Typical Physical Properties

Typical physical properties of cast acrylic

Values quoted are results of tests on representative samples and do not constitute a specification.

	Item	Test method and conditions	Unit	Test result
General	Specific gravity	ASTM D-792 : 2000	-	1.19
	Relative density	ISO 1183	-	1.19
	Water absorption rate (24 hrs)	ASTM D-570	%	0.2
	Vicat softening point (Full)	ASTM D-1525 : 2006	°C	Min110
Mechanical	Tensile strength	ASTM D-638 : 2003	MPa	71
	Elongation at break		%	4
	Flexural strength	ASTM D-790 : 2003	MPa	98
	Flexural modulus			2800
	Izod impact strength (notched)	ASTM D-256 : 2000	J/m	20
	Rockwell hardness	ASTM D-785 : 2003	M scale	104
Optical	Total light transmittance	ASTM D-1003	%	93
	Haze			0.5
	Refractive index (ηD^{20})	ASTM D-542 : 2006	-	1.49
Thermal	Heat deflection	ASTM D-648 : 2006	°C	105
	Flammability	ASTM D-635 : 2003	mm/min	30
	Linear expansion coefficient	ASTM E-831 : 2006	mm/mm/°C	5.5×10^{-5}

Compatibility and chemical resistance of A-Cast® cast acrylic

A-Cast® chemical resistance tests are based on a temperature of 23°C with stress-free material.

Chemical Resistance

Paint		Arsenic acid	R	Ethyl alcohol, to 15%	R
Acrylic paints and lacquers	LR	Battery acid	R	Ethyl alcohol, 15-30%	LR
Aromatic-free hydrocarbons	R	Benzaldehyde	NR	Ethyl alcohol, absolute	NR
Nitrocellulose	NR	Benzene	NR	Ethyl bromide	NR
Oil paints, pure	R	Bromine	NR	Ethyl butyrate	NR
Thinners, general	NR	Butanol	LR	Ethylene bromide	NR
Chemical process baths		Butyl lactate	NR	Ferric chloride	R
Electroplating baths	R	Butyric acid, to 5%	R	Ferrous chloride	R
Photographic baths	R	Calcium chloride	R	Ferrous sulphate	R
Building materials		Calcium hypochlorite	R	Formic acid, to 2%	R
Bituminous emulsion	NR	Carbon disulfide	NR	Formic acid, to 40%	LR
Cement	R	Carbon tetrachloride	NR	Glycerol	R
Hot bitumen	LR	Chlorinated hydrocarbons	NR	Glycol	R
Mortar	R	Chlorine, liquid	NR	Heptane	R
Plaster of paris	R	Chlorine, water	LR	Hexane	R
Red lead	R	Chloroethyl acetate	NR	Hydrochloric acid	R
Chemicals and solvents		Chlorophenol	NR	Hydrofluoric acid, to 20%	R
Acetic acid, glacial	NR	Chromic acid	LR	Hydrogen peroxide, to 40%	R
Acetic acid, to 25%	LR	Citric acid, to 20%	R	Hydrogen peroxide, over 40%	LR
Acetic acid, 5% (vinegar)	R	Copper sulphate	R	Iodine	R
Alum	R	Cresol	NR	Isopropyl alcohol, to 50%	LR
Aluminium chloride	R	Cyclohexane	R	Lactic acid, to 80%	LR
Aluminium oxalate	R	Diacetone alcohol	NR	Magnesium chloride	R
Aluminium sulphate	R	Diamyl phthalate	LR	Magnesium sulphate	R
Ammonia, aqueous solution	R	Dibutyl phthalate	NR	Manganese sulphate	R
Ammonium sulphate	R	Diethylene glycol	R	Mercury	R
Amyl acetate	NR	Dioxane	NR	Methanol, absolute	NR
Aniline	NR	Ether	NR	Methanol, to 15%	LR
Arsenic	R	Ethyl acetate	NR	Methyl ethyl ketone	NR
Methylated spirits	NR	Tartaric acid, to 50%	R	Ice cream	R

