

Metallic Systems

SPUL Conduit



Technical Characteristics

Conforms to	UL listed E76358 CSA approved 048689
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Approvals and Standards



Degree of mechanical protection	Medium flexibility & fatigue life
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Degree of protection	IP67 - with SPL type A, B & M fittings IP66 - with SPL type M & C90 fittings
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UV protection	High (Grey) Very High (Black)
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Finish	Grey, Black
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Application	Liquid tight - US market
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Normal operating temperature range	Application	Min Temp	Max Temp
	Static	- 20°C	+105°C
	Dynamic	- 5°C	+105 °C

For use with - Fitting range	Adaptasteel - Type A , B , E , M C90 & 45
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Fire performance	Test Standard	Performance Rating	(See Fire testing data for fire performance overview)
	ISO-4589-2	28%	
	IEC60695	850°C	
	UL94	Vo	
	IEC 61386-1	Pass	

Testing data	Click or See pages 3 & 4
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Type of material	Heavy Galvanised steel core - copper packing with PVC covering
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Image



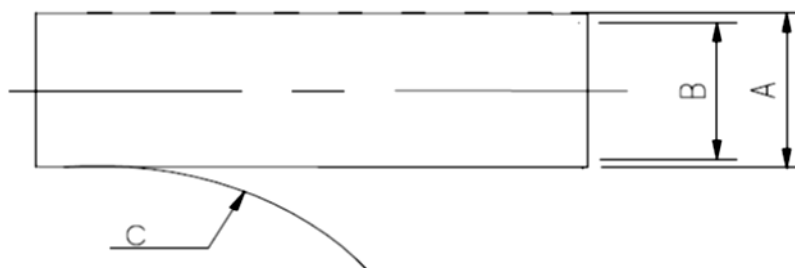
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Technical & Dimensional Data

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	-	-	SPUL	SPUL	SPUL	SPUL	SPUL	SPUL	SPUL	-
Coil length (m)	-	-	50	50	25	25	25	25	1025	-
A - Outside diameter (mm)	-	-	17.8	21.1	26.4	33.1	41.8	47.7	60.0	-
B - Inside diameter (mm)	-	-	12.5	15.9	21.0	26.7	35.4	40.4	51.6	-
C - Static bend radius (mm)	-	-	50	80	105	165	200	280	355	-
Average weight (KG/100m)	-	-	36	52	85.3	-	-	-	-	-
<i>For ordering code add coil length to part code - e.g SPUL25/BL/25M</i>										



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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 Propagating	Suspended load
SPUL	SPL(M)	4	4	2	5	4	0	6	7	-	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	AFX norm C1989	10% Crush, Instantaneous Value	2500N
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 class 4
Tensile Strength	AFX norm T1987	Ultimate pull-out of M-Type Fitting	1600N
Dynamic Bend radius @ -5 °C	IEC61386-23	5000 cycles minimum	160mm

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	105°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 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	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

Pre Test Conditions

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

SPUL Temperature Ratings

The maximum and minimum operating temperatures are defined by the PVC coating.

For UL standard UL360 the rating is
UL -10°C to 60°C

For CSA standard CSA22.2 part 56 the rating is
CSA -25°C to +75°C

For IEC61386 the temperature for flexing operation is
-5°C to +105°C

For low term static operation according to the material
the temperature is -20°C to +105°C

How the temperature is defined

The PVC used for SPUL is a high temperature grade and will operate in the temperature range -20°C to 105°C

Different standards specify different test criteria and we can only claim temperature ranges that apply

UL360 and CSA22.2 part 56 define the high working temperature by its resistance to oil immersion and the cold working temperature by forming around a mandrel

In UL360 for a rating of 60°C dry wet and oil use the covering must retain 70% of its tensile and elongation properties after immersion in ASTM No2 oil for 168 hours at 60°C ofr oil use plus 168 hours at 100°C for dry and wet use
The cold test is performed by exposing the conduit to -10C for 1 hour then forming around a specific mandrel size without damage

In CSA 2.2 part 56 for a rating of 75°C the covering must retain 75% of its tensile and elongation properties after immersion in ASTM No2 oil for 4 hours at 80°C
The low temperature is determined by an impact and cold bend test around a specific mandrel size, after the conduit has been stored at the minimum temperature for 4 hours

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