

Elvacite® 2021C

Acrylic Resin

Elvacite® 2021C is a high molecular weight methyl methacrylate polymer. It is used in barrier coatings for vinyl. Its high molecular weight provides excellent abrasion resistance. Elvacite® 2021C is non-reactive and provides excellent viscosity control in reactive systems.

Performance Features and Key Benefits

- Vinyl Topcoats to provide excellent abrasion resistance.
- Lacquer coatings
- Viscosity control in reactive systems

Typical Properties^a

Appearance	Solid bead
Specific Gravity, 25° C	1.20
Glass Transition Temp, onset (calculated)	97°C
Molecular Weight (Mw)	105,000
Acid Number (mg KOH/g Resin)	0.8
Tensile Strength, psi	15,000
Elongation at break (23° C, 50% RH)	4%

a) Typical physical properties listed are approximate values and should not be considered manufacturer's release specifications. Manufacturer's release specifications are subject to change without notice, please contact your Elvacite® representative for the latest product specification details.

Preparing Solutions

Elvacite® resins dissolve at room temperature but require constant agitation to prevent solvent-swollen granules of polymer from forming agglomerates and sticking to the walls of the vessel.

Important: The polymer beads should be sifted directly into the vortex of the stirred solvent to speed wetting-out and dispersion. Continuous low-shear agitation for periods of 1-12 hours, depending on the grade and concentration of resin, is recommended.

After the solution appears clear in the tank, a sample should be spread out on a Leneta card or glass. After the solvent evaporates and a film forms on the card or glass, there should not be any resin seeds. If there are any seeds, the tank should be agitated further to fully dissolve the resin. Tank agitation should not be stopped (except for sampling) until the film test indicates there are no resin seeds. Any cloudiness or residue may indicate that some polymer remains undissolved. The presence of water in the system can also cause cloudiness.

Solution time can be reduced by heating; most common solvents can be heated to approximately 49°C (120°F) without the need for reflux equipment. High-shear agitation also cuts dissolving time, but requires care to avoid overheating and excessive solvent loss.

Pasadena, Texas, USA

Grade: ELVACITE® 2021C

Issue date: November 2019

COMPLIANCE WITH FDA REGULATIONS revised April 1, 2019

We, MITSUBISHI CHEMICAL AMERICA, INC., Specialty Resins Division, confirm that Elvacite® 2021C complies with the compositional requirements of the following United States of America's Food and Drug Administration (FDA) regulation.

Elvacite® 2021C is cleared for use under FDA 21 CFR 177.1010 as semirigid and rigid acrylic plastics articles intended for use in contact with food.

Compliance with the limitation on extractives can only be demonstrated by tests carried out on the final article.

These products are limited to use only as plastic article Houseware products under the FDA Houseware exemption.

This statement of compliance is correct at the date of issue.

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As food contact regulations and product formulations are subject to change, it is the user's responsibility to ensure that they are in possession of a current statement of compliance.

Solvent Solubility at 20% solids

Alcohols		Ethyl acetate	C	Ketones	
Methyl Alcohol	I	Isopropyl acetate	C	Acetone	C
Ethyl Alcohol	I	n-butyl acetate	H	Methyl Ethyl Ketone	C
n-propyl Alcohol	I	n-amyl acetate	H	Methyl Isobutyl Ketone	I
Isopropyl Alcohol	I	Butyl lactate	C	Diisobutyl Ketone	I
Isoamyl Alcohol	I	Propylene glycol monoethyl ether acetate	C	Cyclohexanone	I
Cyclohexanol	I	Methyl amyl acetate	I	Isophorone	I
Ethylene glycol	I			Diacetone Alcohol	H
Glycerol	I	Ethers		Methyl amyl ketone	I
		Diethyl Ether	I		
Amides		Diisopropyl ether	I	Nitrile	
Formamide	I	Tetrahydrofuran (THF)	C	Acetonitrile	C
Dimethyl formamide (DMF)	C	"Cellosolve" Solvent	C		
				Nitroparaffins	
Chlorohydrocarbons		Hydrocarbons		Nitromethane	C
Methylene Chloride	C	Toluene	C	Nitroethane	C
Ethylene dichloride	C	Xylene	I		
Perchloroethylene	I	n-Hexane	I	Vegetable Oils	
1, 1, 1- Trichloroethane	I	Cyclohexane	I	Castor oils	I
		VM & P Naphtha	I	Linseed oils	I
Esters		Turpentine	I		
Methyl formate	C				
(C = Clear Solution, H = Hazy Solution, I = Insoluble)					

Viscosity

Elvacite® 2021C is a high molecular weight methyl methacrylate polymer. The following table illustrates typical viscosities of Elvacite® 2021C by varying both solvent and resin concentration.

