

# ELVACITE®

ACRYLIC RESINS

## Elvacite® 2042

### Acrylic Resin

Elvacite® 2042 is a very high molecular weight ethyl methacrylate polymer. It is a tough, alcohol – tolerant, broadly compatible grade for use in abrasion – resistant coatings such as high gloss clear lacquers for decals and outdoor signs. It is slightly softer than Elvacite® 2013.

Typical Properties <sup>a</sup> of Elvacite® 2042	
Appearance	Solid bead
Specific Gravity, 25° C	1.11
Glass Transition Temp, onset	76°C
Molecular Weight (Mw)	268,000
Particle Size (D50)	110-180 microns
Acid Number	0
Tukon Hardness, Knoop No.	11
Tensile Strength, psi	5,400
Elongation at break (23°C, 50% RH)	25%
<small>a) Typical physical properties listed are approximate values and should not be considered manufacturers release specifications. Manufacturers release specifications are subject to change without notice, please contact your Dianal America Representative for the latest product specification details.</small>	

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### 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.

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### Solvent Solubility

Table I depicts the solubility of Elvacite® 2042 at 20% solids in various solvents.

**Table I: Solubility of Elvacite® 2042 (S = Soluble, C = Cloudy solution, I = Insoluble)**

<b>Alcohols</b>		Isopropyl acetate	S	<b>Ketones</b>	
Methyl Alcohol	I	n-Butyl acetate	S	Acetone	S
Ethyl Alcohol	I	n-Amyl acetate	S	Methyl Ethyl Ketone	S
n-propyl alcohol	I	Butyl lactate	S	Methyl Isobutyl Ketone	S
Isopropyl alcohol	I	Propylene glycol monoethyl ether acetate	S	Diisobutyl ketone	S
Isoamyl alcohol	I	Methyl amyl acetate	S	Cyclohexanone	S
Cyclohexanol	I			Isophorone	S
Ethylene glycol	I			Diacetone Alcohol	S
Glycerol	I			Methyl amyl ketone	S
		<b>Ethers</b>			
<b>Amides</b>		Diethyl Ether	S	<b>Nitrile</b>	
Formamide	I	Diisopropyl ether	I	Acetonitrile	S
Dimethyl formamide (DMF)	S	Tetrahydrofuran (THF)	S		
		"Cellosolve" Solvent	S	<b>Nitroparaffins</b>	
<b>Chlorohydrocarbons</b>		<b>Hydrocarbons</b>		Nitromethane	S
Methylene Chloride	S	Toluene	S	Nitroethane	S
Ethylene dichloride	S	Xylene	S		
Perchloroethylene	S	n-Hexane	I	<b>Vegetable Oils</b>	
1,1,1-Trichloroethane	S	Cyclohexane	I	Castor oil	I
		VM & P Naphtha	I	Linseed oil (alkali-refined)	I
<b>Esters</b>		Mineral Spirits	I		
Methyl Formate	S	Turpentine	I		
Ethyl acetate	S				

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## Viscosity and Gloss

Elvacite® 2042 is a very high molecular weight ethyl methacrylate polymer. Table II illustrates typical viscosities of Elvacite® 2042 by varying both solvent and resin concentration.

Solvent	Concentration (% Solids)		
	20%	30%	40%
Toluene	120	1200	12000
Methyl Ethyl Ketone	80	2000	>25000
Isopropyl Acetate	80	18000	>25000
Cellosolve Solvent	6500	>25000	--

