

Bioplastics Compound

Film and Flexible Packaging

Bioplastic Compound Resin : Film

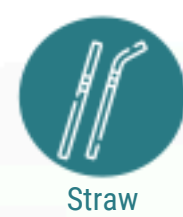


| Bioplastics Compound Resin | | | |
|---------------------------------|-------------|---------|--------------------|
| Properties | Test Method | Unit | PlastMate PB05001F |
| Melt Flow Rate (2.16 kg/190 °C) | ASTM D1238 | g/10min | 5.0 |
| Density | ISO 1183 | g/cm3 | 1.26 |
| Tensile Strength (MD) | ASTM D882 | MPa | 25 |
| Tensile Strength (TD) | ASTM D882 | MPa | 20 |
| Elongation at Break (MD) | ASTM D882 | % | 170 |
| Elongation at Break (TD) | ASTM D882 | % | 350 |
| Dart Impact | ASTM D1709 | g | 450 |

*Remark: Film sample thickness 35 micron, BUR = 2.5 (For machine testing), MD = Machine direction and TD = Transverse direction
 Recommendation: Die Temperature: 170 - 190 °C Extruder Temperature: 180 - 200 °C

Bioplastics

Rigid Packaging



| Bioplastics | | | | |
|--|-------------|---------|-----------------------------------|--|
| Properties | Test Method | Unit | PL34002J for general injection | PL03404J for crystallized PLA high heat injection |
| Physical Properties | | | | |
| Melt Flow Rate (190°C, 2.16 Kg) | ASTM D1238 | g/10min | 30 | 3.4 |
| Melt Flow Rate (210°C, 2.16 Kg) | ASTM D1238 | g/10min | 70 | - |
| Density | ASTM D792 | g/cm3 | 1.26 | 1.31 |
| Mechanical Properties (Injection specimens) | | | | |
| Tensile Strength | ASTM D638 | MPa | 40 | 60 |
| Notched Izod Impact Strength | ASTM D256 | J/m | 70 | 40 |
| Flexural Modulus | ASTM D790 | MPa | 1,960 | 5,500 |
| Flexural Strength | ASTM D790 | MPa | - | 100 |
| Thermal Properties (Injection specimens) | | | | |
| Heat Deflection Temperature | ASTM D648 | °C | 55 | 130 |
| Vicat Softening Point | ASTM D1525 | °C | 110 | 160 |

PL03404J Recommendation: Nozzle temperature: 200 - 210 °C

Extruder temperature: 215 - 200 °C

| Bioplastics | | | |
|---|-------------|----------|---|
| Properties | Test Method | Unit | PL04005E / PL04006E for biostraw longer shelf life |
| Physical Properties | | | |
| Melt Flow Rate (190°C, 2.16 Kg) | ASTM D1238 | g/10 min | 3.5 |
| Density | ASTM D792 | g/cm3 | 1.31 |
| Mechanical Properties (Film Specimens) | | | |
| Tensile Strength | ASTM D882 | MPa | 40 (MD) |
| | | MPa | 35 (MD) |
| Tensile Modulus | ASTM D882 | MPa | 1,400 (MD) |
| | | MPa | 1,500 (TD) |
| Elongation at Break | ASTM D882 | % | 240 (MD) |
| | | % | 140 (TD) |

PL04005E for biostraw longer shelf life 6 months.
 PL04006E for biostraw longer shelf life 12 months.