

SEMITRON ESd 520HR has an industry first combination of electrostatic dissipation (ESd), high strength and heat resistance. This new ESd material is ideal for making nests, sockets and contactors for test equipment and other device handling components in the semiconductor industry. The key feature of SEMITRON ESd 520HR is its unique ability to resist dielectric breakdown at high voltages (>100V). Whereas for example typical carbon fiber enhanced products become irreversibly more conductive when exposed to even moderate voltages, SEMITRON ESd 520HR maintains its electrical performance throughout the voltage range 100 to 1000 V, while offering the mechanical performance needed to excel in demanding applications.

## Physical properties (indicative values\*)

| PROPERTIES                                  | Test methods ISO/(IEC) | Units             | VALUES                              |
|---|------------------------|-------------------|-------------------------------------|
| Colour                                      | —                      | —                 | khaki grey                          |
| Density                                     | 1183                   | g/cm <sup>3</sup> | 1.58                                |
| Water absorption:                           |                        |                   |                                     |
| - after 24 h immersion in water of 23°C (1) | 62                     | mg                | 56                                  |
|   | 62                     | %                 | 0.60                                |
| <b>Thermal Properties</b>                   |                        |                   |                                     |
| Melting temperature                         | —                      | °C                | NA                                  |
| Glass transition temperature                | —                      | °C                | 280                                 |
| Thermal conductivity at 23 °C               | —                      | W/(K·m)           | 0.36                                |
| Coefficient of linear thermal expansion:    |                        |                   |                                     |
| - average value between 23 and 100°C        | —                      | m/(m·K)           | 25·10 <sup>-6</sup>                 |
| - average value between 23 and 150°C        | —                      | m/(m·K)           | 25·10 <sup>-6</sup>                 |
| - average value above 150°C                 | —                      | m/(m·K)           | 25·10 <sup>-6</sup>                 |
| Temperature of deflection under load:       |                        |                   |                                     |
| - method A: 1.8 MPa                         | 75                     | °C                | 280                                 |
| Max. allowable service temperature in air:  |                        |                   |                                     |
| - for short periods (2)                     | —                      | °C                | 270                                 |
| - continuously: for min. 20,000 h (3)       | —                      | °C                | 250                                 |
| Flammability (4):                           |                        |                   |                                     |
| - "Oxygen Index"                            | 4589                   | %                 | 48                                  |
| - according to UL 94 (1.5/3 mm thickness)   | —                      | —                 | V-0/V-0                             |
| <b>Mechanical Properties at 23 °C</b>       |                        |                   |                                     |
| Tension test (5):                           |                        |                   |                                     |
| - tensile stress at break (6)               | 527                    | MPa               | 83                                  |
| - tensile strain at break (6)               | 527                    | %                 | 3                                   |
| - tensile modulus of elasticity (7)         | 527                    | MPa               | 5,500                               |
| Charpy impact strength – Notched            | 179/1eA                | kJ/m <sup>2</sup> | 4                                   |
| Rockwell hardness (8)                       | 2039-2                 | —                 | M 108                               |
| <b>Electrical Properties at 23 °C</b>       |                        |                   |                                     |
| Volume resistivity                          | (60093)                | Ω·cm              | 10 <sup>10</sup> - 10 <sup>12</sup> |
| Surface resistivity                         | (60093)                | Ω                 | 10 <sup>10</sup> - 10 <sup>12</sup> |

### Legend

- (1) According to method 1 of ISO 62 and done on discs Ø 50 x 3 mm.
- (2) Only for short time exposure (a few hours) in applications where no or only a very low load is applied to the material.
- (3) Temperature resistance over a period of min. 20,000 hours. After this period of time, there is a decrease in tensile strength of about 50% as compared with the original value. The temperature values given here are thus based on the thermal-oxidative degradation which takes place and causes a reduction in properties. Note, however, that the maximum allowable service temperature depends in many cases essentially on the duration and the magnitude of the mechanical stresses to which the material is subjected.
- (4) These mostly estimated ratings, derived from raw material supplier data, are not intended to reflect hazards presented by the materials under actual fire conditions. There is no UL-yellow card available for SEMITRON ESd 520HR stock shapes.
- (5) Test specimens: Type 1 B.
- (6) Test speed: 5 mm/min.
- (7) Test speed: 1 mm/min.
- (8) 10 mm thick test specimens.

- This table is a valuable help in the choice of a material. The data listed here fall within the normal range of product properties of dry material. **However, they are not guaranteed and they should not be used to establish material specification limits nor used alone as the basis of design.**

Note: 1 g/cm<sup>3</sup> = 1,000 kg/m<sup>3</sup>; 1 MPa = 1 N/mm<sup>2</sup>; 1 kV/mm = 1 MV/m

NA: not applicable

## Availability

**Plates:** Thicknesses 9.53-38.10 mm

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