acrylic sheets

for hot tub applications

2023 GLOBAL
ENGLISH

ACRYSPA™

Photo: USSPA

ACRYSPA™

AcrySpa™ Acrylic Sheet products are continuous cast and derived from unique formulations. AcrySpa™ Acrylic Sheet I-300 is a cross-linked solvent resistant acrylic sheet with exceptional thermoforming characteristics making it ideally suited for applications such as sanitaryware. AcrySpa™ Acrylic Sheet I-300 is available in standard colors and is produced to customers' orders in many thicknesses and sizes.


Photo: USSPA

design freedom

With larger sizes, better uniformity and superior properties, AcrySpa™ Acrylic Sheet opens new horizons for product designs never possible with conventional cell-cast acrylic sheet.

color laboratory

AcrySpa™ Acrylic Sheet gives designers freedom in colors, too. AcrySpa™ Acrylic Sheet is supplied in a variety of standard and marbleized colors and, by request, the AcrySpa™ color laboratory can develop other colors that may be required.

formability

AcrySpa™ Acrylic Sheet can be thermoformed. This involves heating the material to approximately 380° F (195° C) and forming the desired shape with vacuum or air pressure.

fabrication

Unlike glass and other materials, AcrySpa™ Acrylic Sheet can easily be sawed, drilled, routed, filed, cemented, and machined. It behaves similar to hardwood or brass.

customized size in sheet or reel

LENGTH, WIDTH, THICKNESS, COLOR… You Decide. The ultimate in flexibility for our customers.

Photo: USSPA

unlimited length

Because AcrySpa™ Acrylic Sheet is continuously cast, it can be produced in either reels or sheets of lengths limited only by the practicality of shipping and handling weights and sizes. This eliminates unsightly and costly seams and joints in finished products.

AcrySpa™ Acrylic Sheet is available in reels, providing additional savings, a variety of efficient handling and fabricating techniques, and allowing reduced inventories—permitting the use of storage space for production.

closer thickness tolerance

A thickness tolerance of ± 10% or ± .015″ (0.4 mm), whichever is greater, is maintained in AcrySpa™ Acrylic Sheet, assuring uniformity. This uniformity reduces the rate of rejections attributable to breakage, thinning out or variances in light transmission.

availability

AcrySpa™ Acrylic Sheet can be supplied in widths from 24″ to 110″ (60 to 280 cm). Sheet thicknesses range from 0.080″ to 0.500″ (2 to 13 mm). AcrySpa™ Acrylic Sheet can be cut to fractional sizes to comply with close tolerances required by Mill Specs or customer specifications.

properties

resistance to breakage

AcrySpa™ Acrylic Sheet has 10 to 17 times greater breakage (impact) resistance than glass in equivalent thicknesses. Unlike other plastics used in glazing, AcrySpa™ Acrylic Sheet does not lose its outstanding breakage resistance because of degradation from weathering.

light weight

Aristech Surfaces Acrylic Sheet is about 46% as heavy as ordinary glass.

safety

The resistance to breakage and lighter weight of AcrySpa™ Acrylic Sheet make it a safer material to handle and work with. If breakage should occur, the material does not shatter and splinter. Usually the break is local (a hole) or a clean single break. The broken edges are dull compared to glass fragments. Several state and local building code agencies specify acrylics over ordinary glass for storm door and other glazing applications where safety is the main criterion.

weather resistance

AcrySpa™ Acrylic Sheet has outstanding weathering resistance. Even in areas such as Florida and Arizona, acrylics are virtually unaffected after 15 or more years exposure. Acrylics have been used successfully in aircraft glazing since before World War II and for more than 40 years in outdoor sign applications.

optical clarity

Light transmittance for clear AcrySpa™ Acrylic Sheet is about 93% compared to 88% for ordinary glass.

resistance to temperature extremes

The continuous use temperature for AcrySpa™ Acrylic Sheet is up to 180° F (82° C). Higher temperatures can be tolerated for short periods of time without permanent damage occurring. At extremely low temperatures (-30° F) (-34.4° C), AcrySpa™ Acrylic Sheet remains very serviceable with only a slight reduction in breakage resistance occurring.

insulating values

AcrySpa™ Acrylic Sheet is a better insulator than glass. Its heat transfer characteristics are similar to those of rubber. The coefficient of thermal conductivity (K Factor) or ability to conduct heat is 1.4 compared to 5 to 6 for ordinary glass. This means with zero wind velocity on both sides of the windowpane, ordinary glass conducts heat more than 4 times as fast as AcrySpa™ Acrylic Sheet. The overall coefficient of heat transmission (U Factor) is 1.04 compared to 1.25 for glass. At these conditions, AcrySpa™ Acrylic Sheet is still approximately 20% better insulator than ordinary glass.

