

### FATTY ACID MODIFIED BISPHENOL A EPOXY DIACRYLATE

## INTRODUCTION

EBECRYL® 3411 is a fatty acid modified bisphenol A epoxy diacrylate resin with relatively low viscosity, good flow and leveling, and excellent pigment wetting properties. Films of EBECRYL® 3411 cured by ultraviolet light (UV) or electron beam (EB) demonstrate high gloss, a degree of toughness and good chemical resistance.

## PERFORMANCE HIGHLIGHTS

EBECRYL® 3411 is characterized by:

- Relatively low viscosity
- Good cure response
- Excellent pigment wetting
- Good flow and leveling
- Good hydrophilic-lipophilic balance for lithography

UV/EB cured products based on EBECRYL® 3411 are characterized by the following performance properties:

- Good chemical resistance
- High gloss
- Higher flexibility than standard bisphenol A epoxy acrylates

The actual properties of UV/EB cured products also depend on the selection of other formulation components such as reactive diluents, additives and photo initiators.

## SUGGESTED APPLICATIONS

Formulated UV/EB curable products containing EBECRYL® 3411 may be applied via flexographic, lithographic and screen printing as well as direct or reverse roll, offset gravure, metering rod, slot die, knife over roll, air knife, curtain, immersion and spin coating methods. EBECRYL® 3411 is recommended for use in:

- Clear coatings for paper
- Lithographic, flexographic, and screen ink vehicles
- Overprint varnishes
- Metal decorating inks and clear coatings
- Coatings for rigid and flexible plastics

## SPECIFICATIONS

Acid value, mg KOH/g	max. 2.6
Appearance, 60°C	Clear Liquid
Color, Gardner	max. 6
Epoxy content, %	max. 0.2
Viscosity, 60°C, mPa.s	720 - 1080

## TYPICAL PHYSICAL PROPERTIES

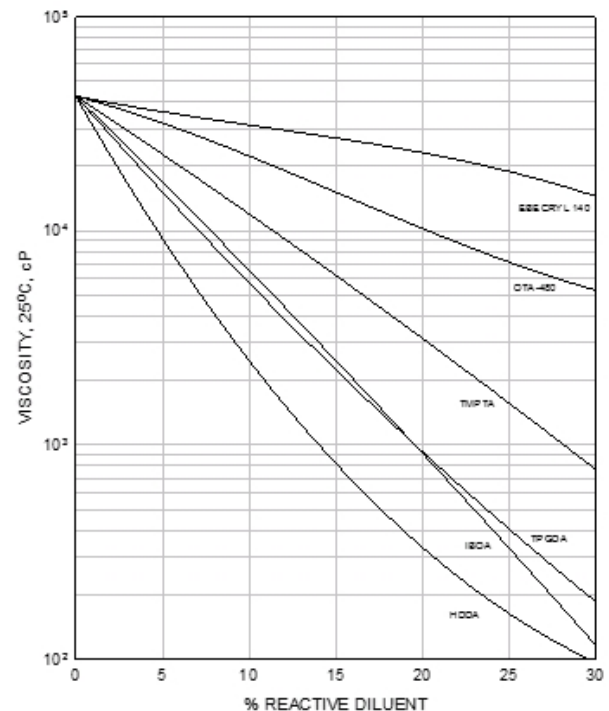
Density, g/cm <sup>3</sup> at 25°C	1.13
Functionality, theoretical	2
Oligomer, % by weight	100

## TYPICAL CURED PROPERTIES

Tensile strength, psi (MPa)	7100 (50)
Elongation at break, %	9
Young's modulus, psi (MPa)	153000 (1076)

## GRAPH I

EBECRYL® 3411 - VISCOSITY REDUCTION WITH REACTIVE DILUENTS



## VISCOSITY REDUCTION

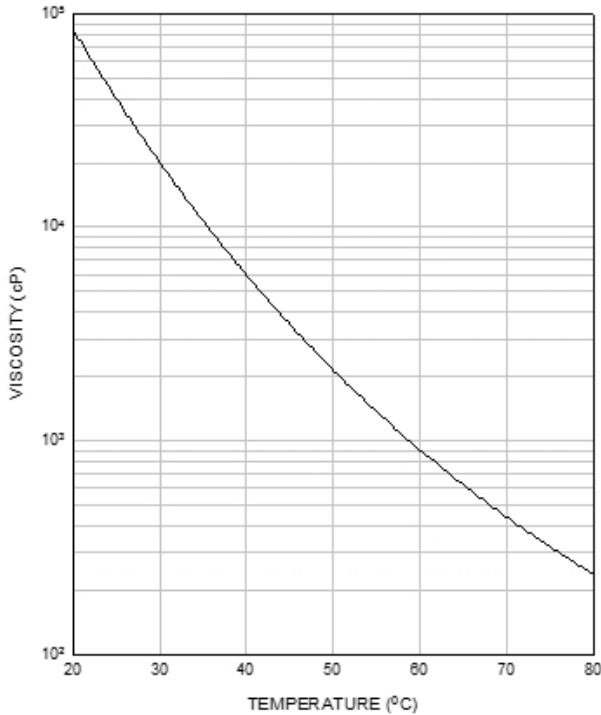
Graph I shows the viscosity reduction of EBECRYL® 3411 with 1,6-hexanediol diacrylate (HDDA)<sup>(1)</sup>, isobornyl acrylate (IBOA)<sup>(1)</sup>, propoxylated glycerol triacrylate (OTA-480)<sup>(1)</sup>, trimethylolpropane triacrylate (TMPTA)<sup>(1)</sup>, tripropylene glycol diacrylate (TPGDA)<sup>(1)</sup> and ditrimethylolpropane tetraacrylate (EBECRYL® 140)<sup>(1)</sup>. Although viscosity reduction can be achieved with non-reactive solvents, reactive diluents are preferred because they are essentially 100 percent converted during UV/EB exposure to form a part of the coating or ink, thus avoiding solvent emissions. The specific reactive diluents used will influence performance properties such as hardness and flexibility.

<sup>(1)</sup> product of allnex

Graph II illustrates the change in viscosity of EBECRYL® 3411 with increasing temperature.

**GRAPH II**

EBECRYL® 3411 - VISCOSITY VS. TEMPERATURE



**PRECAUTIONS**

Before using EBECRYL® 3411, see the Safety Data Sheet (SDS) for information on the identified hazards of the material and the recommended personal protective equipment and procedures.

**STORAGE AND HANDLING**

Care should be taken not to expose the product to high temperature conditions, direct sunlight, ignition sources, oxidizing agents, alkalis or acids. This might cause uncontrollable polymerization of the product with the generation of heat. Storage and handling should be in stainless steel, amber glass, amber polyethylene or baked phenolic lined containers. Procedures that remove or displace oxygen from the material should be avoided. Do not store this material under an oxygen free atmosphere. Dry air is recommended to displace material removed from the container. Wash thoroughly after handling. Keep container tightly closed. Use with adequate ventilation. See the SDS for the recommended storage temperature range for EBECRYL® 3411.