# IRIDESCENT ACRYLIC

## Typical Properties

| Property | Test Method | Units | Values |
|---|---|---|---|
| **PHYSICAL** | | | |
| Specific gravity | ASTM D 792 | - | 1.19 |
| Water absorption, 24 hours @ 73°F | ASTM D 570 | % | 0.2 |
| **MECHANICAL** | | | |
| Tensile strength, elongation | ASTM D 638 | psi | 10,000 |
| Rupture modulus of elasticity | ASTM D 638 | psi | 400,000 |
| Flexural strength | ASTM D 790 | psi | 17,000 |
| Modulus of elasticity | ASTM D 790 | psi | 480,000 |
| Compressive strength, yield | ASTM D 695 | psi | 17,000 |
| Izod impact strength, notch | ASTM D 256 | ft/lbs/in. | 0.4 |
| Rockwell hardness | ASTM D 785 | - | M-93 |
| Barcol Hardness | ASTM D 2583 | - | 48 |
| Refractive Index | ASTM D 542 | psi | 1.49 |
| Light transmission, total | ASTM D 1003 | % | 92 |
| **THERMAL** | | | |
| Forming temperature | - | °F | Approx. 300°F |
| Deflection temperature under load, 264 psi | ASTM D 648 | °F | 195°F (91°C) |
| Vicat softening point | ASTM D 1525 | °F | 220°F (105°C) |
| Maximum recommended continuous service temperature | - | °F | 160°F (71°C) |
| Coefficient of linear thermal expansion | ASTM D 696 | in/in/°F | 0.000040 |
| Coefficient of thermal conductivity | Cenco-Fitch | BTU/hr(sq.ft)(°F)(1470J/Kg·K) | 1.3 |
| Flammability, burning rate @ 0.125” | ASTM D 635 | in/min. | 1.0 |
| Self-ignition temperature | ASTM D 1929 | °F | 850°F (455°C) |
| Specific heat @77°F | - | BTU/hr(sq.ft)(°F)(1470J/Kg·K) | 0.35 |
| Smoke density rating | ASTM D 2843 | % | 4.8 |
| **ELECTRICAL** | | | |
| Dielectric strength short time @ 0.125” | ASTM D 149 | volts/mil | 430 |
| Dielectric constant @ 60 Hz | ASTM D 150 | - | 3.6 |
| @ 1,000 Hz | ASTM D 150 | - | 3.3 |
| @ 1,000,000 Hz | ASTM D 150 | - | 2.8 |
| Dissipation factor @ 60 Hz | ASTM D 150 | - | 0.06 |
| @ 1,000 Hz | ASTM D 150 | - | 0.04 |
| @ 1,000,000 Hz | ASTM D 150 | - | 0.02 |
| Volume resistivity | ASTM D 257 | Ohm·cm | $10^{16}$ |
| Surface resistivity | ASTM D 257 | Ohm·cm | $10^{16}$ |

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## Fabrication guidelines

**Cutting:** It can be sawed with circular saws or band saws. It can be drilled, routed, filed, and machined much like wood or brass with a slight modification of tools. Because the sheet softens quickly, it is necessary to keep the cutting tool and machined edge of the sheet as cool as possible. Cooling of the cutting tool is recommended. Tool sharpness and "trueness" are essential to prevent gumming, heat buildup, and stresses in the part. Heat buildup at the machined edge could lead to subsequent stress crazing and therefore must be avoided.

**Laser cutting:** Laser technology is ideal for quick and accurate cutting, welding, drilling, scribing, and engraving of plastics. CO2 lasers focus a large amount of light energy on a very small area which is extremely effective for cutting complex shapes in acrylic sheet. The laser beam produces a narrow kerf in the plastic allowing for close nesting of parts and minimal waste. CO2 lasers vaporize the acrylic as they advance resulting in a clean polished edge but with high stress levels; annealing acrylic sheet after laser cutting is recommended to minimize the chance of crazing during the service life of the part.

**Cementing:** This sheet can be cemented using common solvent cements or polymerizable cements. The most critical factor is good edge preparation of the part to be cemented. The edge of the sheet must be properly machined in order to have a square flat surface and no stresses. Annealing of the part prior to cementing is recommended. Cement and cement fumes should not contact formed or polished surfaces.

**Annealing:** The sheet may be annealed at 180°F (82°C) with the heating and cooling times determined by the sheet thickness. An approximate guideline is annealing time in hours equals the sheet thickness in millimeters and the cool-down period is a minimum of 2 hours ending when sheet temperature falls below 140°F. For example, 1/8" (3mm) sheet would be heated for 3 hours at 180°F (82°C) and slowly cooled for 3 hours.



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