

# Elvacite® 2046

## Acrylic Resin

Elvacite® 2046 is a high molecular weight iso-butyl / n-butyl methacrylate copolymer. Elvacite® 2046 is useful in ceramic coatings and temporary binders. It is soluble in mineral spirits, VM & P Naphtha, and some alcohols.

## Performance Features and Key Benefits

- Ceramic Coatings
- Temporary binders

### Typical Properties<sup>a</sup>

|   |            |
|---|------------|
| Appearance                                | Solid bead |
| Specific Gravity, 25° C                   | 1.08       |
| Glass Transition Temp, onset (calculated) | 33°C       |
| Molecular Weight (Mw)                     | 200,000    |
| Acid Number (mg KOH/g Resin)              | 0          |
| Tensile Strength, psi                     | 2,100      |
| Elongation at break (23° C, 50% RH)       | 175%       |

*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.*

## **Storage & Handling**

Elvacite® 2046 should be stored in a cool, dry place away from heat sources. If possible, do not store at or above the glass transition temperature as resin blocking can occur. If a resin block is formed, extra time and care must be taken to break up the mass for use. Please consult the Material Safety Data Sheet for additional safety information.

## **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.

## Solvent Solubility at 20% solids

|  |   |  |   |                        |   |
|--|---|--|---|------------------------|---|
| <b>Alcohols</b>  |   | Ethyl acetate                            | C | <b>Ketones</b>         |   |
| Methyl Alcohol   | I | Isopropyl acetate                        | C | Acetone                | C |
| Ethyl Alcohol  | I | n-butyl acetate                          | C | Methyl Ethyl Ketone    | C |
| n-propyl Alcohol                                       | C | n-amyl acetate                           | C | Methyl Isobutyl Ketone | C |
| Isopropyl Alcohol                                      | C | Butyl lactate                            | C | Diisobutyl Ketone      | C |
| Isoamyl Alcohol  | C | Propylene glycol monoethyl ether acetate | H | Cyclohexanone          | C |
| Cyclohexanol   | C | Methyl amyl acetate                      | C | Isophorone             | C |
| Ethylene glycol  | I |  |   | Diacetone Alcohol      | C |
| Glycerol   | I | <b>Ethers</b>                            |   | Methyl amyl ketone     | C |
|  |   | Diethyl Ether                            | C |                        |   |
| <b>Amides</b>  |   | Diisopropyl ether                        | I | <b>Nitrile</b>         |   |
| Formamide  | I | Tetrahydrofuran (THF)                    | C | Acetonitrile           | I |
| Dimethyl formamide (DMF)                               | C | "Cellosolve" Solvent                     | C |                        |   |
|  |   |  |   | <b>Nitroparaffins</b>  |   |
| <b>Chlorohydrocarbons</b>                              |   | <b>Hydrocarbons</b>                      |   | Nitromethane           | I |
| Methylene Chloride                                     | C | Toluene                                  | C | Nitroethane            | C |
| Ethylene dichloride                                    | C | Xylene                                   | C |                        |   |
| Perchloroethylene                                      | C | n-Hexane                                 | H |                        |   |
| 1, 1, 1-Trichloroethane                                | C | Cyclohexane                              | C |                        |   |
|  |   | VM & P Naphtha                           | C |                        |   |
| <b>Esters</b>  |   | Turpentine                               | C |                        |   |
| Methyl formate   | C | Mineral Spirits (10% aromatic)           | C |                        |   |
| (C = Clear Solution, H = Hazy Solution, I = Insoluble) |   |  |   |                        |   |

# Resin Compatibility

Elvacite® 2046 is compatible with the following Elvacite® Resin Grades: 2028, 2044, and 2045. It is also compatible with the other types of resins, as illustrated in the following table (C=Clear solution, H=Hazy solution, I=Insoluble):

