# Polycarbonate Plastic

## Material Specicfication Datasheet

Panlite® L-1250ZW - Teijin Chemicals - Polycarbonate

| General Information | | | |
|---|---|---|---|
| Material Status | Commercial : Active | | |
| Availability | : Asia Pacific | : Europe | : North America |
| Features | : Good UV Resistance | : Medium Viscosity | |
| Uses | : Film | : Sheet | |
| | : General Purpose | : Transparent or Translucent Parts | |
| Appearance | : Clear / Transparent | | |
| Forms | : Pellets | | |
| Processing Method | : Extrusion | : Injection Molding | |
| | : Film Extrusion | : Sheet Extrusion | |

| ASTM & ISO Properties 1 | | | |
|---|---|---|---|
| PHYSICAL | Nominal Value | Unit | Test Method |
| Specific Gravity | 1.20 | | ASTM D792 |
| Density | 1.20 | $g/cm^3$ | ISO 1183 |
| Melt Volume-Flow Rate (MVR) (300°C/12kg) | 0.427 | $in^3/10min$ | ISO 1133 |
| Molding Shrinkage - Flow | 0.0050 to 0.0070 | in/in | ASTM D955 |
| Molding Shrinkage - Across Flow | 0.0050 to 0.0070 | in/in | ASTM D955 |
| Molding Shrinkage | | | ISO 294-4 |
| Across Flow | 0.50 to 0.70 | % | |
| Flow | 0.50 to 0.70 | % | |
| Water Absorption (73°F, 24hr) | 0.20 | % | ASTM D570 |
| Water Absorption (73°F, 24hr) | 0.20 | % | ISO 62 |
| MECHANICAL | Nominal Value | Unit | Test Method |
| Tensile Modulus | 348000 | psi | ISO 527-2/1 |
| Tensile Strength (Yield) | 8990 | psi | ASTM D638 |
| Tensile Stress (Yield) | 8990 | psi | ISO 527-2/50 |
| Tensile Strenght (Break) | 11600 | psi | ASTM D638 |
| Tensile Elongation (Yield) | 6 | % | ASTM D638 |
| Tensile Strain (Yield) | 6 | % | ISO 527-2/50 |
| Tensile Elongation (Break) | 140 | % | ASTM D638 |
| Nominal Tensile Strain at Break | 50 | % | ISO 527-2/50 |
| Flexural Modulus | 328000 | psi | ASTM D790 |
| Flexural Modulus[2] | 341000 | psi | ISO 178 |
| Flexural Strength[2] | 13500 | psi | ISO 178 |
| Flexural Strength (Yield) | 13100 | psi | ASTM D790 |
| IMPACT | Nominal Value | Unit | Test Method |
| Charpy Notched Impact Strength | 36 | $ft\text{-}lb/in^2$ | ISO 179 |
| Charpy Unnotched Impact Strength | No Break | | ISO 179 |
| Notched Izod Impact (0.126in) | 17 | $ft\text{-}lb/in^2$ | ASTM D256 |
| HARDNESS | Nominal Value | Unit | Test Method |
| Rockwell Hardness (M-Scale) | 77 | | ASTM D785 |
| THERMAL | Nominal Value | Unit | Test Method |
| Heat Deflection Temperature (66 psi, Unannealed) | 288 | °F | ISO 75-2/B |
| Deflection Temperature Under Load (264 psi, Unannealed) | 268 | °F | ASTM D648 |
| Heat Deflection Temperature (264 psi, Unannealed) | 264 | °F | ISO 75-2/A |
| Vicat Softening Temperature | 300 | °F | ISO 306/B50 |
| CLTE - Flow | 0.000039 | | ASTM D696 |