Legend: R Resistant LR Limited Resistance NR Not Resistant

Chemical Resistance

Milk of lime	R	Thionyl chloride	NR	Marinades	R
Monobromonaphthalene	R	Toluene	NR	Meat and fish	R
Motor fuel, benzene-free	R	Triethylamine	R	Salt, pepper, cinnamon, onions	R
Motor fuel, with benzene	NR	Trichloroacetic acid	NR	Vinegar	R
Nickel sulphate	R	Tricresyl phosphate	R	Beer, wine, spirits to 30%	R
Nitric acid, to 20%	R	Turpentine	LR	Coffee, tea, chocolate	R
Nitric acid, 20-70%	LR	Turpentine substitute	LR	Fruit juices, milk	R
Nitric acid, over 70%	NR	Urea, to 20%	R	Water, mineral water, soda	R
Oxalic acid	R	Xylene	NR	**Gases and vapours**	
Paraffin	LR	Zinc sulphate, aqueous	LR	Ammonia	R
Perchloroethylene	NR	Zinc sulphate, solid	R	Bromine vapour, dry	LR
Petroleum ether	R	**Disinfectant**		Carbon dioxide	R
Phenols	NR	Aqueous hypochlorite solution	R	Carbon monoxide	R
Phosphoric acid, to 10%	R	Bleaching powder, to 5%	R	Chloride vapour, dry	LR
Phosphorus trichloride	NR	Carbolic acid	NR	Exhaust gases, incl HCl	R
Phosphorus	NR	Hydrogen peroxide, to 40%	R	Exhaust gases, incl HF	R
Picric acid, 1% in water	R	Hydrogen peroxide, over 40%	LR	Exhaust gases, incl sulphuric acid	R
Potassium dichromate	R	Lugol solution	R	Hydrogen sulphide	R
Potassium carbonate	R	Mercuric chloride	R	Methane	R
Potassium chloride	R	Surgical spirit	NR	Nitric oxide	R
Potassium cyanide	R	Tincture of iodine, 5%	NR	Oxygen	R
Potassium hydroxide	R	**Greases, oils and waxes**		Ozone	R
Potassium nitrate	R	Animal	R	Sulphur dioxide, dry	R
Potassium permanganate	R	Mineral	R	Natural Gas, Butane	R
Silicon tetrachloride	NR	Silicone oil	LR	**Cleaning agents**	
Silver nitrate	R	Vegetable	LR	Also refer chemicals & solvents	
Sodium bisulphite	R	**Plastics**		Alcohol,to 30%	R
Sodium carbonate	R	Foams	R	Alcohol, absolute	NR
Sodium chlorate	R	Foams, containing plasticizer	NR	Petrol, pure	R
Sodium chloride	R	Polyamide	R	Petrol mixture, with benzene	NR
Sodium hydroxide	R	Polyethylene	R	Soap solution	R
Sodium hypochlorite	R	PVC	R	Soda solution	R
Sodium sulphate	R	PVC, plasticized	NR	Solvent stain removers	NR
Sodium sulphide	R	Rubber	R	Trichloroethylene	NR
Stearic acid	R	Rubber, containing plasticizer	NR	**Pest control agents**	
Sulphur	R	**Foodstuffs and beverages**		Aqueous solutions of pesticides	LR
Sulphur dioxide, liquid	NR	Aniseed, bay, nutmeg	R	**Other**	
Sulphuric acid, to 30%	R	Cloves	NR	Nail polish, nail polish remover	NR
Sulphurous acid, conc.	LR	Coffee beans, unflavoured	R	Sea water	R
Sulphurous acid, to 5%	R	Coffee beans, flavoured	LR	Soaps	R
Sulphuryl chloride	R	Honey, pure	R	Sprays	LR