

# ACRYLITE® Resist

## Physical Properties

Continuously manufactured ACRYLITE® Resist sheet is a versatile, thermoplastic material developed for the retail display and glazing markets as well as other markets requiring strength, appearance and weatherability.

High optical quality ACRYLITE® Resist sheet provides the beautiful look of acrylic with much greater impact strength for durability during manufacturing, shipping, and in-store use. Rigid, tough, and lightweight, ACRYLITE® Resist is easily fabricated and machined, including cutting, routing, forming, and cementing.

ACRYLITE® Resist is ideal for use in:

- P-O-P Displays
- Store Fixtures
- Glazing
- General Fabrication

### Availability

ACRYLITE® Resist sheet is available in colorless in sheet sizes of 48" x 96", 60" x 96" and 72" x 96" and thicknesses ranging from .060" – .236". Custom sizes are available on request. All sheets are protected with a polyethylene film masking.

### Impact Strength

Superior performance ACRYLITE® Resist sheet has many times the impact strength of glass and standard acrylic sheet. (Testing per ASTM D 3029).

### Light Weight

ACRYLITE® Resist sheet weighs half as much as glass.

### Surface Hardness

With a greater surface hardness than polyesters, ACRYLITE® Resist helps to reduce damage during fabrication and extends service life.

### Dimensional Stability

ACRYLITE® Resist sheet will expand or contract when exposed to temperature or humidity change. The material's post-forming stability is excellent; however, shrinkage will occur when an unclamped sheet is subjected to forming temperatures.

### Strength & Stresses

The tensile strength of ACRYLITE® Resist is 8,900 psi at room temperature (ASTM D 638). For applications subject to continuous loadings, the design should allow for a load that will not exceed 600 psi at 73°F (23°C). Continuous loads well below 8,900 psi will lead to stress crazing and eventual failure.

### Heat resistance

ACRYLITE® Resist keeps its rigid shape up to 160°F. When subjected to temperatures below 32°F and higher than 100°F, ACRYLITE® Resist sheet begins to appear hazy. Once the sheet equalizes (between 60–80°F) it returns to its original, high light transmitting clarity.

### Light Transmission

Colorless ACRYLITE® Resist light transmittance is greater than 91% (1/8" thickness). It retains high light transmitting properties for many years.

### Formability

ACRYLITE® Resist sheets' forming temperature range is 270°F – 350°F. ACRYLITE® Resist softens with temperature increases above 220°F, thus passing through the thermo-elastic to the thermoplastic state. This change is gradual, rather than sharply defined. Because this change is gradual, certain procedures should be considered during thermoforming. If the sheet is to be hung in an oven, a continuous clamp rather than several individual clamps must be used, preventing permanent deformation of the sheet between clamps. If the sheet is heated by infrared heaters supported in a horizontal frame, control of the heaters positioned over the center of the sheet will prevent over heating the center of the sheet, which could cause an excessive amount of sagging.

Shrinkage occurs in the machine direction when heating is performed without clamping. The shrinkage range is 3–5%, depending on thickness and forming temperature. Expansion can be expected in the cross machine direction. This will range from 0–2.2%, again depending on thickness and forming temperature.

### Cutting & Machining

ACRYLITE® Resist is cut and shaped using all of the same machining operations used with standard extruded acrylic sheets. (i.e. cutting, routing, drilling, etc.).

### Cementing

Common solvent cements or polymerizable cements work well when joining ACRYLITE® Resist to itself or other acrylic sheet products. Care must be taken to provide a sheet edge that is machined properly and contains low stress. A generous amount of cement should be applied along the entire length of pieces being joined; taking care to ensure the cement fills the entire area between the pieces.

Please refer to the "ACRYLITE® Resist Fabrication Manual" for detailed information.

### Annealing

ACRYLITE® Resist may be annealed at 180°F with the heating and cooling times dependent on sheet thickness. An approximate guideline is: annealing time in hours is equal to the sheet thickness in millimeters (to a minimum of 2 hrs); the cool down period should be a minimum of 2 hours, ending when sheet temperature falls below 140°F.