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|---|---|---|---|
| CLTE - Flow | 0.000039 | | ISO 11359-2 |
| CLTE - Transverse | 0.000039 | | ASTM D696 |
| CLTE - Transverse | 0.000039 | | ISO 11359-2 |
| ELECTRICAL | Nominal Value | Unit | Test Method |
| Surface Resistivity | 1.0E+15 | ohms | IEC 60093 |
| Volume Resistivity | 3.0E+18 | ohms | ASTM D257 |
| Volume Resistivity | 1.00E+15 | ohm·cm | IEC 60093 |
| Dielectric Strenght [3] (0.0630) | 760 | V/mil | ASTM D149 |
| Dielectric Constant | | | ASTM D150 |
| 60 Hz | 2.95 | | |
| 1 MHz | 2.9 | | |
| Relative Permittivity | | | IEC 60250 |
| 100 Hz | 3.10 | | |
| 1 MHz | 3.00 | | |
| Dissipation Factor | | | ASTM D150 |
| 60Hz | 0.00040 | | |
| 1 MHz | 0.0090 | | |
| Dissipation Factor | | | IEC 60250 |
| 100 Hz | 0.0010 | | |
| 1 MHz | 0.0090 | | |
| Arc Resistance | 110 | sec | ASTM D495 |
| Comparative Tracking Index | 250 | V | IEC 60112 |
| Electric Strength | 760 | V/mil | IEC 60243-1 |
| FLAMMABILITY | Nominal Value | Unit | Test Method |
| Flame Rating - UL | | | UL 94 |
| 0.0591 in | HB | | |
| 0.0157 in | V-2 | | |
| UL 746 | Nominal Value | Unit | Test Method |
| RTI Str (0.0579 in) | 257 | °F | UL 746 |
| RTI Imp (0.0579 in) | 239 | °F | UL 746 |
| RTI Elec (0.0579 in) | 257 | °F | UL 746 |
| Comparative Tracking Index (CTI) | 300 | V | UL 746 |
| OPTICAL | Nominal Value | Unit | Test Method |
| Refractive Index | 1.585 | | ASTM D542 |
| Transmittance (118 mil) | 88.0 | % | ASTM D1003 |
| ADDITIONAL INFORMATION | | | |
| Electrical Strength, IEC 60243-1, Short Time Test: 30 MV/m | | | |
| NOTES | | | |

[1] Typical Properties: these are not to be construed as specifications.

[2] 0.079in/min

[3] Method C (Slow rate of Rise)



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### Chemical Resistance

The chemical resistance of a polymer describes its ability to maintain mechanical integrity while being exposed to specific chemical environments. Temperature, chemical concentration, state of mechanical stress, and duration of exposure are key variables that influence the ultimate performance of Polycarbonate Plastic in a particular environment.

Given these many critical variables, the final classification of "suitable for use" is largely dependent upon the application. The information contained in the following chart can be used only as a guide in assessing the general suitability of polycarbonate for their particular application. The prospective user must determine, by suitable testing, the correct application of our product in their particular application.

R = Resistant (compatible) L = Limited resistance (short time compatibility) N = Not resistant (not compatible) nd = No Data

