# Technical Data Sheet

# EtroX® I CM natural

PI

## Typical characteristics

- Heat resistant
- High mechanical strength
- Low creep tendency
- High impact resistance
- High stiffness
- Good dimensional stability

## Typical industries

- Electronics
- Semiconductor Industry
- Aerospace
- Vehicle Construction
- Semiconductor Front-End applications
- Semiconductor Wafer Handling
- Semiconductor Back-End applications
- Semiconductor High and low temperature
- Semiconductor Dicing

| | Test method | Unit | Guideline value |
|---|---|---|---|
| **General properties** | | | |
| Density | DIN EN ISO 1183-1 | g / cm$^3$ | 1,37 |
| Water absorption | DIN EN ISO 62 (23°C / 24h) | % | 0,6 |
| Water absorption | DIN EN ISO 62 (23°C / 48h) | % | 0,8 |
| Water absorption | DIN EN ISO 62 (23°C / 3 Weeks) | % | 2,4 |
| **Mechanical properties** | | | |
| Elongation at break | DIN EN ISO 527 | % | 8 |
| Tensile modulus of elasticity | DIN EN ISO 527 | MPa | 3600 |
| Tensile strength | DIN EN ISO 527 | MPa | 145 |
| Notched impact strength | DIN EN ISO 179 | kJ / m$^2$ | 10 |
| Shore hardness | DIN EN ISO 868 | scale D | 89 |
| Ball indentation hardness | DIN EN ISO 2039-1 | MPa | 240 |
| Elastic modulus of compression | DIN EN ISO 604 | MPa | 4200 |
| Tensile creep modulus, 1h | ISO 899-1 | MPa | 3390 |
| Tensile creep modulus, 1000h | ISO 899-1 | MPa | 2730 |

| | Test method | Unit | Guideline value |
|---|---|---|---|
| **Thermal properties** | | | |
| Glass transition temperature | ISO 11357-3 | °C | 323 |
| Service temperature, short term (max.) | Average | °C | 380 |
| Mean coefficient of linear thermal expansion | ISO 11359-2 | $K^{-1}$ | 41 |
| Heat deflection temperature | DIN EN ISO 75 | °C | 319 |
| Temp. of deflection under load, 1.80 MPa | ISO 75-1/-2 | °C | 319 |
| Temp. of deflection under load, 0.45 MPa | ISO 75-1/-2 | °C | 343 |
| **Electrical properties** | | | |
| Volume resistivity | DIN EN 62631-3-1 | Ω * cm | $> 10^{15}$ |
| Dielectric constant @ 100Hz | IEC 60250 | | 4,2 |
| Dielectric constant @ 1kHz | IEC 60250 | | 4,2 |
| Dielectric constant @ 10kHz | IEC 60250 | | 4,1 |
| Dielectric constant @ 100 kHz | IEC 60250 | | 4,1 |
| Dielectric constant @ 10GHz | IEC 61189-2-721 | | 3,4 |
| Dielectric constant @ 40GHz | IEC 61189-2-721 | | 3,3 |
| Dielectric constant @ 100GHz | IEC 61189-2-721 | | 3,2 |
| Specific Volume resistivity | IEC 60093 | Ωm | $8*10^{13}$ |
| Specific Surface resistivity | IEC 60093 | Ω | $5*10^{15}$ |
| Relative permittivity, 100Hz | IEC 62631-2-1 | - | 3,5 |
| Relative permittivity, 1MHz | IEC 62631-2-1 | - | 3,4 |
| Dissipation factor, 1 MHz | IEC 62631-2-1 | E-4 | 80 |
| Electric strength | IEC 60243-1 | kV / mm | 34 |

The short-term maximum application temperature only applies to very low mechanical stress for a few hours. The long-term maximum application temperature is based on the thermal ageing of plastics by oxidation, resulting in a decrease of the mechanical properties. This applies to an exposure to temperatures for at least 5.000 hours causing a 50% loss of the tensile strength from the original value (measured at room temperature). This value says nothing about the mechanical strength of the material at high application temperatures. In case of thick-walled parts, only the surface layer is affected by oxidation from high temperatures. With the addition of antioxidants, a better protection of the surface layer is achieved. In any case, the center area of the material remains unaffected. The minimum application temperature is basically influenced by possible stress factors like impact and/or shock under application. The values stated refer to an minimum degree of impact stress. The electrical properties as stated result from measurements on natural, dry material. With other colours (in particular black) or saturated material, there may be clear differences in the electrical properties. The data stated above are average values ascertained by statistical tests on a regular basis. They are in accordance with DIN EN 15860. They serve as information about our products and are presented as a guide to choose from our range of materials. This, however, does not include an assurance of specific properties or the suitability for particular application purposes that are legally binding. Since the properties also depend on the dimension of the semi-finished products and the degree of crystallization (e.g. nucleating by pigments), the actual values of the properties of a particular product may differ from the indicated values.