



ULTEM™ Resin AUT210

Americas: COMMERCIAL

Transparent, Thermoplastic Polyimide (TPI). Glass transition Temperature (Tg) of 227degC. Haze onset temperature of 212degC (SABIC IP method). Very low outgassing and plateout, for automotive lighting applications where highly metallized, reflective surfaces are required. Resin is a Dual-use item and is subject to export control restrictions under both U.S. 15 CFR , 774 and Annex I of Reg. (EC) 428/2009 as ECN 1C008. Diversion contrary to law is prohibited.

| TYPICAL PROPERTIES ¹ | TYPICAL VALUE | Unit | Standard |
|--|---------------|---------------------|-------------|
| MECHANICAL | | | |
| Tensile Stress, yld, Type I, 5 mm/min | 1070 | kgf/cm ² | ASTM D 638 |
| Tensile Stress, brk, Type I, 5 mm/min | 890 | kgf/cm ² | ASTM D 638 |
| Tensile Strain, yld, Type I, 5 mm/min | 8 | % | ASTM D 638 |
| Tensile Strain, brk, Type I, 5 mm/min | 75 | % | ASTM D 638 |
| Tensile Modulus, 5 mm/min | 36600 | kgf/cm ² | ASTM D 638 |
| Flexural Stress, yld, 1.3 mm/min, 50 mm span | 1730 | kgf/cm ² | ASTM D 790 |
| Flexural Modulus, 1.3 mm/min, 50 mm span | 33900 | kgf/cm ² | ASTM D 790 |
| Tensile Stress, yield, 5 mm/min | 103 | MPa | ISO 527 |
| Tensile Stress, break, 5 mm/min | 88 | MPa | ISO 527 |
| Tensile Strain, yield, 5 mm/min | 7 | % | ISO 527 |
| Tensile Strain, break, 5 mm/min | 54 | % | ISO 527 |
| Tensile Modulus, 1 mm/min | 3320 | MPa | ISO 527 |
| Flexural Modulus, 2 mm/min | 3140 | MPa | ISO 178 |
| IMPACT | | | |
| Izod Impact, unnotched, 23°C | 248 | cm-kgf/cm | ASTM D 4812 |
| Izod Impact, notched, 23°C | 3 | cm-kgf/cm | ASTM D 256 |
| Izod Impact, notched, -30°C | 3 | cm-kgf/cm | ASTM D 256 |
| Instrumented Impact Total Energy, 23°C | 336 | cm-kgf | ASTM D 3763 |
| Izod Impact, unnotched 80*10*4 +23°C | NB | kJ/m ² | ISO 180/1U |
| Izod Impact, unnotched 80*10*4 -30°C | NB | kJ/m ² | ISO 180/1U |
| Izod Impact, notched 80*10*4 +23°C | 5 | kJ/m ² | ISO 180/1A |
| Izod Impact, notched 80*10*4 -30°C | 4 | kJ/m ² | ISO 180/1A |

(1) Typical values only. Variations within normal tolerances are possible for various colors. All values are measured after at least 48 hours storage at 23°C/50% relative humidity. All properties, except the melt volume and melt flow rates, are measured on injection molded samples. All samples tested under ISO test standards are prepared according to ISO 294.

(2) Only typical data for selection purposes. Not to be used for part or tool design.
(3) This rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.

(4) Internal measurements according to UL standards.

(5) Measurements made from laboratory test coupon. Actual shrinkage may vary outside of range due to differences in processing conditions, equipment, part geometry and tool design. It is recommended that mold shrinkage studies be performed with surrogate or legacy tooling prior to cutting tools for new molded article.

(6) Needs hard coat to consistently pass 60 sec Vertical Burn.

Source GMD, last updated:

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| TYPICAL PROPERTIES ¹ | TYPICAL VALUE | Unit | Standard |
|--|---------------|-------------------------|--------------|
| IMPACT | | | |
| Charpy 23°C, V-notch Edgew 80*10*4 sp=62mm | 16 | kJ/m ² | ISO 179/1eA |
| THERMAL | | | |
| Vicat Softening Temp, Rate B/50 | 222 | °C | ASTM D 1525 |
| HDT, 0.45 MPa, 3.2 mm, unannealed | 215 | °C | ASTM D 648 |
| HDT, 1.82 MPa, 3.2mm, unannealed | 201 | °C | ASTM D 648 |
| HDT, 1.82 MPa, 6.4 mm, unannealed | 211 | °C | ASTM D 648 |
| CTE, -40°C to 150°C, flow | 5.E-05 | 1/°C | ASTM E 831 |
| CTE, -40°C to 150°C, xflow | 5.E-05 | 1/°C | ASTM E 831 |
| CTE, 23°C to 150°C, flow | 5.E-05 | 1/°C | ISO 11359-2 |
| CTE, 23°C to 150°C, xflow | 5.E-05 | 1/°C | ISO 11359-2 |
| Vicat Softening Temp, Rate B/50 | 221 | °C | ISO 306 |
| HDT/Ae, 1.8 MPa Edgew 120*10*4 sp=100mm | 196 | °C | ISO 75/Ae |
| Metallized Haze Onset | 212 | °C | SABIC Method |
| PHYSICAL | | | |
| Specific Gravity | 1.29 | - | ASTM D 792 |
| Mold Shrinkage, flow, 3.2 mm (5) | 0.5 - 0.7 | % | SABIC Method |
| Melt Flow Rate, 337°C/6.6 kgf | 11 | g/10 min | ASTM D 1238 |
| Density | 1.29 | g/cm ³ | ISO 1183 |
| Water Absorption, (23°C/sat) | 1.03 | % | ISO 62 |
| Moisture Absorption (23°C / 50% RH) | 0.2 | % | ISO 62 |
| Melt Volume Rate, MVR at 360°C/5.0 kg | 16 | cm ³ /10 min | ISO 1133 |

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(4) Internal measurements according to UL standards.

(5) Measurements made from laboratory test coupon. Actual shrinkage may vary outside of range due to differences in processing conditions, equipment, part geometry and tool design. It is recommended that mold shrinkage studies be performed with surrogate or legacy tooling prior to cutting tools for new molded article.

(6) Needs hard coat to consistently pass 60 sec Vertical Burn.

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| PROCESSING PARAMETERS | TYPICAL VALUE | Unit |
|-----------------------------|---------------|------|
| Injection Molding | | |
| Drying Temperature | 150 | °C |
| Drying Time | 4 - 6 | hrs |
| Drying Time (Cumulative) | 24 | hrs |
| Maximum Moisture Content | 0.02 | % |
| Melt Temperature | 380 - 405 | °C |
| Nozzle Temperature | 375 - 400 | °C |
| Front - Zone 3 Temperature | 380 - 405 | °C |
| Middle - Zone 2 Temperature | 370 - 395 | °C |
| Rear - Zone 1 Temperature | 360 - 380 | °C |
| Mold Temperature | 135 - 165 | °C |
| Back Pressure | 0.3 - 0.7 | MPa |
| Screw Speed | 40 - 70 | rpm |
| Shot to Cylinder Size | 40 - 60 | % |
| Vent Depth | 0.025 - 0.076 | mm |

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