| Blending Resin                       | Description                             | Form of Blended Resin Tested | Supplier             | Elvacite / Blending Resin*<br>(by solids weight) |       |       |
|--------------------------------------|---|------------------------------|----------------------|--|-------|-------|
| Alkyd                                |   |                              |                      | 75/25  | 50/50 | 25/75 |
| Aroplaz 1271                         | Long linseed drying oil                 | 30% in MEK                   | Reichold             | X  | X     | I     |
| Aroplaz 1351                         | Long castor nondrying oil               | 30% in MEK                   | Reichold             | C  | C     | C     |
| Chempol 13-1410                      | Safflower drying oil, acrylate modified | 50% in Xylene                | Cook Comp & Polymers | --   | I     | I     |
| Paraplex RGA-2/80                    | Nondrying oil, sebacic                  | 80% in nBuAc                 | C P Hall Co          | I  | I     | I     |
| Blagden 3105                         | Short coconut nondrying oil             | 60% in Xylene                | Blagden Chemicals    | --   | I     | I     |
| Cellulosic                           |   |                              |                      |  |       |       |
| Cellulose acetate 39-5-5B            |   | 30% in Acetone or MEK        | Hoechst-Celanese     | I  | I     | I     |
| Cellulose Acetate Butyrate, ½ - sec. |   | 30% in MEK                   | Eastman Chemical     | H  | I     | 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     |
| Epoxy                                |   |                              |                      |  |       |       |
| Epon 828                             |   | 100% Resin                   | Resolution           | --   | H     | H     |
| Epon 1001                            |   | 30% in MEK                   | Resolution           | I  | I     | I     |
| Elastomers                           |   |                              |                      |  |       |       |
| EMD-504                              | Polyisobutylene                         | 30% in Toluene               | Exxon Chemical       | I  | I     | I     |
| Hypalon 30                           | Clorosulfonated polyethylene            | 15% in Toluene               | Dupont Polymers      | I  | I     | ---   |
| Neoprene AC-Soft                     | Polychloroprene                         | 15% in Toluene               | Dupont Polymers      | I  | I     | ---   |
| Rosin Derivatives                    |   |                              |                      |  |       |       |
| Ester Gum 8L                         |   | 30% in MEK                   | Hercules Inc.        | C  | C     | C     |
| Pentalyn 255                         | Pentaerythritol ester                   | 30% in MEK                   | Hercules Inc.        | I  | H     | H     |
| Pentalyn 830                         | Pentaerythritol ester                   | 30% in MEK                   | Hercules Inc.        | H  | H     | H     |
| Vinyl Chloride Resins                |   |                              |                      |  |       |       |
| UCAR®Solution Vinyl VAGH             | Copolymer                               | 30% in MEK                   | Union Carbide        | C  | C     | C     |
| UCAR®Solution Vinyl VMCH             | Copolymer                               | 30% in MEK                   | Union Carbide        | C  | C     | C     |

|                          |                              |                 |                       |    |    |    |
|--------------------------|------------------------------|-----------------|-----------------------|----|----|----|
| UCAR®Solution Vinyl VYHH | Copolymer                    | 30% in MEK      | Union Carbide         | C  | C  | C  |
| UCAR®Solution Vinyl VYNS | Copolymer                    | 15% in MEK      | Union Carbide         | C  | C  | C  |
| Exon 450                 | Copolymer                    | 15% in MEK      | Freestone<br>Plastics | C  | C  | -- |
| Exon 9290                | Homopolymer                  | 15% in THF      | Freestone<br>Plastics | -- | -- | -- |
| Geon 103 EP              | Homopolymer                  | 15% in THF      | B.F. Goodrich         | -- | -- | -- |
| <b>Other Types</b>       |                              |                 |                       |    |    |    |
| Arochem 650              | Maleic-modified hard resin   | 30% in MEK      | Reichold              | C  | C  | C  |
| Aroset 4110              | Acrylic resin                | 30% in MEK      | Reichold              | H  | H  | H  |
| Dammar                   |                              | 30% in Toluene  |                       | I  | I  | H  |
| DC-840                   | Silicone resin               | 60% in Toluene  | Dow Corning<br>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.          | I  | I  | I  |
| Shellac                  |                              | 30% in Methanol |                       | H  | I  | I  |
| Super-Bechacite 2000     | Permanently fusible phenolic | 30% in MEK      | Reichold<br>Chemicals | C  | C  | C  |

