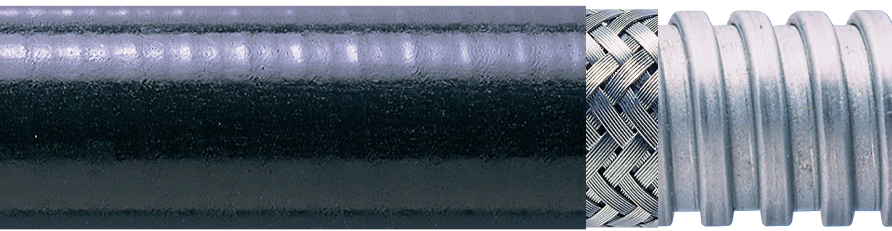


# Type EMIEF-SPL

## Enhanced fire performance - Under-braided liquid tight conduit



Liquid tight, enhanced fire performance, under-braided, covered galvanised steel flexible conduit. Suitable for a wide temperature operating range.

**Certifications / Standards:**  
(Refer to tables for certifications details)



EN45545-2

**Fire performance / EMC:**



**Features & benefits:**

- Low fire hazard jacket covered galvanised steel braid over galvanised steel core
- High flexibility and medium fatigue life
- High chemical resistance levels
- Very high UV resistance
- Available in black only

**Applications:**

- OEM - assembly
- Underground rail and any train vehicle/infrastructure
- Construction - commercial and institutional buildings
- MOD
- Indoor & outdoor applications
- Any buildings & infrastructure where low smoke, low toxicity and EMI screening is required

**Temperature range:**

- Static applications: -40°C to +105°C (-4°F to +194°F)
- Moving applications: -30°C to +105°C (+23°F to +221°F)

**UV Resistance:**

- Very high

**Material / Materials / Finishes:**

- Galvanised steel core, string packing up to 32mm, interlocked core 40mm and above with galvanised steel overbraid
- Low fire hazard jacket

**Ingress protection:**

- For use with Adaptasteel Type SPL & SSPL - Type A, B, E, M C90 and C45 fittings
- IP66 - with SPL & SSPL Type M, C45 & C90 fittings
  - IP67 - with SPL & SSPL Type A, B, M, C45 & C90 fittings
  - IP68 - with SPL & SSPL Type M, C45 & C90 fittings (10 bar 30 mins)
  - IP69 - with SPL & SSPL Type M, C45 & C90 fittings

**Conforms to:**

- CE marked to Low Voltage Directive 2014/35/EU
- BSI Kitemark KM35161 to BS EN 61386
- London Underground 1-085
- EN45545-2 HL3 (R22, R23)
- NFPA130 / ASTM E 162, ASTM E 662 and Bombardier SMP 800-C

**Fire performance:**

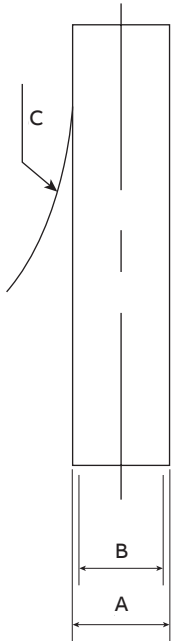
| Test standard | Performance rating |
|---------------|--------------------|
| EN 45545-2    | HL3 R22 & R23      |
| NF F16-101    | I3 F1              |
| UL94          | V0                 |
| BS 6853       | Class 1 A          |
| NFPA130       | Compliant          |

**Degree of mechanical protection:**

- High flexibility and medium fatigue life

**Chemical resistance:**

- High chemical resistance levels



## Type EMIEF-SPL Conduit – Part numbers and dimensions

| Part No.    | Conduit size |          |    | Dimensions (mm)  |                 |               |
|-------------|--------------|----------|----|------------------|-----------------|---------------|
|             | IEC/EN (mm)  | US / CAN |    | Outside Dia. (A) | Inside Dia. (B) | Bend radi (C) |
|             |              | in       | mm |                  |                 |               |
| EMIEF-SPL16 | 16           | 3/8"     | 12 | 17.9             | 12.3            | 100           |
| EMIEF-SPL20 | 20           | 1/2"     | 16 | 21.3             | 15.8            | 120           |
| EMIEF-SPL25 | 25           | 3/4"     | 21 | 26.5             | 20.8            | 140           |
| EMIEF-SPL32 | 32           | 1"       | 27 | 33.2             | 26.5            | 180           |
| EMIEF-SPL40 | 40           | 1 1/4"   | 35 | 42.0             | 35.0            | 230           |
| EMIEF-SPL50 | 50           | 1 1/2"   | 41 | 48.0             | 40.0            | 260           |
| EMIEF-SPL63 | 63           | 2"       | 53 | 60.5             | 51.3            | 330           |

Part number example: To order quote part number, colour & conduit coil length, e.g. EMIEF-SPL16/BL/25m.

## BS EN 61386 Classification

| Type      | Fitting | Compression | Impact | Min. Temp | Max. Temp | Bending | Electrical |
|-----------|---------|-------------|--------|-----------|-----------|---------|------------|
| EMIEF-SPL | SPL (M) | 4           | 4      | 2         | 3         | 4       | 2          |

| Type      | Fitting | IP Solids | IP Water | Corrosion | Tensile | Non-flame propgating | Suspended load |
|-----------|---------|-----------|----------|-----------|---------|----------------------|----------------|
| EMIEF-SPL | SPL (M) | 6         | 9        | -         | 4       | 1                    | 5              |

Tensile tests to IEC 61386 gives the minimum classification value only. Actual values will depend on the type and size of the fittings used and will always be greater than the minimum. Impact strength is the minimum classification value at the minimum temperature. Actual values will depend on size and temperature. Specific values available on request.

