

TYPICAL PROPERTIES OF POLYSTYRENE (PS)

| ASTM or UL Test | Property | POLYMERS | | COPOLYMERS | | |
|--------------------|--|------------------------------------|--------------------|------------------|--------------------|----------------------|
| | | General Purpose | Impact Modified | Crystal Clear | Impact Modified | Glass Reinforced* |
| PHYSICAL | | | | | | |
| D792 | Specific gravity | 1.04-10.9 | 1.03-1.10 | 1.08-1.10 | 1.05-10.8 | 1.13-1.22 |
| D792 | Specific volume (in ³ /lb) | 26.0-25.6 | 28.1-25.2 | — | — | — |
| D570 | Water absorption, 24 h, 1/8-in thk (%) | 0.03-0.10 | 0.05-0.60 | 0.1 | 0.1 | 0.08 |
| MECHANICAL | | | | | | |
| D638 | Tensile strength (psi) | 5,000-12,000 | 1,500-7,000 | 7,000-7,600 | 4,800-7,200 | 10,500-12,500 |
| D638 | Elongation (%) | 0.5-2.0 | 2-60 | 1.4-1.7 | 2.0-20.0 | 1.3-2.0 |
| D638 | Tensile modulus (10 ⁵ psi) | 4.0-6.0 | 1.4-5.0 | 4.4-4.7 | 2.8-4.2 | 6.3-10.0 |
| D790 | Flexural strength (psi) | 8,000-17,000 | 3,000-12,000 | 12,000-12,600 | 8,500-12,200 | 12,200-19,700 |
| D790 | Flexural modulus (10 ⁵ psi) | 4.0-4.7 | 1.5-4.6 | 4.6-4.9 | 3.2-4.5 | 5.5-9.8 |
| D256 | Impact strength, Izod (ft-lb/in of notch) | 0.2-0.45 | 0.5-4.0 | 0.3-0.5 | 0.5-4.4 | 1.8-2.6 |
| D785 | Hardness, Rockwell M | 65-80 | 10-90 | 108 | 80 | 101 |
| THERMAL | | | | | | |
| C177 | Thermal conductivity (Btu-in/hr-ft ² -°F) | 2.4-3.3 | 1.0-3.0 | 2.4-3.3 | 1.0-3.0 | — |
| D696 | Coefficient of thermal expansion (10 ⁻⁵ in/in-°F) | 3.3-4.4 | 1.9 | 3.5-3.7 | 3.5-3.7 | 2.0-2.2 |
| D648 | Deflection temperature (°F) | | | | | |
| | At 264 psi | 190-220 | 160-200 | 235-249 | 235-249 | 235-260 |
| | At 66 psi | 180-230 | 180-220 | — | — | — |
| UL 94 | Flammability rating† | HB | HB | HB | HB | HB |
| ELECTRICAL | | | | | | |
| D149 | Dielectric strength (V/mil) | | | | | |
| | Short time, 1/8-in thk | 500-700 | 300-600 | 500-700 | 300-600 | — |
| D150 | Dielectric constant | | | | | |
| | At 1 kHz | 2.40-2.65 | 2.4-4.5 | — | — | — |
| D150 | Dissipation factor | | | | | |
| | At 1 kHz | 0.0001-0.0003 | 0.0004-0.0020 | — | — | — |
| D257 | Volume resistivity (ohm-cm) | | | | | |
| | At 73°F, 50% RH | 10 ¹⁷ -10 ¹⁹ | 10 ¹⁶ | — | — | — |
| D495 | Arc resistance (s) | 60-135 | 20-100 | 95 | 95 | — |
| OPTICAL | | | | | | |
| D542 | Refractive index | 1.60 | — | 1.59 | — | — |
| D1003 | Transmittance (%) | 87-92 | 35-57 | 92 | — | — |

*10-20% †V-2, V-1 and V-0 grades are also available.

