

# LEXAN™ 4504 resin

Polyphthalate Carbonate

SABIC Innovative Plastics

## Message:

High heat resistant polycarbonate copolymer, provides DTUL of 290F at 264 psi. FDA food contact compliant in limited colors. Effective January 15th, 2008 this grade will no longer be supported with biocompatibility information and should not be used for medical applications which require biocompatibility. Alternative grade HPH4504.

| General Information                        |                                      |           |                           |
|--------------------------------------------|--------------------------------------|-----------|---------------------------|
| Features                                   | Copolymer                            |           |                           |
|                                            | Food Contact Acceptable              |           |                           |
|                                            | High Heat Resistance                 |           |                           |
| Agency Ratings                             | FDA Food Contact, Unspecified Rating |           |                           |
| Processing Method                          | Injection Molding                    |           |                           |
| Physical                                   | Nominal Value                        | Unit      | Test Method               |
| Specific Gravity                           |                                      |           |                           |
| --                                         | 1.20                                 | g/cm³     | ASTM D792, ISO 1183       |
| --                                         | 1.19                                 | g/cm³     | ASTM D792                 |
| Specific Volume                            | 0.835                                | cm³/g     | ASTM D792                 |
| Melt Mass-Flow Rate (MFR) (300°C/1.2 kg)   | 3.0                                  | g/10 min  | ASTM D1238                |
| Melt Volume-Flow Rate (MVR) (300°C/1.2 kg) | 3.00                                 | cm³/10min | ISO 1133                  |
| Molding Shrinkage - Flow (3.20 mm)         | 0.70 to 0.80                         | %         | Internal Method           |
| Water Absorption                           |                                      |           |                           |
| 24 hr                                      | 0.16                                 | %         | ASTM D570                 |
| Saturation, 23°C                           | 0.16                                 | %         | ISO 62                    |
| Equilibrium, 23°C, 50% RH                  | 0.35                                 | %         | ISO 62                    |
| Hardness                                   | Nominal Value                        | Unit      | Test Method               |
| Rockwell Hardness                          |                                      |           | ASTM D785                 |
| M-Scale                                    | 85                                   |           |                           |
| R-Scale                                    | 122                                  |           |                           |
| Mechanical                                 | Nominal Value                        | Unit      | Test Method               |
| Tensile Modulus                            |                                      |           |                           |
| -- <sup>1</sup>                            | 2090                                 | MPa       | ASTM D638                 |
| --                                         | 2260                                 | MPa       | ISO 527-2/1               |
| Tensile Strength                           |                                      |           |                           |
| Yield <sup>2</sup>                         | 65.5                                 | MPa       | ASTM D638                 |
| Yield                                      | 65.0                                 | MPa       | ISO 527-2/5, ISO 527-2/50 |
| Break <sup>3</sup>                         | 71.7                                 | MPa       | ASTM D638                 |
| Tensile Elongation                         |                                      |           |                           |

|                                                    |               |                   |                          |
|----------------------------------------------------|---------------|-------------------|--------------------------|
| Yield <sup>4</sup>                                 | 7.0           | %                 | ASTM D638                |
| Yield                                              | 7.0           | %                 | ISO 527-2/50             |
| Break <sup>5</sup>                                 | 120           | %                 | ASTM D638                |
| Break                                              | 7.0           | %                 | ISO 527-2/50             |
| Flexural Modulus                                   |               |                   |                          |
| 50.0 mm Span <sup>6</sup>                          | 2030          | MPa               | ASTM D790                |
| -- <sup>7</sup>                                    | 2120          | MPa               | ISO 178                  |
| Flexural Stress                                    |               |                   |                          |
| --                                                 | 66.0          | MPa               | ISO 178                  |
| Yield, 50.0 mm Span <sup>8</sup>                   | 95.1          | MPa               | ASTM D790                |
| Impact                                             | Nominal Value | Unit              | Test Method              |
| Charpy Notched Impact Strength <sup>9</sup> (23°C) | 15            | kJ/m <sup>2</sup> | ISO 179/1eA              |
| Notched Izod Impact                                |               |                   |                          |
| -30°C                                              | 140           | J/m               | ASTM D256                |
| 23°C                                               | 640           | J/m               | ASTM D256                |
| -30°C <sup>10</sup>                                | 11            | kJ/m <sup>2</sup> | ISO 180/1A               |
| 23°C <sup>11</sup>                                 | 13            | kJ/m <sup>2</sup> | ISO 180/1A               |
| Unnotched Izod Impact (23°C)                       | 3200          | J/m               | ASTM D4812               |
| Instrumented Dart Impact (23°C, Total Energy)      | 73.0          | J                 | ASTM D3763               |
| Gardner Impact (23°C)                              | 149           | J                 | ASTM D3029               |
| Tensile Impact Strength <sup>12</sup>              | 578           | kJ/m <sup>2</sup> | ASTM D1822               |
| Thermal                                            | Nominal Value | Unit              | Test Method              |
| Deflection Temperature Under Load                  |               |                   |                          |
| 1.8 MPa, Unannealed, 3.20 mm                       | 143           | °C                | ASTM D648                |
| 1.8 MPa, Unannealed, 64.0 mm Span <sup>13</sup>    | 132           | °C                | ISO 75-2/Af              |
| Vicat Softening Temperature                        |               |                   |                          |
| --                                                 | 160           | °C                | ASTM D1525 <sup>14</sup> |
| --                                                 | 154           | °C                | ISO 306/B50              |
| --                                                 | 155           | °C                | ISO 306/B120             |
| CLTE                                               |               |                   |                          |
| Flow : -40 to 40°C                                 | 6.0E-5        | cm/cm/°C          | ASTM E831, ISO 11359-2   |
| Flow : -40 to 95°C                                 | 9.2E-5        | cm/cm/°C          | ASTM E831                |
| Transverse : -40 to 40°C                           | 6.0E-5        | cm/cm/°C          | ASTM E831, ISO 11359-2   |
| Specific Heat                                      | 1260          | J/kg/°C           | ASTM C351                |
| Thermal Conductivity                               | 0.21          | W/m/K             | ASTM C177                |
| RTI Elec                                           | 125           | °C                | UL 746                   |
| RTI Imp                                            | 125           | °C                | UL 746                   |
| RTI Str                                            | 125           | °C                | UL 746                   |
| Electrical                                         | Nominal Value | Unit              | Test Method              |
| Volume Resistivity                                 | > 2.6E+17     | ohms · cm         | ASTM D257                |
| Dielectric Strength (3.20 mm, in Air)              | 20            | kV/mm             | ASTM D149                |