## Mechanical properties

| Test type                  | Standard    | Requirement                        | Status |
|----------------------------|-------------|------------------------------------|--------|
| Crush strength @ 23°C      | IEC61386-1  | <25% crush >90% recovery           | >1250N |
| Crush strength @ 23°C      | -           | 10% crush, instantaneous value     | 1800N  |
| Tensile strength           | IEC61386-1  | With Type M fitting                | >1000N |
| Tensile strength           | -           | Ultimate pullout of Type M fitting | 1600N  |
| Impact strength @ 23°C     | IEC61386-1  | No cracks <20% deformation         | >20J   |
| Impact strength @ -5°C     | IEC61386-1  | No cracks <20% deformation         | >6J    |
| Dynamic bend radius @ -5°C | IEC61386-23 | 5,000 cycles minimum               | 4xOD   |

## Thermal properties

| Test type             | Standard     | Requirement         | Value           |
|-----------------------|--------------|---------------------|-----------------|
| Min / Max temperature | IEC 61386-23 | Dynamic 5000 cycles | -40°C to +105°C |
| Min / Max static      | -            | Permanent use       | -30°C to +105°C |

## Flammability

| Test type    | Standard    | Requirement                          | Result | Value     |
|--------------|-------------|--------------------------------------|--------|-----------|
| Oxygen index | ISO 4589-2  | % Oxygen to support combustion       | 40.1   | %         |
| Glow wire    | IEC 60695   | No ignition to extinguish within 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     | Standard     | Requirement             | Result | Value          |
|---------------|--------------|-------------------------|--------|----------------|
| Smoke density | BS6853       | A <sub>0</sub> <0.02    | 0.0156 | A <sub>0</sub> |
| Smoke density | ISO - 5659-2 | D <sub>s</sub> Max <100 | 24     | Compliant      |

**Toxicity**

| Test type        | Standard                 | Requirement | Result | Value     |
|------------------|--------------------------|-------------|--------|-----------|
| 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         | EN45545-2 CIT NLP        | <100        | 0.06   | N/A       |
| Toxicity         | BS6853 Annex B.1 R Value | <1.0        | 0.32   | Compliant |

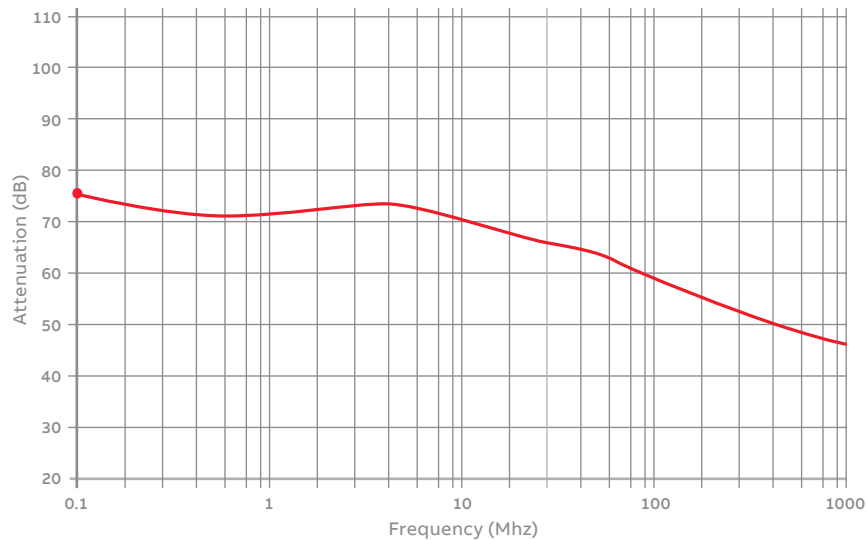
**Fire performance overview**

| 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 Metallic conduit & fittings                |
| BS6853 Smoke Density 3m <sup>3</sup> | 0.02 ≤ A. ≤ 0.03  | 0.0005 ± A. ≤ 0.02   | A. ≤ 0.005  |   |
| Zero Halogen                         | ✓   | ✓  | ✓   |   |
| Zero Phosphorus                      | ✓   | ✓  | ✓   |   |
| Zero Sulphur                         | ✓   | ✓  | ✓   |   |
| NFF16-102                            | I3F2  | I2F2   | I2F1  |   |
| EN45545-2                            | HL2   | HL3  | HL3   |   |

**Pre-test conditions**

| Duration  | Standard  | Temperature | Relative humidity |
|-----------|-----------|-------------|-------------------|
| 168 (hrs) | IEC 61386 | 23°C        | 50%               |

**EMC Screen level - EMI Screening effectiveness of EMIEF-SPL conduit**



The graph shows the results of EMIEF-SPL screened conduit, with its appropriate fittings.

The conduit is tested by ERA technology, to IEC 1196-1 Transfer Impedance.

Tests measured attenuation in decibels (dB) over the frequency range covered by the EMC directive, 100 kHz to 1 GHz.

Transfer Impedance was extrapolated to per metre transfer impedance and converted to give a shielding effectiveness, demonstrated by the graph.