



Description: Acrylics (Polymethyl-Methacrylate or PMMA) is an amorphous thermoplastic which is optically transparent, unaffected by moisture, and offers a high strength-to-weight ratio. Common trade names of acrylic include Plexiglas®, Lucite®, and Acrylite®.

General Properties: Acrylics offer high light transmittance with a refractive index of 1.49 and can be easily heat-formed without loss of optical clarity. Prolonged exposure to moisture, or even total immersion in water, does not significantly effect the mechanical or optical properties of acrylic. Most commercial acrylics have been UV stabilized for good weatherability and resistance prolonged sunlight exposure.

Acrylics are unaffected by aqueous solutions of most laboratory chemicals, by detergents, cleaners, dilute inorganic acids, alkalis, and aliphatic hydrocarbons -- however, acrylics are NOT recommended for use with chlorinated or aromatic hydrocarbons, esters, or ketones.

Physical Properties:

Property	Acrylic	ATSM or UL test
Density (lb/in ³)	0.043 ³	D792
(g/cm ³)	1.18 ³	D570
Water Absorption, 24 hrs (%)	0.3	D570

Mechanical Properties:

Tensile Strength (psi)	8,000-11,000	D638
Tensile Modulus (psi)	350,000-500,000	D638
Tensile Elongation at Break (%)	2	D638
Flexural Strength (psi)	12,000-17,000	D790
Flexural Modulus (psi)	350,000-500,000	D790
Compressive Strength (psi)	11,000-19,000	D695
Compressive Modulus (psi)	—	D695
Hardness, Rockwell	M80-M100	D785
IZOD Notched Impact (ft-lb/in)	0.3	D256

Thermal Properties:

Coefficient of Linear Thermal Expansion (x 10 ⁻⁵ in./in./°F)	5-9	D696
Heat Deflection Temp (°F/°C) at 264 psi	150-210/65-100	D648
Melting Temp (°F/°C)	-/-	D3418
Max Operating Temp (°F/°C)	150-200/65-93	—
Thermal Conductivity (BTU-in/ft ² -hr-°F) (x10 ⁻⁴ cal/cm-sec-°C)	3.9 ³ 1.2 ³	C177
Flammability Rating	—	UL94

Electrical Properties:

Dielectric Strength (V/mil) short time, 1/8" thick	400	D149
Dielectric Constant at 60 Hz	4.0	D150
Dissipation Factor at 60 Hz	0.05	D150

Optical Properties:

Light Transmission, minimum (%)	92	—
Refractive Index	1.48-1.50	

Note: The information contained herein are typical values intended for reference and comparison purposes only. They should NOT be used as a basis for design specifications or quality control.

TAP Plastics Acrylic Spheres have a diameter tolerance of +/- .005 inch and a sphericity of +/- .005 inch.