| | | | | | |
|---|---|---|---|---|---|
| Acetic Acid | R | Cyclohexanone | N | Nickel Sulfate | R |
| Acetic Acid 20% | R | Detergents | R | Nitrating Acid (<15% HN03) | nd |
| Acetic Acid 80% | R | Diacetone Alcohol | N | Nitrating Acid (<15% H2S04) | nd |
| Acetic Acid, Glacial | R | Dichlorobenzene | N | Nitric Acid (20%) | R |
| Acetic Anhydribe | N | Dichloroethane | N | Nitric Acid (50%) | R |
| Acetone | N | Diesel Fuel | R | Nitric Acid (5-10%) | R |
| Acetyl Chloride (dry) | N | Diethyl Ether | N | Nitric Acid (Concentrated) | L |
| Acetylene | N | Diethylamine | N | Nitrobenzene | N |
| Acrylonitrile | N | Diethylene Glyco | R | Nitromethane | N |
| Alcohols:Amyl | R | Dimethyl Aniline | N | Oils:Diesel Fuel (20,30,40,50) | nd |
| Alcohols:Butyl | R | Dimethyl Formamide | N | Oils:Fuel (1,2,3,5A,5B,6) | R |
| Alcohols:Ethyl | R | Epsom Salts (Magnesium Sulfate) | R | Oils:Hydraulic Oil (Petro) | nd |
| Alcohols:Isobutyl | nd | Ethane | nd | Oils:Hydraulic Oil (Synthetic) | nd |
| Alcohols:Isopropyl | R | Ethanol | R | Oils:Mineral | R |
| Alcohols:Methyl | R | Ethyl Acetate | N | Oils:Olive | R |
| Aluminum Chloride | R | Ethyl Benzoate | N | Oils:Orange | L |
| Aluminum Chloride 20% | R | Ethyl Chloride | N | Oils:Pine | R |
| Aluminum Hydroxide | R | Ethylene Bromide | N | Ozone | R |
| Aluminum Nitrate | R | Ethylene Chloride | N | Pentane | R |
| Aluminum Potassium Sulfate 10% | R | Ethylene Chlorohydrin | N | Perchloroethylene | N |
| Aluminum Postasium Sulfate 100% | R | Ethylene Diamine | R | Phenol (10%) | R |
| Aluminum Sulfate | R | Ethylene Dichloride | N | Phenol (Carbolic Acid) | N |
| Amines | N | Ethylene Glycol | R | Phosphoric Acid (>40%) | R |
| Ammonia 10% | N | Ethylene Oxide | L | Phosphoric Acid (crude) | R |
| Ammonia Nitrate | R | Fatty Acids | R | Phosphoric Acid (molten) | nd |
| Ammonia, anhydrous | N | Ferric Chloride | R | Phosphoric Acid (_40%) | R |
| Ammonia, liquid | N | Ferric Nitrate | R | Phosphoric Acid Anhydride | N |
| Ammonium Carbonate | nd | Ferric sulfate | R | Phosphorus Trichloride | L |
| Ammonium Chloride | R | Ferrous Chloride | N | Photographic Developer | R |
| Ammonium Hydroxide | N | Ferrous Sulfate | R | Photographic Solutions | R |
| Ammonium Nitrate | nd | Fluorine | L | Phthalic Anhydride | R |
| Ammonium Oxalate | R | Fluosilicic Acid | R | Potassium Bromide | R |
| Ammonium Persulfate | R | Formaldehyde 100% | R | Potassium Chlorate | R |
| Ammonium Phosphate,Dibasic | R | Formaldehyde 40% | R | Potassium Chloride | R |
| Ammonium Sulfate | R | Formic Acid | R | Potassium Dichromate | R |
| Ammonium Sulfite | nd | Fuel Oils | R | Potassium Hydroxide | N |
| Amyl Acetate | N | Gasoline (high-aromatic) | R | Potassium Nitrate | R |
| Amyl Alcohol | R | Gasoline,leaded,ref. | R | Potassium Oxalate | nd |
| Aniline | N | Gasoline,unleaded | R | Potassium Permanganate | R |
| Aniline Hydrochloride | N | Glucose | R | Potassium Sulfate | R |
| Antimony Trichloride | R | Glycerin | R | Potassium Sulfide | nd |
| Aqua Regia (80% HCl, 20% HN03) | N | Heptane | R | Propane (liquefied) | L |
| Arsenic Acid | R | Hexane | R | Propylene | nd |
| Barium Carbonate | R | Hydraulic Oil (Petro) | nd | Propylene Glycol | R |
| Barium Chloride | R | Hydraulic Oil (Synthetic) | nd | Pyridine | N |
| Barium Hydroxide | N | Hydrazine | N | Resorcinal | R |
| Barium Nitrate | N | Hydrochloric Acid 100% | N | Salicylic Acid | R |

