# TISA-FLEX® EMI-PHY

EXTERNAL SHIELDING BRAID

**-40°C to +150°C**

## EUROPEAN PATENT NR 1 348 247

### FEATURES AND BENEFITS:

- **EMI-RFI: shielding protection 60dB [30MHz ; 100MHz]**
- **Expandable sleeve**
- **Excellent abrasion resistance**
- **Excellent vibration resistance**
- **Extremely lightweight**
- **Working temperature -40 +150°C**
- **Halogen free**
- **Very high flexibility**
- **Fray-resistant**
- **Tear-resistant**

## SPECIFIC PRODUCT EMI/RFI PROTECTION

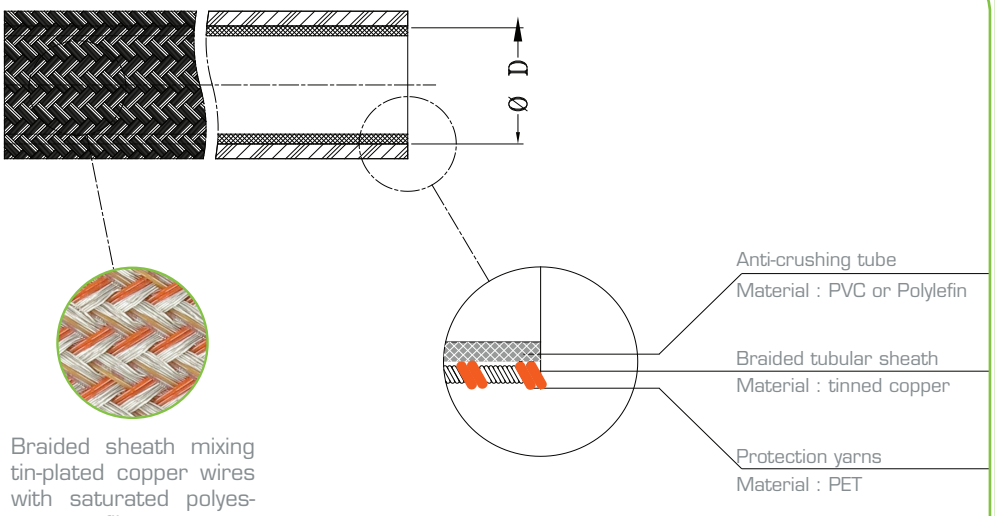
**TISA-FLEX® EMI-PHY** is an expandable EMI sleeving specifically designed for hybrid and electric vehicles.

The patented combination of thin copper wires and polyester monofilaments provides high electromagnetic shielding and mechanical protection.

The monofilaments are 2.5 times larger than copper wires, so the sleeve offers high abrasion protection both, inside for the cable insulation and, outside for external components which may come into contact with **TISA-FLEX® EMI-PHY**. The tight braided combination is tear-resistant, and increases the strength resistance.

With a low expansion ratio **TISA-FLEX® EMI-PHY** ensures high surface coverage and high shielding effectiveness.

**TISA-FLEX® EMI-PHY** is specifically designed to cover global shielding. Its structure allows crimping by stainless steel collars.




Braided sheath mixing tin-plated copper wires with saturated polyester monofilament yarns.

## PRODUCT :

The sheath is usually braided on an easily removable polyolefin or polyvinyl-chloride tube but it is also possible to produce the braided sleeve without the tube.

ISO 14001
ISO 9001
ISO/TS 16949
BUREAU VERITAS Certification

ISO 13485
BUREAU VERITAS Certification

RoHS · WEEE · COMPLIANT

TRESSE INDUSTRIE

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# TISA-FLEX® EMI-PHY

## PACKAGING :

Spools

## OPTIONS :

Other inner diameters and conductive wires : upon request.
Sheaths supplied in cut lengths : upon request
For sheath with UL94 V0 behaviour refer to **TISA-FLEX® EMI-PFR**

## HANDLING :

No special conditions. Refer to MSDS, upon request
It is advisable to wear protective gloves
Cold cut by scissors, no specific tool required

## APPLICATIONS :

The cables are simply pulled through **TISA-FLEX® EMI-PHY** which forms a smooth fit to contours.
A tighter fit on smaller cables can be obtained by stretching **TISA-FLEX® EMI-PHY** and securing with cable ties.
For effective shielding, both ends must be grounded and terminations can be made by metallic crimping collar.