Solubility of Elvacite® 2021C in Solution			
Solvent	Approximate Solution Viscosity (cP)		
	20% Solids by wt	30% Solids by wt	40% Solids by wt
Toluene	90	450	25,000+
Methyl Ethyl Ketone	90	800	25,000+
Isopropyl Acetate	500	15,000	25,000+
"Cellosolve" Solvent	2,000	22,000	25,000+

Typical Formulation

The following formulation is given as starting points only. The final formulation will be determined by the coating properties desired.

Typical Vinyl Topcoating Lacquer

Ingredient	% by Wt.
Elvacite® 2021C	2.96
Methyl Ethyl Ketone	12.99
"Bakelite" QYNV vinyl chloride dispersion resin	6.99
Tetrahydrofuran (THF)	<u>63.06</u>
	100.00
Non-volatiles (solids), % by weight	10.0
Non-volatiles (solids), % by volume	6.7

Preparation – Dissolve Elvacite® 2021C in MEK, dissolve vinyl resin in THF, and combine.

Resin Compatibility

Elvacite® 2021C is compatible with the following Elvacite® Resin Grades: 2009, 2010, 2021, and 2013. It is also compatible with the other types of resins, as illustrated in the following table:

Blending Resin	Description	Form of Blended Resin Tested	Supplier	Elvacite / Blending Resin (by solids weight)		
				75/25	50/50	25/75
Alkyd						
Aroplaz 1271	Long linseed drying oil	30% in MEK	Spencer Kellogg	---	I	I
Aroplaz 1351	Long castor nondrying oil	30% in MEK	Spencer Kellogg	---	C	H
Chempol 13-1410	Safflower drying oil, acrylate mod.	50% in Xylene	Freeman Chemical	---	I	I
Paraplex RG-2	Nondrying oil, sebacic	30% in MEK	Rohm & Haas Co.	I	I	I
Plaskon 3105	Short coconut nondrying oil	60% in Xylene	Cargill, Inc.	---	H	H
Cellulosic						
Cellulose acetate 39-5-5B		30% in Acetone or MEK	Hercules Inc.	I	I	I
Cellulose Acetate Butyrate, ½ - sec.		30% in MEK	Eastman	I	I	I
Ethyl Cellulose N-7		30% in MEK	Hercules Inc.	I	I	I
Nitrocellulose "RS", ½-sec Isopropyl		MEK/alcohol soln.	Hercules Inc.	C	C	C
Epoxy						
Epon 828		100% Resin	Shell Chemical Co.	C	---	C
Epon 1001		30% in MEK	Shell Chemical Co.	C	C	C
Elastomers						
EMD-504	Polyisobutylene	30% in Toluene	Exxon Chemical Co.	I	I	I
Hypalon 30	Chlorosulfonated polyethylene	15% in Toluene	Dupont Polymers	I	I	I
Neoprene AC-Soft	Polychloroprene	15% in Toluene	Dupont Polymers	I	I	I
Rosin Derivatives						
Ester Gum 8L		30% in MEK	Hercules Inc.	H	I	I
Pentalyn 255	Pentaerythritol ester	30% in MEK	Hercules Inc.	---	H	H
Pentalyn 830	Pentaerythritol ester	30% in MEK	Hercules Inc.	---	H	H
Vinyl Chloride Resins						
Bakelite VAGH	Copolymer	30% in MEK	Union Carbide Corp.	C	C	C
Bakelite VMCH	Copolymer	30% in MEK	Union Carbide Corp.	C	C	C
Bakelite VYHH	Copolymer	30% in MEK	Union Carbide Corp.	C	C	C
Bakelite VYNS	Copolymer	15% in MEK	Union Carbide Corp.	C	C	C
Exon 450	Copolymer	15% in MEK	Firestone Plastics Co.	C	C	C
Exon 9290	Homopolymer	15% in THF	Firestone Plastics Co.	C	C	C
Geon 103 EP	Homopolymer	15% in THF	B.F. Goodrich Chemical	C	C	C
Other Types						
Arochem 650	Maleic-modified hard resin	30% in MEK	Spencer Kellogg	---	C	C
Aroset 4110	Acrylic resin	30% in MEK	Spencer Kellogg	---	H	H
Dammar		30% in Toluene		H	I	H
DC-840	Silicone resin	60% in Toluene	Dow Corning Corp.	C	C	C
Parlon S 10	Chlorinated rubber	30% in MEK	Hercules Inc.	I	I	I

(C = Clear solution, H = Hazy solution, I = Insoluble)

For further information or samples, please contact your local distributor, or:

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