### Weather Resistance

ACRYLITE® Resist sheet is manufactured from weatherable acrylic polymer. It can be used outdoors for many years with little loss of impact strength or its acrylic-like appearance.

### Flammability

ACRYLITE® Resist is a combustible thermoplastic. Precautions should be taken to protect this material from flames and high heat sources. ACRYLITE® Resist sheet usually burns rapidly to completion if not extinguished. The products of combustion, if sufficient air is present, are carbon dioxide and water. However, in many fires, sufficient air will not be available and toxic carbon monoxide will be formed, as it will when other common combustible materials are burned. We urge good judgement in the use of this versatile material and recommend that building codes be followed carefully to assure it is used properly.

ACRYLITE® Resist is a UL recognized component, UL flammability rating 94HB.

## Chemical Resistance

ACRYLITE® Resist is resistant to many chemicals, some of which include:

- Solutions of inorganic alkalis
- Diluted acids
- Aliphatic hydrocarbons

It is attacked, in varying degrees by, but not limited to:

- Aromatic solvents (i.e. benzene and toluene)
- Alcohols
- Chlorinated hydrocarbons (i.e. methylene chloride)
- Lacquer thinners (esters, ketones and ethers)

ACRYLITE® Resist is resistant to most chemicals in normal use with resistance to fatty and oily products. There is no measurable permeation or adverse effect on the material in contact with oils and aliphatic hydrocarbon-based products.

## Chemical Stability

The data on page 5 was realized at test temperature 68°F (20°C) and 50% relative humidity. Results vary depending on the temperature and moisture content of the material. In practice, resistance is dependent on internal and external stresses as well as the method of fabrication. We recommend appropriate testing.

ACRYLITE® Resist meets FDA requirements for use in many food contact applications.

See chart of ACRYLITE® Resist sheet resistance to certain chemicals below.

- + Resistant
- x Limited Resistance
- Non-resistant

## Chemical Resistance

<b>Drinks and Edible Liquids</b>	+	Pure-oil paints	-	Carbolic Acid	-	Benzene	+	Hexane
+ Beer, wine, fruit juice	x	Wax polish	+	Hydrogen peroxide, up to 40%	-	Butanol	x	Isopropyl alcohol
+ Coffee, tea	<b>Gases</b>		-	Tincture of iodine, 5%	-	Carbon disulfide	-	Lactic acid butyl acetate
x Cooking oil	+	Ammonia	<b>Inorganic Substances</b>		-	Chlorinated hydrocarbons	-	Methyl ethyl ketone
x Liqueurs, see ethyl alcohol	x	Bromine	x	Chromic acid	-	Chlorophenol	x	Methanol, up to 30%
+ Milk, chocolate	+	Carbon dioxide	+	Calcium hypochlorite	-	Cresol	-	Methanol over 30%
+ Vinegar	x	Chlorine	-	Hydrochloric acid	x	Cyclohexane	-	Methyl chloride
+ Water, mineral water	+	Methane	x	Hydrofluoric acid, up to 20%	-	Diacetone alcohol	-	Motor fuel mixture, with benzene
<b>Spices</b>	+	Natural Gas	+	Nitric acid, up to 20%	-	Dibutyl phthalate	x	Motor fuel mixture without benzene
+ Aniseed, bay leaves, nutmeg	+	Nitrogen dioxide	x	Nitric acid 20 to 70%	+	Diethylene Glycol	x	Paraffin
- Cloves	+	Nitrogen monoxide	+	Phosphoric acid, up to 20%	-	Dioxane	x	Perchloroethylene
+ Pepper, cinnamon, onions	-	Sulfur dioxide (dry)	+	Sulfuric Acid, up to 30%	-	Ether	-	Phenols
<b>Greases &amp; Oils without additives</b>	<b>Alkalis</b>		x	Sulfurous Acid, concentrated	-	Ethyl acetate	-	Pyridine
+ Animal	+	Caustic potash	+	Sulfurous Acid, up to 5%	x	Ethyl alcohol, up to 30%	+	Tricresyl phosphate
+ Mineral	+	Soap suds	-	Sulfur dioxide, liquid	-	Ethyl alcohol, over 30%	+	Triethyl amine
+ Vegetable	+	Soda	<b>Organic Solvents &amp; Plasticizers</b>		-	Ethyl bromide	-	Toluene
<b>Paints, Waxes, Etc</b>	+	Whitewash	-	Acetone	-	Ethyl butyrate	-	Xylene
x Acrylic paints	<b>Disinfectants</b>		-	Amyl Acetate	-	Ethylene bromide	<b>General</b>	
- Cellulose paints	+	Bleaching Powder paste	-	Aniline	x	Ethylene glycol	+	Photographic baths
- Paint thinners	+	Bleaching powder solution up to 20%	-	Benzaldehyde	+	Heptane	-	Nail polish