Photo: USSPA

standard colors


Silver White 6427


Odyssey 6301


Mediterranean 6240


Espresso 6281


Mayan Copper 6256


Oceanwave Opal 6811


Midnight Opal 6878


Oyster Opal 6970


High Gloss White 6167


Gypsum II 9514


White Pearl 6696


Desert 9581


Sahara 9583

standards

AcrySpa™ Acrylic Sheet will meet and/or exceed the following specifications:

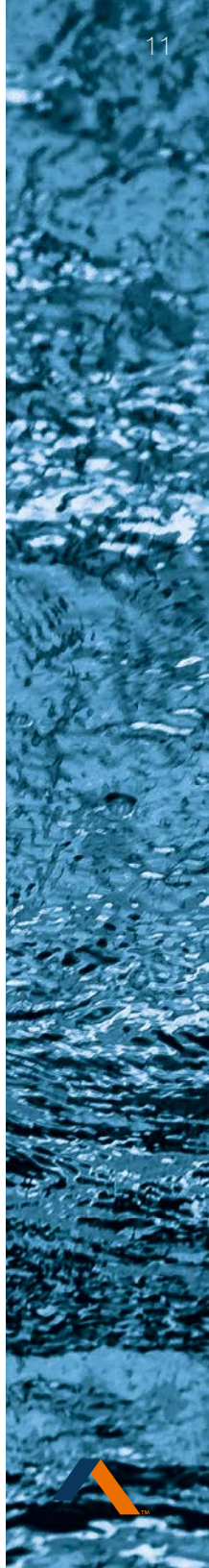
- **ASTM D 4802-02 Category A-2, Finish 1 and 2, Type UVF.**
  Exception: thickness tolerance shall be as listed on front page of this bulletin.
- **American National Standards Institute Specifications**
  ANSI-Z-124.1—
  Plastic bathtub units.
  ANSI-Z-124.2—
  Plastic shower units.
  ANSI-Z-124.3—
  Plastic lavatories.
- **International Association of Plumbing & Mechanical Officials** (IAPMO)
- **Material and Property Standards**
  for Acrylic-Faced Bathtubs, Tub-showers and Lavatories.
- **Material and Property Standard**
  for Acrylic-Faced Spas.

Note: for cautions and information on exposure to any Aristech Surfaces' product, please see the applicable material safety data sheet.

Photo: USSPA

technical properties AcrySpa™

property	typical values	units	test method
general			
Thickness	0.125 (3.17)	Inch (mm)	-
Specific gravity	1.19	-	ASTM D-792
mechanical			
Tensile Strength	10,000 (68.9)	psi (MPa)	ASTM D-638
Tensile Modulus	450,000 (3,171)	psi (MPa)	ASTM D-638
Tensile Elongation	4.0	%	ASTM D-638
Flexural Strength	15,500 (106)	psi (MPa)	ASTM D-790
Flexural Modulus	410,000 (3,102)	psi (MPa)	ASTM D-790
Notched Izod Impact	0.4 (2.1)	ft.-lb./in. of notch (kJ/m^2)	ASTM D-256 (Method A)
Charpy Impact (Un-notched)	4.6 (24.2)	ft.-lb./in. (kJ/m^2)	ASTM D-6110
Falling Dart Impact	3.0 (4.1)	ft.-lbs. (J)	FTMS 406-M-1074
Rockwell Hardness (M)	90-100	-	ASTM D-785
Barcol Hardness	48-52	-	ASTM D-2583
thermal			
Hot Forming Temperature	340-380 (171-193)	°F (°C)	Aristech Method
DTUL @ 264 psi (1.82 MPa)	190 (88)	°F (°C)	ASTM D-648
Thermal Conductivity	1.4 (20.2)	Btu/(h·ft²·°F/in.) (W/(m²·K/cm))	Cinco-Fitch
Specific Heat	0.35 (1465)	Btu/(lb.·°F) (J/(kg·K))	ASTM C-351
Coefficient of Linear Thermal Expansion	0.000041 (0.000074)	in./in./°F (cm/cm/°C)	ASTM D-696
Thermal Stability 30 min. @ 356 °F (180 °C)	No degradation	-	ASTM D-4802
Flammability	94 HB	-	UL Test # 94
miscellaneous			
Water Absorption	0.33	%	ASTM D-570



AcrySpa™ Plus

AcrySpa™ Plus is a revolutionary composite engineered material that has a continuous cast acrylic surface combined with a high-impact substrate material for added strength. The acrylic surface is AcrySpa™ I-300 continuous cast opaque sheet with its proven weathering characteristic and general aesthetics. The substrate is a high impact grade ABS that imparts outstanding impact resistance and thermoformability to the total composite.