|                                       |                   |           |             |
|---------------------------------------|-------------------|-----------|-------------|
| Dielectric Constant                   |                   | ASTM D150 |             |
| 50 Hz                                 | 3.15              |           |             |
| 60 Hz                                 | 3.15              |           |             |
| 1 MHz                                 | 3.00              |           |             |
| Dissipation Factor                    |                   | ASTM D150 |             |
| 50 Hz                                 | 1.2E-3            |           |             |
| 60 Hz                                 | 1.2E-3            |           |             |
| 100 Hz                                | 0.024             |           |             |
| Comparative Tracking Index (CTI)      | PLC 3             |           | UL 746      |
| High Amp Arc Ignition (HAI)           | PLC 4             |           | UL 746      |
| High Voltage Arc Tracking Rate (HVTR) | PLC 3             |           | UL 746      |
| Hot-wire Ignition (HWI)               | PLC 2             |           | UL 746      |
| Flammability                          | Nominal Value     | Unit      | Test Method |
| Flame Rating (1.47 mm)                | V-2               |           | UL 94       |
| Optical                               | Nominal Value     | Unit      | Test Method |
| Refractive Index                      | 1.600             |           | ASTM D542   |
| Transmittance (2540 μm)               | 85.0              | %         | ASTM D1003  |
| Haze (2540 μm)                        | 1.0               | %         | ASTM D1003  |
| Injection                             | Nominal Value     | Unit      |             |
| Drying Temperature                    | 121               | °C        |             |
| Drying Time                           | 3.0 to 4.0        | hr        |             |
| Drying Time, Maximum                  | 48                | hr        |             |
| Suggested Max Moisture                | 0.020             | %         |             |
| Suggested Shot Size                   | 40 to 60          | %         |             |
| Rear Temperature                      | 316 to 338        | °C        |             |
| Middle Temperature                    | 327 to 349        | °C        |             |
| Front Temperature                     | 338 to 360        | °C        |             |
| Nozzle Temperature                    | 332 to 354        | °C        |             |
| Processing (Melt) Temp                | 338 to 360        | °C        |             |
| Mold Temperature                      | 82.2 to 116       | °C        |             |
| Back Pressure                         | 0.345 to 0.689    | MPa       |             |
| Screw Speed                           | 40 to 70          | rpm       |             |
| Vent Depth                            | 0.025 to 0.076    | mm        |             |
| NOTE                                  |                   |           |             |
| 1.                                    | 5.0 mm/min        |           |             |
| 2.                                    | Type I, 50 mm/min |           |             |
| 3.                                    | Type I, 50 mm/min |           |             |
| 4.                                    | Type I, 50 mm/min |           |             |
| 5.                                    | Type I, 50 mm/min |           |             |
| 6.                                    | 1.3 mm/min        |           |             |
| 7.                                    | 2.0 mm/min        |           |             |
| 8.                                    | 1.3 mm/min        |           |             |

|     |                                    |
|-----|------------------------------------|
| 9.  | 80*10*4 sp=62mm                    |
| 10. | 80*10*4                            |
| 11. | 80*10*4                            |
| 12. | Type S                             |
| 13. | 80*10*4 mm                         |
| 14. | Rate B (120°C/h), Loading 2 (50 N) |

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