TYPICAL PROPERTIES OF POLYSTYRENE (PS)

| ISO or UL Test | Property | POLYMERS | | COPOLYMERS | | |
|-------------------|---|------------------------------------|--------------------|------------------|--------------------|----------------------|
| | | General Purpose | Impact Modified | Crystal Clear | Impact Modified | Glass Reinforced* |
| PHYSICAL | | | | | | |
| ISO1183 | Specific gravity | 1.04-1.09 | 1.03-1.10 | 1.08-1.10 | 1.05-1.08 | 1.13-1.22 |
| ISO1183 | Specific volume (cm ³ /g) | 0.936-0.922 | 1.011-0.907 | — | — | — |
| ISO62 | Water absorption , 24 h, 3.1 mm thk (%) | 0.03-0.10 | 0.05-0.60 | 0.1 | 0.1 | 0.08 |
| MECHANICAL | | | | | | |
| ISO527 | Tensile strength (MPa) | 34.47-82.74 | 10.34-48.26 | 48.26-52.40 | 33.09-49.64 | 72.39-86.18 |
| ISO527 | Elongation (%) | 0.5-2.0 | 2-60 | 1.4-1.7 | 2.0-20.0 | 1.3-2.0 |
| ISO527 | Tensile modulus (10 ³ MPa) | 2.76-4.14 | 0.97-3.54 | 3.09-3.24 | 1.93-2.9 | 4.35-6.9 |
| ISO178 | Flexural strength (MPa) | 55.16-117.21 | 20.7-82.74 | 82.74-86.87 | 58.61-84.12 | 84.12-135.83 |
| ISO178 | Flexural modulus (10 ³ MPa) | 2.75-3.24 | 1.03-3.17 | 3.17-3.38 | 2.21-3.10 | 3.79-6.76 |
| ISO180 | Notched Izod impact strength (J/m) | 11-24 | 27-214 | 16-27 | 27-235 | 96-139 |
| ISO2039 | Hardness , Rockwell M | 65-80 | 10-90 | 108 | 80 | 101 |
| THERMAL | | | | | | |
| ISO8302 | Thermal conductivity (W/(mK)) | 0.18 | 0.18 | 0.18 | 0.18 | — |
| ISO11359 | Coefficient of thermal expansion (10 ⁻⁴ m/m-°C) | 0.59-0.79 | 0.34 | 0.63-0.66 | 0.63-0.66 | 0.36-0.39 |
| ISO75 | Deflection temperature (°C) | | | | | |
| | At 1.80 MPa | 88-104 | 71-93 | 113-121 | 113-121 | 113-127 |
| | At 0.45 MPa | 82-110 | 82-104 | — | — | — |
| UL 94 | Flammability rating † | HB | HB | HB | HB | HB |
| ELECTRICAL | | | | | | |
| IEC243 | Dielectric strength (kV/mm) | | | | | |
| | Short time, 3.1 mm thk | 19.7-27.6 | 11.8-23.6 | 19.7-27.6 | 11.8-23.6 | — |
| IEC250 | Dielectric constant | | | | | |
| | At 1 kHz | 2.40-2.65 | 2.4-4.5 | — | — | — |
| IEC250 | Dissipation factor | | | | | |
| | At 1 kHz | 0.0001-0.0003 | 0.0004-0.0020 | — | — | — |
| IEC93 | Volume resistivity (ohm-cm) | | | | | |
| | At 23°C, 50% RH | 10 ¹⁷ -10 ¹⁹ | 10 ¹⁶ | — | — | — |
| ASTM D495 | Arc resistance (s) | 60-135 | 20-100 | 95 | 95 | — |
| OPTICAL | | | | | | |
| ISO489 | Refractive index | 1.60 | — | 1.59 | — | — |
| ASTM D1003 | Transmittance (%) | 87-92 | 35-57 | 92 | — | — |
| *10-20% | †V-2, V-1 and V-0 grades are also available. | | | | | |