## PART NUMBERING SYSTEM :

| Example description | Nominal inner diameter | Standard packaging |
|---|---|---|
| EMIPHY35/50 - BTS | 35 | 50m (cardboard spool) |
| EMIPHY35/250 | 35 | 250m (plactic spool) |

| REF | INNER DIAMETER | | | | Nominal wall thickness | Approx. Linear weight | Packaging Spool |
|---|---|---|---|---|---|---|---|
| | Nominal value | Range of use | | Tolerance | | | |
| | mm | min | max | (mm) | (mm) | (Kg/Km) | m |
| EMIPHY08 | 8* | 7 | 11.5 | +/- 1.5 | 0.50 | 35.70 | 50<br>100<br>250 |
| EMIPHY10 | 10* | 8 | 13 | +/- 1.5 | 0.50 | 43.0 | 50<br>100<br>250 |
| EMIPHY12 | 12** | 10 | 15 | +/- 2 | 0.50 | 44.5 | 50<br>100<br>250 |
| EMIPHY15 | 15** | 12 | 18 | +/- 3 | 0.50 | 68 | 50<br>100<br>250 |
| EMIPHY20 | 20 | 19 | 27 | +/- 4 | 0.50 | 72 | 50<br>100<br>250 |
| EMIPHY30 | 30 | 25 | 35 | +/- 4 | 0.50 | 101 | 50<br>250 |
| EMIPHY35 | 35 | 30 | 40 | +/- 4 | 0.50 | 120 | 50<br>250 |
| EMIPHY40 | 40 | 30 | 50 | +/-4 | 0.65 | 180 | 50<br>100 |
| EMIPHY50-60dB | 50 - (60dB) | 40 | 60 | +/- 5 | 0.67 | 204 | 50<br>100 |

| REF | Nominal value | Approx. linear resistance (nominal diameter) | ELECTROMAGNETIC COMPATIBILITY | | | |
|---|---|---|---|---|---|---|
| | | | Screening performance | | | |
| | mm | (mΩ/m) | Transfer impedance @ 30 MHz *(Note 1)* Nominal Zt (mΩ/m) | Shielding effectiveness *(Note 2)* | | |
| | | | | 300 MHz (dB) | 600 MHz (dB) | 1 GHz (dB) |
| EMIPHY08 | 8* | 8.8 | 79.5 | 56 | 53 | 50 |
| EMIPHY10 | 10* | 7.8 | 79.5 | 67 | 66 | 63 |
| EMIPHY12 | 12** | 6.5 | 39.8 | 65 | 64 | 60 |
| EMIPHY15 | 15** | 4.55 | 10 | 62 | 59 | 56 |
| EMIPHY20 | 20 | 4.30 | 100 | 48 | 48 | 48 |
| EMIPHY30 | 30 | 3.30 | 70.8 | 68 | 66 | 58 |
| EMIPHY35 | 35 | 2.60 | 39.8 | 71 | 63 | 58 |
| EMIPHY40 | 40 | 1.70 | 10 | 72.5 | 67 | 67 |
| EMIPHY50-60dB | 50 - (60dB) | 1.50 | 39.8 | 74 | 79 | 76 |

*Note 1 : In mode transfer impedance, triaxial method*

*Note 2 : In mode stirred reverberation chamber - load : 50 Ω*

* *Plastic former.*
** *Plastic former upon request*





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| EMIPHY35/250 | 35 | 250m (plactic spool) |

| INNER DIAMETER | | | | Nominal wall thickness | Approx. linear resistance (nominal diameter) | Shielding effectiveness Load 50 Ω (Note 1) | Approx. Linear weight | Packaging Spool |
|---|---|---|---|---|---|---|---|---|
| Nominal value | Range of use | | Tolerance | | | | | |
| mm | min | max | (mm) | (mm) | (m Ω/m) | (dB) | (Kg/Km) | m |
| 10* | 8 | 13 | +/- 1,5 | 0,50 | 7,8 | [300MHz;67dB]<br>[600MHz;66dB]<br>[1000MHz;63dB] | 43,0 | 50m<br>100m<br>250m |
| 12** | 10 | 15 | +/- 2 | 0,50 | 6,5 | [300MHz;65dB]<br>[600MHz;64dB]<br>[1000MHz;60dB] | 44,5 | 50m<br>100m<br>250m |
| 15** | 12 | 18 | +/- 3 | 0,50 | 4,55 | [300MHz;62dB]<br>[600MHz;59dB]<br>[1000MHz;56dB] | 68 | 50m<br>100m<br>250m |
| 20 | 19 | 27 | +/- 4 | 0,50 | 4,30 | [80MHz;61dB]<br>[100MHz;56dB]<br>[125MHz;56,5dB]<br>[150MHz;55,5dB] | 72 | 50m<br>100m<br>250m |
| 30 | 25 | 35 | +/- 4 | 0,50 | 3,30 | NA | 101 | 50m<br>250m |
| 35 | 30 | 40 | +/- 4 | 0,50 | 2,60 | [80MHz;85,11dB]<br>[100MHz;83,32dB]<br>[125MHz;75,79dB]<br>[150MHz;68,98dB] | 120 | 50m<br>250m |
| 40 | 30 | 50 | +/-4 | 0,65 | 1,70 | [70MHz;88dB]<br>[100MHz;82dB]<br>[150MHz;74dB] | 180 | 50m<br>100m |
| 50 | 40 | 60 | +/- 5 | 0,67 | 1,50 | NA | 193 | 50m<br>100m |

Note 1 : In mode stirred reverberation chamber
* Plastic former.
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