## Plasticizer Compatibility

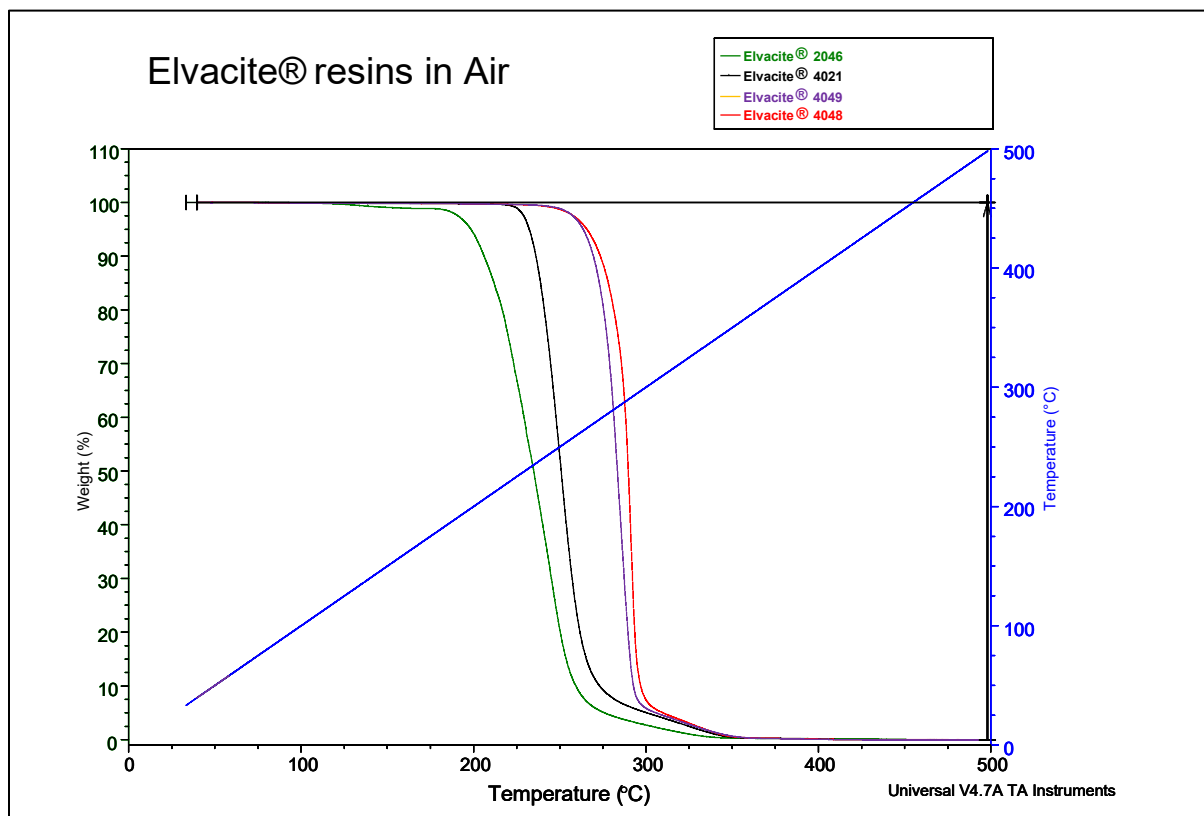
Softening of Elvacite® 2046 is preferably accomplished by blending with Elvacite® 2044.

## Viscosity

Table II illustrates typical viscosities of Elvacite® 2046 by varying both solvent and resin concentration.

| Table II: Elvacite® 2046 Viscosity (cP) |                          |      |        |
|---|--------------------------|------|--------|
| Solvent                                 | Concentration (% Solids) |      |        |
|   | 20%                      | 30%  | 40%    |
| Toluene                                 | 70                       | 200  | 800    |
| Methyl Ethyl Ketone                     | 20                       | 90   | 700    |
| Isopropyl Acetate                       | 25                       | 170  | 1200   |
| Cellosolve Solvent                      | 900                      | 3000 | >25000 |
| Isopropyl Alcohol                       | 900                      | 7000 | >25000 |
| Mineral Spirits (10% aromatic)          | 200                      | 800  | 6000   |

# Thermal Gravimetric Analysis



## **COMPLIANCE WITH FDA REGULATIONS revised April 1, 2019**

**Pasadena, Texas, USA      Grade: ELVACITE® 2046**

**Issue date: December 2019**

We, MITSUBISHI CHEMICAL AMERICA, INC., Specialty Resins Division, confirm that Elvacite® 2046 complies with the compositional requirements of the following United States of America's Food and Drug Administration (FDA) regulations.

Elvacite® 2046 is cleared for use under the FDA 21 CFR 175.105 for adhesives used as components of articles intended for use in the packaging, transporting, or holding food.

Elvacite® 2046 is cleared for use under 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.

Elvacite® 2046 is cleared for use under 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.

Elvacite® 2046 is not cleared for use under 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.

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

Elvacite® 2046 is cleared for use under 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.

Elvacite® 2046 is not cleared under FDA 21 CFR 177.1010 as semirigid and rigid acrylic plastics articles intended for use in contact with food. The semirigid 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.**

# Pasadena, Texas, USA

Issue date: January 2022

Mitsubishi Chemical America, Inc., Specialty Resins Division hereby certifies that the country chemical inventory status of Elvacite® 2046 is as follows.

| US               | CA  | AU   | CN    | KR   | NZ    | PH    | TW   | JP   | Russian Federation        | TH  | Vietnam |
|------------------|-----|------|-------|------|-------|-------|------|------|---------------------------|-----|---------|
| TSCA             | DSL | AIIC | IECSC | KECI | NZIoC | PICCS | TCSI | ENCS | Unified list of chemicals | DIW | NCI     |
| Listed as Active | Y   | Y    | Y     | Y    | Y     | Y     | Y    | Y    | Y                         | N   | Y       |

Y: Listed

N: Not Listed



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

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