

## Ultra High Molecular Weight Polyethylene (UHMWPE) UTEC6540

### Description:

UTEC6540 is an Ultra High Molecular Weight Polyethylene with a molecular weight about 10 times higher than High Density Polyethylene (HDPE) resins. This extremely high molecular weight yields several unique properties to this polymer such as high abrasion resistance and impact strength and low coefficient of friction, what makes it a self-lubricating material.

### Applications:

Applications which require highest wear resistance – technical parts RAM extruded and compression molded sheets, rods and profiles.

### Physical Properties:

|                            | Method      | Units | Values  |
|----------------------------|-------------|-------|---------|
| Intrinsic Viscosity        | ASTM D 4020 | dL/g  | 28      |
| Average Molecular Weight   | Internal    | g/mol | 8.0x106 |
| Density                    | ASTM D 792  | g/cm3 | 0.925   |
| Bulk Density               | ASTM D 1895 | g/cm3 | 0.45    |
| Average Particle Size Dp50 | ASTM D 1921 | µm    | 205     |

### Mechanical Properties:

|  | Method                    | Units | Values         |
|--|---------------------------|-------|----------------|
| Tensile Strength at Yield                                | ASTM D 638<br>ISO 527     | MPa   | ≥ 17           |
| Tensile Strength at Break                                | ASTM D 638<br>ISO 527     | MPa   | > 30           |
| Ultimate Elongation                                      | ASTM D 638<br>ISO 527     | %     | > 300<br>> 350 |
| Notched Izod Impact Strength                             | ASTM D 256                | J/m   | No break       |
| Charpy Impact Strength*                                  | ISO 11542-2               | KJ/m2 | > 100          |
| Abrasion Index (reference ISO 15527 = 100)               | Sand slurry –<br>Internal | -     | 76             |
| Abrasion Index (reference Stainless Steel SAE1020 = 100) | Sand slurry -<br>Internal | -     | 20             |
| Static Friction Coefficient                              | ASTM D 1894               | -     | 0.10           |
| Kinetic Friction Coefficient                             | ASTM D 1894               | -     | 0.09           |
| Shore D Hardness   | ASTM D 2240<br>ISO 868    | -     | 64             |
| Shore D Hardness (15 sec)                                | ASTM D 2240<br>ISO 868    | -     | 59             |

\* Determined with double-notched specimens (14° v-notch on both sides) in accordance with ISO 11542-2.

**Data Sheet**

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**Thermal Properties:**

|   | Method                 | Units     | Values |
|---|------------------------|-----------|--------|
| Melt Temperature  | ASTM D 3418            | °C        | 133    |
| Vicat Softening Temperature at 1Kg                            | ASTM D 1525<br>ISO 306 | °C        | 128    |
| Heat Deflection Temperature                                   | ASTM D 648             | -         | -      |
| -- @ 0.45 N/mm <sup>2</sup>                                   | -                      | °C        | 79     |
| -- @ 1.81 N/mm <sup>2</sup>                                   | -                      | °C        | 48     |
| Thermal Conductivity @ 23°C                                   | ASTM D 177             | W/m.K     | 0.4    |
| Coefficient of Linear Expansion<br>(between – 30°C and 100°C) | ASTM D 696             | 10 -4 /°C | 1.5    |
| Specific Heat @ 23°C  | ASTM E 1269            | cal/g°C   | 0.48   |
| Specific Melt Enthalpy  | ASTM D 3418            | cal/g     | 34     |

**Electrical Properties:**

|                            | Method     | Units  | Typical Values |
|----------------------------|------------|--------|----------------|
| Volume Resistivity         | ASTM D 257 | ohm.cm | > 1014         |
| Surface Resistivity        | ASTM D 257 | ohm    | > 1012         |
| Dielectric Strength        | ASTM D 149 | kV/cm  | 900            |
| Dielectric Constant @ 1KHz | ASTM D 150 | -      | 2.3            |

**Other Properties:**

|                  | Method     | Units | Typical Values |
|------------------|------------|-------|----------------|
| Water Absorption | ASTM D 570 | %     | 0.01           |

**Final Remarks:**

1. This resin meets the requirements for olefin polymers as defined in 21 CFR, section 177.1520 issued by FDA – Food and Drug Administration in force on the date of publication of this specification. The additives present are covered in appropriate regulation by FDA
2. The information presented in this Data Sheet reflects typical values obtained in our laboratories, but should not be considered as absolute or as warranted values. Only the properties and values mentioned on the Certificate of Quality are considered as guarantee of the product.
3. In some applications, Braskem has developed tailor-made resins to reach specific requirements.
4. In case of doubt regarding utilization, or for other applications, please contact our Technical Assistance.
5. For information about safety, handling, individual protection, first aids and waste disposal, please see MSDS. CAS Registry number: 9002-88-4.
6. The mentioned values in this report can be changed at any moment without Braskem previous communication.
7. Braskem does not recommend this grade for packages, parts or any kind of product manufacture that will be used for storage or contact with solution that will have internal contact with human body.
8. The content of this Data Sheet replaces previous revisions published for this product.
9. This resin does not contain the substance Bisphenol A (BPA, CAS # No. 80-05-7) in its composition.