting minimum value	>500N
Impact Strength @-45 °C	IEC61386-1	No Cracks <20% deformation min value	>6.0J
Static Bend Radius		21mm size	70mm
Dynamic Bend radius @-45 °C	IEC61386-23	5000 cycles minimum	4xOD

### Thermal Properties

Test Type	Methods / Standards	Requirements	Value
Minimum Temperature		Permanent Use (30,000 hours)	-60°C
Maximum Temperature		Permanent Use (30,000 hours)	-260°C
Maximum Short Term Temp		Peak (3000 hours)	300°C
Cold Bend @-40°C		Mandrel Diameter	3xOD
Heat Load Test @250°C	IEC61386-1	Weight @ crush classification 48hrs	Pass

### Chemical Resistance Chart

Key:	Green	Yellow	Red	Black
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 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.

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### Flammability

Test Type	Method / Standard	Requirement	Result	Unit
Oxygen Index	ISO 4589-2	% Oxygen to support combustion $\geq 34\%$	40	%
Glow Wire Rating	IEC 60695	No Ignition to Extinguish within 2s	960	°C
Flammability	UL94	Vertical (V0) or Horizontal (HB)	V0	HB/V0
Flammability	IEC 61386-1	Self Extinguishing <30s	0s	Seconds
Flammability	NF F16-101	Glow Wire & oxygen index	I2	-
Flammability	ISO 4589-3	Flammability temperature index $\geq 300^{\circ}\text{C}$	360	°C





### Smoke

Test Type	Method / Standard	Requirement	Result	Unit
Fume Rating	NF F16-101	Smoke & Toxicity	F1	-
Smoke Density	BS6853 Annex D	$A_o < 0.02$	0.00148	$A_o$
Smoke Density	ASTM E-662	$D_s < 100$ in both modes	10	$D_s \text{ Max}$

### Toxicity

Test Type	Method / Standard	Requirement	Result	Unit
Halogen Free	LUL	$< 0.5\%$	$< 0.1\%$	Yes/No
Phosphorous Free	LUL	$< 0.5\%$	$< 0.1\%$	Yes/No
Sulphur Free	LUL	$< 0.5\%$	$< 0.1\%$	Yes/No
Toxicity	NES713 Issue 3	$< 10.0$	0.22	

### 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	$32\% \geq OI \geq 28\%$	$OI \geq 32\%$	$OI \geq 32\%$	Inherent Low Fire Hazard i.e
BS6853 Smoke Density $3m^3$	$0.02 \leq A_o \leq 0.03$	$0.0005 \pm A_o \leq 0.02$	$A_o \leq 0.005$	Type , S, SS
Zero Halogen	✓	✓	✓	Metallic Conduit & Fittings
Zero Phosphorus	✓	✓	✓	
Zero Sulphur	✓	✓	✓	
NFF16-101	I3F2	I2F2	I2F1	
EN45545-2	HL2	HL3	HL3	

### Pre Test Conditions

Duration	Standard	Temperature	Relative Humidity
168 (Hours)	BS EN IEC 61386-1	23 (°C)	50 (%)

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