

Polyethylene UHMW / PE 1000

PE 1000 has the best wear resistance of the polyethylene products due to its low coefficient of sliding friction and self-lubricating qualities. Its low density allows it to withstand exceptionally strong impacts. Good stress crack resistance enables this product to be used to a temperature limit of -200°C, this is the lowest operating temperature of all products.

Physical Properties (indicative values)

| GENERAL PROPERTIES | Test Method | Units | Value |
|--|---------------|--------------------|------------------------|
| Density | ISO 1183 | g/cm ³ | 0.93 |
| Water absorption | | | |
| - at saturation in air of 23°C / 50% R.H. | ISO 62 | % | 0 |
| - at saturation in water 23°C | ISO 62 | % | 0.1 |
| MECHANICAL PROPERTIES | | | |
| Tensile stress at yield and break | ISO 527 | N/mm ² | 19 |
| Elongation at break | ISO 527 | % | 50 |
| Tensile modulus of elasticity | ISO 527 | N/mm ² | 750 |
| Compression test | | | |
| - 1% strain after 1,000 hrs | ISO 899 | - | 6.5 |
| Charpy impact strength - Notched | ISO 179-1/1eU | KJ/mm ² | 115 |
| Charpy impact strength - Unnotched | ISO 179-1/1eA | KJ/mm ² | no break |
| Ball indentation hardness | ISO 2039 | N/mm ² | 33 |
| Shore hardness D | ISO 2039 | D | 60 |
| Coefficient of friction to steel ⁽¹²⁾ | ISO 8295 | - | 0.25 |
| THERMAL PROPERTIES | | | |
| Melting temperature | ISO 3156 | °C | 130 |
| Thermal conductivity at 23°C | ISO 22007.2 | W/9km) | 0.4 |
| Deformation temperature ⁽¹⁵⁾ | ISO 75 | °C | 45 |
| Coefficient of linear thermal expansion | | | |
| - average value between 23 and 60°C | ISO 11359 | m(m.K) | 150 x 10 ⁻⁶ |
| Max. allowable service temperature in air | | | |
| - Continuously ⁽¹⁷⁾ | - | °C | 80 |
| - Short periods ⁽¹⁸⁾ | - | °C | 120 |
| Minimum service temperature ⁽¹⁹⁾ | - | °C | -200 |
| Flamability | | | |
| - Oxygen index | ISO 4589 | % | 20 |
| - according to UL 94 (3/6 thickness) | UL94 | - | HB |
| ELECTRICAL PROPERTIES | | | |
| Dielctrical constant | ISO 250 | - | 2.3 |
| Dielectric strength | ISO 243 | KV/mm | 45 |
| Volume resistivity | ISO 93 | Ωcm | 10 ¹⁴ |
| Dissipation factor tan Δ at 1 MHz | ISO 250 | - | 0.001 |

Legend

- Figures relate to specimen conditioned at 23°C and 50 RH. Figures between brackets relate to dry specimen. Figures for materials marked with * can change according to their moisture content.
- Figures refer to un-coloured samples either injection moulded or machined in the easiest way. Tests made on samples of different sizes give slightly different results.
- ⁽¹²⁾ Test on ground steel dry specimen load 0.05 N/mm² speed =0.6 m/s
- ⁽¹⁵⁾ Deformation at temperature . HDT at 1.8 N/mm²
- ⁽¹⁷⁾ Operating temperature continuously 5000h. From 23°C upwards, the materials' features change in a non-uniform and disproportional way. The quoted limits are indicative and based on a tensile stress of 50% of the value at 23°C.
- ⁽¹⁸⁾ Operating temperature short period (no load).
- ⁽¹⁹⁾ The mechanical features decrease with a reduction in temperature and are also influenced by other factors (moisture, etc). The quoted values do not take into consideration impact conditions or heavy loads.

This table, is mainly to be used for comparison purposes. It's a valuable tool to help in the choice of material. The data listed here falls within the normal range of product properties. However, they aren't guaranteed and shouldn't be used to establish material specification limits nor used alone as the basis of design.

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