

# ULTEM™ RESIN 4000

REGION ASIA

## DESCRIPTION

Glass fiber, PTFE, and Graphite filled, standard flow Polyetherimide (Tg 217C). ECO Conforming, UL94 V0 listing.

| INDUSTRY                   | SUB INDUSTRY  |
|----------------------------|---|
| Automotive                 | Heavy Truck, Automotive Under the Hood, Aerospace, Motorcycle, Recreational/Specialty Vehicles  |
| Building and Construction  | Building Component, Water Management  |
| Consumer                   | Consumer Goods, Sport/Leisure, Personal Accessory, Home Appliances, Commercial Appliance, Furniture   |
| Electrical and Electronics | Energy Management, Drone Solutions, Mobile Phone - Computer - Tablets, Circuit Boards/Additives, Lighting, Printer Copier, Speaker - Earphone, Wireless Communication |
| Hygiene and Healthcare     | Personal and Professional Hygiene, Pharmaceutical Packaging and Drug Delivery, Surgical devices, General Healthcare, Patient Testing                                  |
| Industrial                 | Electrical, Material Handling, Textile, Eyewear   |
| Mass Transportation        | Rail  |
| Packaging                  | Industrial Packaging  |

## TYPICAL PROPERTY VALUES

Revision 20231109

| PROPERTIES  | TYPICAL VALUES | UNITS     | TEST METHODS |
|---|----------------|-----------|--------------|
| <b>MECHANICAL</b>                                 |                |           |              |
| Tensile Stress, brk, Type I, 5 mm/min             | 82             | MPa       | ASTM D638    |
| Tensile Strain, brk, Type I, 5 mm/min             | 1.2            | %         | ASTM D638    |
| Flexural Stress, yld, 2.6 mm/min, 100 mm span     | 113            | MPa       | ASTM D790    |
| Flexural Stress, brk, 2.6 mm/min, 100 mm span     | 137            | MPa       | ASTM D790    |
| Flexural Modulus, 2.6 mm/min, 100 mm span         | 8820           | MPa       | ASTM D790    |
| Hardness, Rockwell M                              | 85             | -         | ASTM D785    |
| Taber Abrasion, CS-17, 1 kg                       | 33             | mg/1000cy | ASTM D1044   |
| PV Limit, 0.51 m/s                                | 2.1            | MPa-m/s   | SABIC method |
| K-factor xE-10, PV=2000 psi-fpm vs Steel          | 50             | -         | SABIC method |
| K-factor xE-10, PV=2000 psi-fpm vs Self           | 1900           | -         | SABIC method |
| Coefficient of Friction on steel, Static          | 0.25           | -         | ASTM D1894   |
| Coefficient of Friction on steel, Kinetic         | 0.24           | -         | ASTM D1894   |
| <b>IMPACT</b>                                     |                |           |              |
| Izod Impact, unnotched, 23°C                      | 160            | J/m       | ASTM D4812   |
| Izod Impact, notched, 23°C                        | 64             | J/m       | ASTM D256    |
| Izod Impact, Reverse Notched, 3.2 mm              | 170            | J/m       | ASTM D256    |
| <b>THERMAL</b>                                    |                |           |              |
| Vicat Softening Temp, Rate B/50                   | 233            | °C        | ASTM D1525   |
| HDT, 1.82 MPa, 6.4 mm, unannealed                 | 212            | °C        | ASTM D648    |
| CTE, -40°C to 40°C, flow                          | 1.62E-05       | 1/°C      | ASTM E831    |
| CTE, -20°C to 150°C, flow                         | 1.62E-05       | 1/°C      | ASTM E831    |
| Relative Temp Index, Elec <sup>(1)</sup>          | 105            | °C        | UL 746B      |
| Relative Temp Index, Mech w/impact <sup>(1)</sup> | 105            | °C        | UL 746B      |

| PROPERTIES  | TYPICAL VALUES                 | UNITS    | TEST METHODS |
|---|--------------------------------|----------|--------------|
| Relative Temp Index, Mech w/o impact <sup>(1)</sup> | 105                            | °C       | UL 746B      |
| <b>PHYSICAL</b>                                     |                                |          |              |
| Specific Gravity                                    | 1.67                           | -        | ASTM D792    |
| Water Absorption, (23°C/24hrs)                      | 0.11                           | %        | ASTM D570    |
| Mold Shrinkage, flow, 3.2 mm                        | 0.2 – 0.3                      | %        | SABIC method |
| Melt Flow Rate, 337°C/6.6 kgf                       | 3.1                            | g/10 min | ASTM D1238   |
| <b>ELECTRICAL</b>                                   |                                |          |              |
| Comparative Tracking Index (UL) {PLC}               | 4                              | PLC Code | UL 746A      |
| <b>FLAME CHARACTERISTICS <sup>(1)</sup></b>         |                                |          |              |
| UL Yellow Card Link                                 | <a href="#">E121562-221109</a> | -        | -            |
| UL Recognized, 94V-0 Flame Class Rating             | 0.84                           | mm       | UL 94        |
| <b>INJECTION MOLDING</b>                            |                                |          |              |
| Drying Temperature                                  | 135                            | °C       |              |
| Drying Time   | 4 – 6                          | Hrs      |              |
| Drying Time (Cumulative)                            | 10                             | Hrs      |              |
| Maximum Moisture Content                            | 0.02                           | %        |              |
| Melt Temperature                                    | 350 – 370                      | °C       |              |
| Nozzle Temperature                                  | 350 – 370                      | °C       |              |
| Front - Zone 3 Temperature                          | 350 – 370                      | °C       |              |
| Middle - Zone 2 Temperature                         | 345 – 365                      | °C       |              |
| Rear - Zone 1 Temperature                           | 340 – 360                      | °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       |              |

(1) UL Ratings shown on the technical datasheet might not cover the full range of thicknesses and colors. For details, please see the UL Yellow Card.

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