

Physical Properties of SUMIPEX<sup>®</sup> Optical Grade

| Item  | Test Method |                       | Unit              | Optical Grade        |
|---|-------------|-----------------------|-------------------|----------------------|
|   | ISO         | JIS                   |                   | EXN                  |
| <b>Optical Properties</b>                       |             |                       |                   |                      |
| Reflectic Index                                 | ISO 489     | JIS K7142             | -                 | 1.49                 |
| Total Light Transmission                        | ISO 13468-1 | JIS K7361-1           | %                 | 92                   |
| Haze  | ISO 14782   | JIS K7136             | %                 | <0.5                 |
| <b>Thermal Properties</b>                       |             |                       |                   |                      |
| Coeffecient of Linear Expansion                 | ISO 11359-2 | JIS K7197             | 1/°C              | 7 X 10 <sup>-5</sup> |
| Vicat Softening Temperature (VST)               | ISO 306     | JIS K7206 (B50)       | °C                | 104                  |
| Deflection Temp. Under Load 1.82 MPa (annealed) | ISO 75-2    | JIS K7191 (Af method) | °C                | 99                   |
| Melt Flow Rate (MFR) 230°C, 37.3N (3.8kgf)      | ISO 1133    | D-1238                | g/10min           | 1.5                  |
| <b>Mechanical Properties</b>                    |             |                       |                   |                      |
| Tensile Strength at break                       | ISO 527-2   | JIS K7162             | MPa               | 74                   |
| Tensile Strain at break                         | ISO 527-2   | JIS K7162             | %                 | 5                    |
| Flexural Strength                               | ISO 178     | JIS K7171             | MPa               | 120                  |
| Flexural Modulus                                | ISO 178     | JIS K7171             | MPa               | 3100                 |
| Charpy Impact Strength (notched)                | ISO 179-1   | JIS K7111             | KJ/m <sup>2</sup> | 1.4                  |
| Rockwell Hardness Scale M                       | ISO 2039-2  | JIS K7202             | -                 | 100                  |
| <b>Electrical Properties</b>                    |             |                       |                   |                      |
| Surface Resistivity                             | IEC 60093   | JIS K6911             | Ω                 | > 10 <sup>16</sup>   |
| Volume Resistivity                              | IEC 60093   | JIS K6911             | Ω cm              | > 10 <sup>15</sup>   |
| Insulation Resistance                           | IEC 60167   | JIS K6911             | Ω                 | > 10 <sup>15</sup>   |
| Dielectric Strength                             | IEC 60243-1 | JIS K6911             | KV/mm             | 20                   |
| Dielectric Constant (1 MHz)                     | IEC 60250   | JIS K6911             | -                 | 3.1                  |
| <b>Other Properties</b>                         |             |                       |                   |                      |
| Specific Gravity                                | ISO 1183    | JIS K7112 (A method)  | -                 | 1.2                  |
| Mold Shrinkage                                  | ISO 294-4   | ASTM D-955            | %                 | 0.2-0.6              |
| Water Absorption                                | ISO 62      | JIS K7209             | %                 | 0.3                  |
| Flammability                                    | UL 94       |                       | -                 | HB                   |

The above data are typical laboratory values and are intended to serve as guides only.