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### Resin Compatibility

Elvacite® 2042 is compatible with the following Elvacite® Resin Grades: 2013, 2014, 2016, 2028 and 2043. 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
<b>Alkyd</b>						
Aroplaz 1271	Long linseed drying oil	30% in MEK	Reichold Chemical Inc.	X	I	I
Aroplaz 1351	Long castor nondrying oil	30% in MEK	Reichold Chemical Inc.	C	C	C
Chempol 13-1410	Safflower drying oil, acrylate mod	50% in Xylene	Cook Composites & Polymers	--	C	H
Paraplex RG-2	Nondrying oil, sebacic	30% in MEK	C.P. Hall Inc.	I	I	I
Blagden 3105	Short coconut nondrying oil	60% in Xylene	Blagden Chemical Ltd	--	H	H
<b>Cellulosic</b>						
Cellulose acetate 39-5-5B		30% in Acetone or MEK	Hercules Inc.	I	I	I
Cellulose Acetate Butyrate, ½ - sec.		30% in MEK	Eastman Chemical	C	C	C
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
<b>Epoxy</b>						
Epon 828		100% Resin	Resolution Performance Prod	C	--	C
Epon 1001		30% in MEK	Resolution Performance Prod	C	I	I
<b>Elastomers</b>						
EMD-504	Polyisobutylene	30% in Toluene	Exxon Chemical	I	I	I
Hypalon 30	Chlorosulfonated Polyethylene	15% in Toluene	Dupont Polymers	I	I	---
Neoprene AC-Soft	Polychloroprene	15% in Toluene	Dupont Polymers	I	I	---
<b>Rosin Derivatives</b>						
Ester Gum 8L		30% in MEK	Hercules Inc.	C	H	H
Pentalyn 255	Pentaerythritol ester	30% in MEK	Hercules Inc.	H	I	H
Pentalyn 830	Pentaerythritol ester	30% in MEK	Hercules Inc.	H	H	H
<b>Vinyl Chloride Resins</b>						
UCAR® Sol'n Vinyl VAGH	Copolymer	30% in MEK	Union Carbide	C	C	C
UCAR® Sol'n Vinyl VMCH	Copolymer	30% in MEK	Union Carbide	C	C	C
UCAR® Sol'n Vinyl VYHH	Copolymer	30% in MEK	Union Carbide	C	C	C
UCAR® Sol'n Vinyl VYNS	Copolymer	15% in MEK	Union Carbide	C	C	C
Exon 450	Copolymer	15% in MEK	Freestone Plastics	C	C	--

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Exon 9290	Homopolymer	15% in THF	Freestone Plastics	C	C	C
Geon 103 EP	Homopolymer	15% in THF	B.F. Goodrich	C	C	C
<b>Other Types</b>						
Arochem 650	Maleic-modified hard resin	30% in MEK	Reichold Chemical Inc.	C	C	C
Aroset 4110	Acrylic resin	30% in MEK	Reichold Chemical Inc.	C	C	C
Dammar		30% in Toluene		I	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.	C	C	C
Piccoumaron	Coumarone-indene resin	30% in MEK	Hercules Inc.	C	C	C
Santolite MHP	Sulfonamide-formaldehyde	30% in MEK	Monsanto Co.	C	C	C
Shellac		30% in Methanol		H	I	I
Super-Bechacite 2000	Permanently fusible phenolic	30% in MEK	Reichold Chemicals	C	C	C
Uformite MX-61	Triazine-formaldehyde resin	30% in MEK	Rohm & Haas Co.	C	C	I
<b>(C = Clear solution, H = Hazy solution, I = Insoluble)</b>						

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### COMPLIANCE WITH FDA REGULATIONS

Elvacite® 2042 complies with the compositional requirements of the following United States of America's Food and Drug Administration (FDA) regulations.

1. FDA 21 CFR 175.105 for adhesives used as components of articles intended for use in the packaging, transporting, or holding food.

2. FDA 21 CFR 175.300 in resinous and polymeric coatings used as the food contact surface of articles intended for use in producing, packing, processing, preparing, treating, packaging, transporting, or holding food. The coating in its finished form in which it is to contact food is subject to a restriction on its chloroform soluble extractives.

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

3. FDA 21 CFR 175.320 in resinous and polymeric coatings for polyolefin films, provided it is intended for repeated food contact use as specified in FDA 21 CFR 175.300(a). The coating in its finished form in which it is to contact food is subject to a restriction on its chloroform soluble extractives.

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

4. FDA CFR 176.170 as a component of the uncoated or coated food contact surface of paper and paperboard intended for use in producing, manufacturing, packing, processing, preparing, treating, packaging, transporting or holding aqueous and fatty foods.

5. FDA 21 CFR 176.180 as a component of the uncoated or coated food contact surface of paper and paperboard intended for use in producing, manufacturing, packing, processing, preparing, treating, packaging, transporting, or holding dry food.

6. FDA 21 CFR 177.1010 as semi-rigid and rigid acrylic plastics articles intended for use in contact with food.

This product is limited to use only in plastic articles intended for repeated use in contact with food. The semi-rigid and rigid acrylic plastics in the finished form in which they are to contact food are subject to limitation on extractives.

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

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

**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.**

Information contained in this publication (and otherwise supplied to users) is based on our general experience and is given in good faith, but we are unable to guarantee its accuracy or to accept responsibility in respect of factors outside our knowledge or control.

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