

**Mitsubishi Chemical Advanced Materials Proteus® O & P Grade, Natural Homopolymer Polypropylene (ASTM Product Data Sheet)**
**Categories:** Polymer; Thermoplastic; Polypropylene (PP); Polypropylene, Molded

**Material Notes:** Quadrant Engineering Plastic Products is now Mitsubishi Chemical Advanced Materials.

| Physical Properties | Metric     | English    | Comments  |
|---------------------|------------|------------|-----------|
| Specific Gravity    | 0.910 g/cc | 0.910 g/cc | ASTM D792 |

| Mechanical Properties            | Metric     | English       | Comments                |
|----------------------------------|------------|---------------|-------------------------|
| Hardness, Shore D                | 78         | 78            | ASTM D2240              |
| Tensile Strength                 | 33.1 MPa   | 4800 psi      | ASTM D638               |
| Tensile Strength at 65°C (150°F) | 2.76 MPa   | 400 psi       | ASTM D638               |
| Elongation at Break              | 400 %      | 400 %         | ASTM D638               |
| Elongation at Yield              | 14 %       | 14 %          | ASTM D638               |
| Tensile Modulus                  | 1.31 GPa   | 190 ksi       | ASTM D638               |
| Flexural Strength                | 33.1 MPa   | 4800 psi      | ASTM D790               |
| Flexural Modulus                 | 1.34 GPa   | 195 ksi       | ASTM D790               |
| Compressive Strength             | 34.5 MPa   | 5000 psi      | 10% Def.; ASTM D695     |
| Compressive Modulus              | 1.38 GPa   | 200 ksi       | ASTM D695               |
| Izod Impact, Notched             | 0.641 J/cm | 1.20 ft-lb/in | ASTM D256 Type A        |
| Coefficient of Friction, Dynamic | 0.25       | 0.25          | Dry vs. Steel; QTM55007 |

| Electrical Properties          | Metric             | English            | Comments  |
|--------------------------------|--------------------|--------------------|-----------|
| Volume Resistivity             | >= 1.00e+15 ohm-cm | >= 1.00e+15 ohm-cm | ASTM D257 |
| Surface Resistivity per Square | >= 1.00e+15 ohm    | >= 1.00e+15 ohm    | ASTM D257 |

| Thermal Properties                          | Metric                   | English                   | Comments                      |
|---------------------------------------------|--------------------------|---------------------------|-------------------------------|
| Melting Point                               | 164 °C                   | 327 °F                    | Crystalline, Peak; ASTM D3418 |
| Maximum Service Temperature, Air            | 82.2 °C                  | 180 °F                    | Long Term                     |
| Deflection Temperature at 1.8 MPa (264 psi) | 98.9 °C                  | 210 °F                    | ASTM D648                     |
| Flammability, UL94                          | HB<br>@Thickness 3.17 mm | HB<br>@Thickness 0.125 in | Estimated Rating              |

| Compliance Properties | Metric | English | Comments |
|-----------------------|--------|---------|----------|
| 3A-Dairy              | No     | No      |          |
| Canada AG             | No     | No      |          |
| FDA                   | Yes    | Yes     |          |
| NSF                   | No     | No      |          |
| USDA                  | No     | No      |          |
| USP Class VI          | No     | No      |          |

| Chemical Resistance Properties  | Metric       | English      | Comments |
|---------------------------------|--------------|--------------|----------|
| Acids, Strong (pH 1-3)          | Acceptable   | Acceptable   |          |
| Acids, Weak                     | Acceptable   | Acceptable   |          |
| Alcohols                        | Acceptable   | Acceptable   |          |
| Alkalies, Strong (pH 11-14)     | Acceptable   | Acceptable   |          |
| Alkalies, Weak                  | Acceptable   | Acceptable   |          |
| Chlorinated Solvents            | Unacceptable | Unacceptable |          |
| Conductive / Static Dissipative | No           | No           |          |
| Continuous Sunlight             | Limited      | Limited      |          |
| Hot Water / Steam               | Limited      | Limited      |          |
| Hydrocarbons - Aliphatic        | Unacceptable | Unacceptable |          |
| Hydrocarbons - Aromatic         | Unacceptable | Unacceptable |          |
| Inorganic Salt Solutions        | Acceptable   | Acceptable   |          |
| Ketones, Esters                 | Unacceptable | Unacceptable |          |

| Descriptive Properties |  |   |                           |
|------------------------|--|---|---------------------------|
| Machinability          |  | 3 | 1-10, 1=Easier to Machine |