



## High Voltage Cable Jacket Material Solution

For Vehicle (TPU/TPO/LSZH)

## Application Advantages

### TPU

- **High temperature resistance:**

Fully support the high voltage wiring harness in the vehicle; passed the ISO 6722 125°C temperature resistance, flame retardant test; (secondary extrusion, insulation material is cross-linked polyolefin or silica gel, the outer sheath is TPU);

- **High Secure:**

Passed hydrolysis resistance test 2000 Hours ( 85°C&85%), the outstanding mechanical ability and resilience of TPU material , fully guaranteed the safety and reliability of high-voltage wire harness under long-term bending angle installation and operation.

- **Low Cost:**

High Voltage Wire Harness does not need Casing Bellows, which directly leads to the easier installation and less procedures, contributed to leads a cost-reduce on manufacturing and operating.

### TPO

The unique chemical cross-linking technology makes TPO material have the following obvious advantages in the application of sheath of high voltage wire harness:

- **Fully compliant to the standards of high-voltage wire products passing ISO6722 125°C temperature resistance and flame retardant test, no irradiation needed.**

- **Softer:**

Hardness  $\leq 80a$ , while fully meeting the performance requirements of high-voltage wire harness, it is more flexible than the cross-linking product and easier to install in narrow space.

- **Low Cost:**

Reduce manufacturing costs, only once extruding needed, without re-irradiation.

### LSZH

low smoke zero halogen cross-linked polyolefins

- **Fully meet the requirements of temperature resistance, flame retardant and other indicators of high-voltage wire harness passing ISO 6722 125 °C ISO6722 125 °C test.**

- **Fully support in-car high-voltage wire harness through 3000Hours copper aging test;**

- **Softer:**

Compared with the conventional cross-linking polyolefin materials used in high-voltage wire harness sheath on the market, it is more flexible ( $\leq 85A$ ), which is convenient for installation in narrow space.

## Properties Datasheet

|                                 |                                       |                  |                |                   | Model   | Model   | Model   |
|---------------------------------|---------------------------------------|------------------|----------------|-------------------|---|---|---|
| <b>General characteristics</b>  | Material properties                   | Testing standard | Test condition | Units             | 1185D-EM  | 2885E   | 5851E-JSS-0003S   |
|                                 | Material category                     | -                | -              | -                 | TPU Polyether                                   | TPO   | LSZH  |
|                                 | Appearance (light/Semi-matte/Frosted) | -                | -              | -                 | Semi-matte                                      | Semi-matte  |   |
|                                 | Extrusion/injection                   | -                | -              | -                 | Extrusion                                       | Extrusion   |   |
| <b>Physical characteristics</b> | Hardness                              | DIN 53505        | 155            | Shore A           | 86  | 86  | 92  |
|                                 | Proportion                            | DIN 53479        | -              | g/cm <sup>3</sup> | 1.16  | 0.96  | 1.36  |
|                                 | Melt index                            | DIN 53735        | 230°C/5kg      | g/10min           | 2   | 3   |   |
|                                 | Brittle temperature                   | ISO 812          | -              | °C                | -60   | -50   | -40   |
| <b>Mechanical properties</b>    | Elongation                            | DIN 53504        | 200mm/min      | %                 | 600   | 600   | 280   |
|                                 | Tensile Strength                      | DIN 53504        | 200mm/min      | Mpa               | 30  | 15  | 11  |
|                                 | Tearing strength                      | DIN 53515        | 500mm/min      | KN/m              | 70  | 40  |   |
| <b>Hot air aging</b>            | Elongation retention rate             | DIN 53504        | 158°C/168h     | %                 | ≥75 ( 113°C )                                   | 125°C temperature resistance  | Elongation retention rate:110<br>Hot air aging : 135°C×168H   |
|                                 | Tensile strength retention            | DIN 53504        | 158°C/168h     | %                 | ≥75 ( 113°C )                                   |   | Tensile strength retention:90<br>Hot air aging : 135°C×168H   |
| <b>Electrical performance</b>   | Volume resistivity                    | ASTM D257        | -              | Ohm-cm            | ≥1.0E+11  | ≥1.0E+15  | 3.9×10 <sup>12</sup>  |
| <b>Combustion performance</b>   | Vertical burning test                 | UL 94            | 3.0/6.0mm      | -                 | V2(3.0mm)                                       | HB(3.0mm)   |   |
| <b>Feature</b>                  |                                       |                  |                |                   | Charging pile/robot cable through IEC 60331-1-2 | Flame retardant TPE high voltage wire without PPO component, in accordance with IEC 60331-1-2 | Irradiated cross-linked low smoke halogen free flame retardant polyolefin insulation for charging piles |



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