## Physical Properties

	ASTM method	ACRYLITE® RESIST 45 sheet (.118")	ACRYLITE® RESIST 65 sheet (.118")	ACRYLITE® extruded sheet (.118")
<b>Mechanical</b>				
Specific Gravity	D 729	1.18	1.16	1.19
Tensile Strength	D 638	8.6 kpsi (59.2 MPa)	6.7 kpsi (46.2 MPa)	9.7 kpsi (66.8MPa)
Tensile Elongation, Yield	D 638	5.8%	6.6%	3.9%
Tensile Modulus of Elasticity	D 638	400 kpsi (2755 MPa)	320 kpsi (2203 MPa)	490 kpsi (3375 MPa)
Flexural Strength	D 790	14.7 kpsi(101.3 MPa)	12.0 kpsi (82.7MPa)	17.0 kpsi (117.1 MPa)
Flexural Modulus of Elasticity	D 790	370 kpsi (2548 MPa)	300 kpsi (2066 MPa)	480 kpsi (3306 MPa)
Rockwell Hardness	D 785	88 M	70 M	93 M
Impact Strength: Izod Milled Notch	D 256	.66 ft-lb/in (34.6 J/m)	.75 ft-lb/in (39.4 J/m)	.40 ft-lb/in (21.0 J/m)
Charpy (unnotched)	D 5942-97	14.1 ft-lb/in (740 J/m)	16.5 ft-lb/in (866 J/m)	-
Gardner Impact	D 3029	20 in-lb ( 11J)	40 in-lb (21 J)	2 in-lb (1 J)
<b>Optical</b>				
Refractive Index	D 542	1.49	1.49	1.49
Gloss 20°	D 523	125	140	-
Light Transmission	D 1003	91.6%	91%	92%
<b>Thermal</b>				
Forming Temperature	-	-	270-350°F (132-177°C)	300°F (149°C)
Deflection Temperature Under Load, 264 psi	D 648	208°F (98°C)	203°F (95°C)	210°F (99°C)
Vicat Softening Point	D 1525	217°F (103°C)	210°F (99°C)	221°F (105°C)
Maximum Recommended Continuous Service Temp.	-	-	160°F (71°C)	160°F (71°C)
Coefficient of Linear Thermal Expansion	D 696	.00004 in/in/°F (.00007 m/m/°C)	.000044 in/in/ °F (.00008 m/m/°C)	.00004 in/in/ °F (.00007 m/m/°C)
Self-Ignition Temperature	D 1929	-	750°F (399°C)	850° F (454°C)
Smoke Density	D 2843-99	-	2.2% @ .060" (1.5 mm) 3.8% @ .236" (6.0 mm)	4.8% @ .250" (6.4mm)
Average Burn Rate	D 635-98	-	1.4 in/min (36 mm/min) @.060"(1.5 mm) 1.0 in/min (25 mm/min) @ .236"(6.0)	1.0 in/min (25 mm/min) @ .125"(3.2 mm)
<b>Water Absorption</b>				
24 hrs @ 73°C	D 570	.3%	.3%	.2%

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