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| | | | | | |
|---|---|---|---|---|---|
| Barium Sulfate | N | Hydrochloric Acid 20% | R | Salt Brine (NaCl saturated) | R |
| Beer | R | Hydrochloric Acid 37% | N | Sea Water | R |
| Benzaldehyde | N | Hydrocyanic Acid (Gas 10%) | R | Silicone | R |
| Benzene | N | Hydrofluoric Acid 100% | N | Silver Bromide | nd |
| Benzene Sulfonic Acid | N | Hydrofluoric Acid 20% | N | Silver Nitrate | R |
| Benzoic Acid | R | Hydrofluoric Acid 50% | N | Soap Solutions | R |
| Benzol | N | Hydrofluoric Acid 75% | N | Soda Ash (see Sodium Carbonate) | R |
| Benzonitrile | R | Hydrogen Gas | R | Sodium Acetate | R |
| Boric Acid | R | Hydrogen Peroxide 10% | R | Sodium Benzoate | R |
| Bromine | L | Hydrogen Peroxide 100% | R | Sodium Bicarbonate | R |
| Butadiene | N | Hydrogen Peroxide 30% | R | Sodium Bisulfate | R |
| Butane | N | Hydrogen Peroxide 50% | R | Sodium Bisulfite | R |
| Butanol (Butyl Alcohol) | R | Hydrogen Sulfide (aqua) | R | SodiumBorate (Borax) | R |
| Butyl Amine | N | Hydrogen Sulfide (dry) | nd | Sodium Bromide | nd |
| Butyl Phthalate | N | Isooctane | R | Sodium Carbonate | R |
| Butylacetate | N | Isopropyl Acetate | N | Sodium Chlorate | R |
| Butylene | N | Isopropyl Ether | N | Sodium Chloride | R |
| Butyric Acid | N | Jet Fuel (JP3,JP4,JP5) | R | Sodium Chromate | R |
| Calcium Bisulfate | N | Kerosene | N | Sodium Hydroxide (20%) | R |
| Calcium Bisulfite | N | Ketones | N | Sodium Hydroxide (50%) | N |
| Calcium Carbonate | L | Lacquer Thinners | R | Sodium Hydroxide (80%) | N |
| Calcium Chlorate | nd | Lacquers | N | Sodium Hypochlorite(5%) | R |
| Calcium Chloride | R | Lactic Acid | R | Sodium Hypochlorite(<20%) | L |
| Calcium Hydroxide | N | Lead Sulfamate | R | Sodium Hypochlorite(100%) | nd |
| Calcium Hypochlorite | N | Lithium Chloride | R | Sodium Peroxide | R |
| Calcium Nitrate | R | Lithium Hydroxide | N | Sodium Sulfate | R |
| Calcium Sulfate | R | Lubricants | N | Sodium Sulfide | N |
| Carbolic Acid (Phenol) | N | Lye:Ca(OH)2 Calcium Hydroxide | N | Sodium Sulfite | nd |
| Carbon Disulfide | N | Lye:KOH Potassium Hydroxide | N | Sodium Thiosulfate (hypo) | N |
| Carbon Monoxide | R | Lye:NaOH Sodium Hydroxide | N | Stannic Chloride | R |
| Carbon Tetrachloride | N | Magnesium Bisulfate | R | Sulfur Dioxide | L |
| Carbonic Acid | R | Magnesium Carbonate | R | Sulfur Dioxide (dry) | R |
| Chloric Acid | nd | Magnesium Chloride | R | Sulfuric Acid (<10%) | R |
| Chlorine (dry) | L | Magnesium Hydroxide | R | Sulfuric Acid (10-75%) | R |
| Chlorine Water | nd | Magnesium Nitrate | R | Sulfuric Acid (75-100%) | N |
| Chlorine,Anhydrous Liquid | L | Magnesium Sulfate (Epsom Salts) | R | Sulfuric Acid (cold concentrated) | nd |
| Chloroacetic Acid | N | Manganese Sulfate | R | Sulfuric Acid (hot concentrated) | N |
| Chlorobenzene (Mono) | N | Mercuric Chloride (dilute) | R | Soda Ash (see Sodium Carbonate) | R |
| Chloroform | N | Mercurous Nitrate | R | Toluene (Toluol) | N |
| Chlorosulfonic Acid | L | Mercury | N | Trichloroacetic Acid | N |
| Chocolate Syrup | R | Methane | R | Trichloroethane | N |
| Chromic Acid 10% | R | Methanol (Methyl Alcohol) | R | Trisodium Phosphate | nd |
| Chromic Acid 30% | L | Methyl Alcohol 10% | R | Turpentine | N |
| Chromic Acid 5% | R | Methyl Butyl Ketone | N | Urea | N |
| Chromic Acid 50% | N | Methyl Cellosolve | N | Vinegar | R |
| Citric Acid | N | Methyl Chloride | N | Water,Acid,Mine | R |
| Clorox® (Bleach) | R | Methyl Ethyl Ketone | N | Water,Deionized | nd |
| Copper Cyanide | N | Methyl Isobutyl Ketone | N | Water,Distilled | R |
| Copper Nitrate | N | Methyl Isopropyl Ketone | N | Water,Fresh | R |
| Copper Sulfate >5% | R | Methyl Methacrylate | N | Water,Salt | R |
| Copper Sulfate 5% | R | Mineral Spirits | L | Whiskey & Wines | R |
| Cresols | N | Motor oil | R | Xylene | N |
| Cresylic Acid | N | Naphtha | R | Zinc Chloride | R |
| Cupric Acid | R | Nickel Chloride | R | Zinc Sulfate | R |
| Cyclohexane | R | Nickel Nitrate | N | | |



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