Kormax
ENABLING ENGINEERING VICTORIES

# Kormax UHMWPE

# Kormax Material Document

Kormax UHMWPE [short for Ultra high Molecular Weight Polyeythlene] has excellent chemical resistance, good fatigue and wear resistance. Specific gravity of polyeythlene is less than 1, hence is floats in water and is easy to identify. Kormax UHMWPE has excellent impact resistance and can be used in low temperatures down to -80°C. Most grades are non toxic and can be used in applications in direct contact with food and can be easily machined.

| | | | |
|---|---|---|---|
| **Max Continuous Operating Temperature** | **90°C** | **Density** | **0.93** |
| **Tensile Strength** | **4.1 MPa** | **Moisture Absorption** | **0.0%** |
| **Suitability for Food Contact** | **Yes** | **Machinability** | **Moderate** |
| **Coefficient of Friction to Steel** | **Excellent** | | |

| **Physical Properties** | Test Method | Unit | Value |
|---|---|---|---|
| Specific gravity (ρ) | ISO 1183 | g/cm³ | 0.93 |
| Water absorption [9] | ISO 62 | % | 0.5 |
| Humidity absorption [9] | ISO 62 | % | 0.01 |
| Maximum permissible service temp. [9] | UL746B | °C | 90 |
| Lower permissible service temp. [9] | UL746B | °C | -150 |

| **Mechanical Properties** | Test Method | Unit | Value |
|---|---|---|---|
| Tensile strength at yield ($\sigma_S$) | ISO 527 | MPa | 20 |
| Elongation at yield ($\varepsilon_S$) | ISO 527 | % | 20 |
| Tensile strength at break ($\sigma_R$) | ISO 527 | MPa | ≥ 40 |
| Elongation at break ($\varepsilon_S$) | ISO 527 | % | ≥ 50 |
| Impact strength ($a_n$) [9] | ISO 179 | kJ/m² | n.b. |
| Notch impact strength ($a_k$) [9] | ISO 179 | kJ/m² | n.b. |
| Ball indentation ($H_k$)/Rockwell hardness [9] | ISO 2039 | MPa | 38 |
| Shore-D | ISO 868 | - | 67 |
| Flexural strength ($\sigma_{B3,5\ \%}$) [9] | ISO 178 | MPa | 27 |
| Modulus of elasticity ($E_t$) | ISO 527 | MPa | 760 |

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| Thermal Properties [9] | | Test Method | Unit | Value |
|---|---|---|---|---|
| Vicat-softening point | VST/B/50 | ISO 306 | °C | 80 |
| | VST/A/50 | ISO 306 | °C | - |
| Heat deflection temperature | HDT/B | ISO 75 | °C | 65 |
| | HDT/A | ISO 75 | °C | 42 |
| Coef. of linear thermal expansion (α) | | ISO 11359 | $K^{-1} * 10^{-4}$ | 2 |
| Thermal conductivity at 20°C (λ) | | ISO 22007-4 | W/(m * K) | 0.41 |
| Glass transition temperature ($T_g$) | | ISO 3146 | °C | - |
| Melting temperature ($T_m$) | | ISO 3146 | °C | 133 |

| Electrical Properties | Test Method | Unit | Value |
|---|---|---|---|
| Volume resistivity ($\rho_D$) [8] | IEC 60093 | Ω*cm | $\geq 10^{13}$ |
| Surface resistivity ($R_o$) [8] | IEC 60093 | Ω | $\geq 10^{13}$ |
| Dielectric constant at 1MHz ($\varepsilon_r$) [9]) | IEC 60250 | - | 3 |
| Dielectric loss factor at 1 MHz (tanδ) [9] | IEC 60250 | - | 0.001 |
| Dielectric strength [9] | IEC 60243-1 | kV/mm | 45 |
| Tracking resistance [9] | IEC 60112 | V | CTI 600 |

| Additional Data | Test Method | Unit | Value |
|---|---|---|---|
| Bondability | - | - | - |
| Physiological indifference [5] according | EEC | - | + |
| | FDA | - | + |
| Flammability [8 9] | UL 94 | - | HB[7] |
| Limiting Oxygen Index (LOI) [8 9] | ASTM D2863 | % | 18 |
| UV stabilisation [6 8 9] | - | - | - |

[1] The physical data contained in this table are typical values and reflect the current state of our knowledge. The data are arithmetic average values which are tested by test specimens made out of rods (ø 40-60 mm). These has to be understood as guidelines, and shall not be used for specification purposes for finished parts. Missing data are completed by data of the raw materials.
[5] Physiological indifferences are valid for nature coloured materials on the raw material side. There are also approvals for our semi-finished products available or in preparation. Please check this separately with us. [6] Valid for nature coloured materials. An additional UV protection can be taken over by special pigments e.g. carbon black. [7] Test results without UL registration [8] Data are only valid for natural colours [9] Data taken from raw material *Self-assessment without test certificate * Own classification without official test report n.b. = No break + = yes o = Limited - = no / no data available

Notes for the user: The values given in this data sheet are based on a sheet with a 40mm thickness. Depending on the thickness the technical values may vary during processing.
The technical data given in this sheet correspond to our current state of knowledge and should not be construed as an agreement or guarantee regarding certain properties of our products. The decision on the suitability of a particular material for a specific application is up to the user. We reserve the right to modify the given data. Errors of the given data are reserved. The document was produced by machine and is valid without signature.