Photo: USSPA

Many thermoforming applications like spas, recreational vehicles, pool steps and marine components demand outstanding weathering characteristics, toughness, and impact resistance. Aristech Surfaces AcrySpa™ Plus is truly without peer as a weatherable, thermoformable thermoplastic composite sheet. Additionally, AcrySpa™ Plus offers customers environmental and production advantages over alternative materials and methods of production.

Photo: USSPA

AcrySpa™ Plus is offered in a variety of opaque marbleized patterns and solid colors. It is available in various sizes and calipers depending on the application.


Photo: USSPA

weather resistance

The AcrySpa™ Plus acrylic surface is virtually unaffected by weathering even after many years exposure in areas such as Florida and Arizona. AcrySpa™ Plus has the same continuous cast acrylic surface as other well-known Aristech Surfaces products that have performed exceptionally well in outdoor applications for twenty or more years.

impact resistance

AcrySpa™ Plus has impact resistance far greater than regular acrylic. The cast acrylic/ ABS composite actually takes on the impact properties of the high impact grade ABS substrate which has been engineered for this purpose. Unlike other thermoplastics and composites, this outstanding impact resistance is retained as the sheet weathers.

thermoformability

AcrySpa™ Plus can be thermoformed on either dual or single side thermoforming equipment with heating cycles ranging from 10 to 25 minutes. In all forming situations, the acrylic side should be heated to 350 - 380°F (177 - 193°C) while the ABS side is to be maintained at 300 - 340°F (149 - 171°C).

Photo: USSPA

fabrication

AcrySpa™ Plus can be cut, drilled and machined similar to Aristech Surfaces other cast acrylic sheet products. In addition, shearing and punching techniques under controlled conditions may be used since AcrySpa™ Plus has many of the attributes of its high impact ABS substrate fabrication.

reinforcement or support

Through the implementation of the Clean Air Act of 1990, the government is putting pressure on industry to reduce styrene emissions from polyester/ fiberglass spray-up operations. AcrySpa™ Plus helps customers reduce emissions by potentially eliminating the need for fiberglass reinforcement. Depending on the shape and depth of draw, AcrySpa™ Plus may or may not require any post-support or reinforcement.

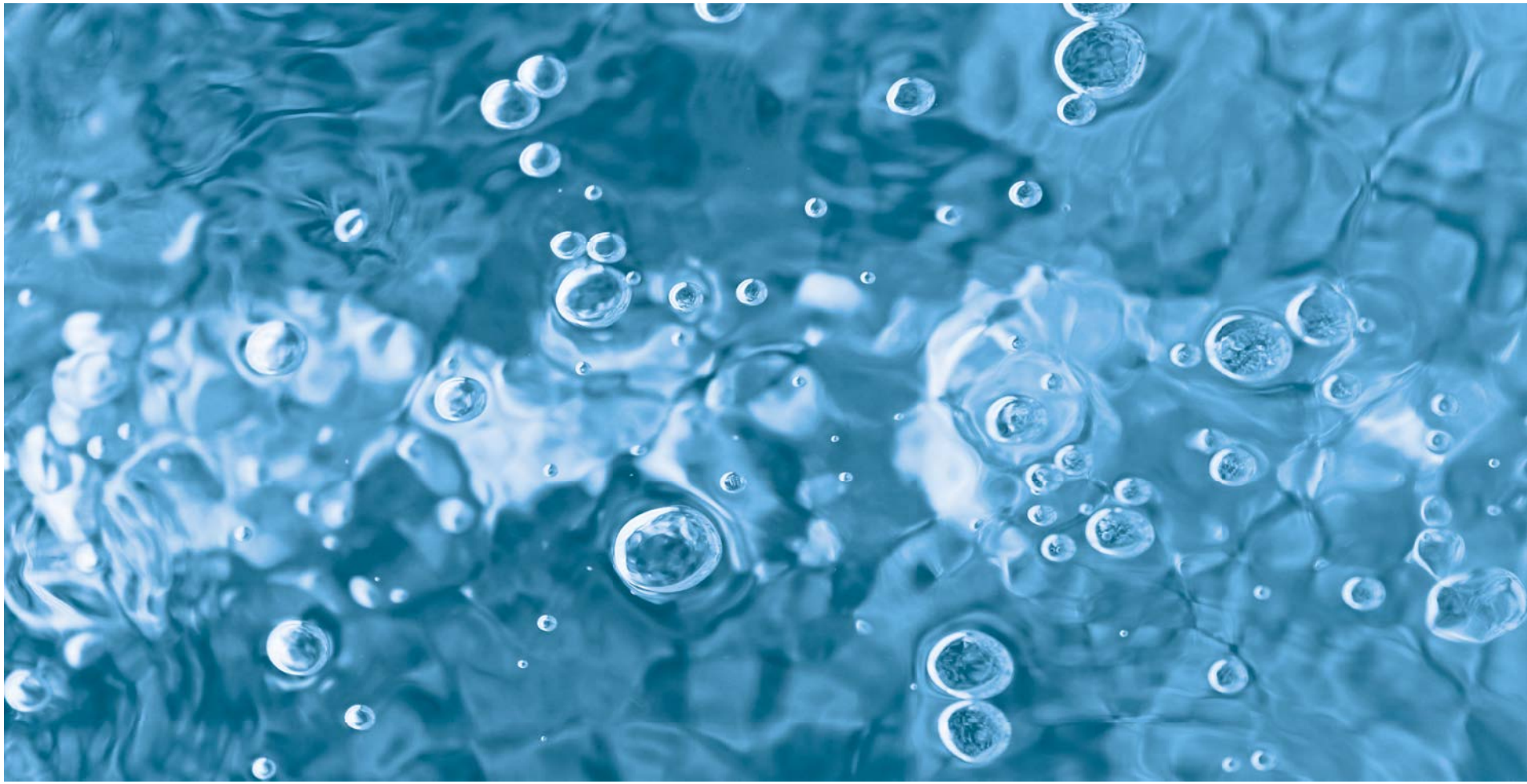
In summary, AcrySpa™ Plus offers the best of both cast acrylic and ABS, giving it performance properties unequaled by any other known thermoplastic.

technical properties AcrySpa™ Plus

property	0.160 in. thickness typical values	0.275 in. thickness typical values	0.350 in. thickness typical values	units	test method
general					
Thickness	0.160 (4.1)	0.275 (6.99)	0.350 (8.88)	Inch (mm)	–
Specific gravity	1.085	1.10	1.10	–	ASTM D-792
mechanical					
Tensile strength	6,600 (45.5)	6,500 (44.8)	6,100 (42.1)	psi (MPa)	ASTM D-638
Tensile modulus	370,000 (2,551)	380,000 (2,620)	350,000 (2,413)	psi (MPa)	ASTM D-638
Tensile elongation	4.4	5.0	6.2	%	ASTM D-638
Flexural strength (acrylic in compression)	9,100 (62.7)	10,000 (68.9)	8,900 (61.4)	psi (MPa)	ASTM D-790
Flexural modulus (acrylic in compression)	340,000 (2,344)	310,000 (2,137)	335,000 (2,310)	psi (MPa)	ASTM D-790
Flexural strength (acrylic in tension)	10,800 (74.5)	10,800 (74.5)	10,700 (73.8)	psi (MPa)	ASTM D-790
Flexural modulus (acrylic in tension)	326,000 (2,247)	314,000 (2,165)	323,000 (2.227)	psi (MPa)	ASTM D-790
Notched Izod impact	2.1 (11.0)	2.4 (12.6)	3.2 (16.8)	ft-lb/in. of notch (kJ/m^2)	ASTM D-256 (Method A)
Falling dart impact	12.3 (16.7)	> 30 (40.7)*	54 (73.2)*	ft.-lbs. (J)	FTMS 406-M-107 4
Rockwell hardness (m)	67	97	48-52	–	ASTM D-785
Barcol hardness	54	52	90-100	–	ASTM D-2583
thermal					
Hot Forming Temperature (acrylic side)	350-380 (177-193)	350-380 (177-193)	350-380 (177-193)	°F (°C)	Aristech Method
Hot Forming Temperature (ABS side)	300-340 (149-171)	300-340 (149-171)	300-340 (149-171)	°F (°C)	Aristech Method
DTUL @ 264 psi (1.82 MPa)	186.0 (85.6)	193.0 (89.4)	193 (89.4)	°F (°C)	ASTM D-648
Coefficient of thermal expansion	0.000047 (0.000085)	0.000044 (0.000079)	0.000043 (0.000077)	in./in./°F (cm/cm/°C)	ASTM D-696
Flammability	–	94HB	94HB	–	UL Test #94
miscellaneous					
Water absorption	0.19	0.19	0.20	%	ASTM D-570
Gardner Gloss (60 Angle)	87.4	–	–	–	ASTM D-523
Odor	None	None	None	–	–
Taste	None	None	None	–	–
50 Cycles Freeze-Thaw -20°F (-29°C) to 180°F (82.2°C)	–	No effect	No effect	–	Aristech Method

* Actual value higher — This is the limit of the test apparatus.

Photo: Bullfrog



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