

EBECRYL® 450

Fatty Acid Modified Polyester Hexaacrylate

March 2017



INTRODUCTION

EBECRYL 450 is a fatty acid modified polyester hexaacrylate. Because of the special structure of the backbone and the high acrylic functionality, EBECRYL 450 provides the proper hydrophilic-lipophilic balance necessary for lithography, combined with high reactivity when cured by ultraviolet light (UV) or an electron beam (EB). Lithographic inks based on EBECRYL 450 display outstanding printing qualities, including excellent ink transfer, good dot definition, and proper tack and rheological properties.

PERFORMANCE HIGHLIGHTS

EBECRYL 450 is characterized by:

- Rheology suited for lithographic inks
- Fast cure response
- Good pigment wetting
- Good lithographic behavior

UV/EB cured products containing EBECRYL 450 are characterized by the following performance properties:

- High abrasion resistance
- Good hardness
- Good solvent resistance

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

SUGGESTED APPLICATIONS

Formulated UV/EB curable products containing EBECRYL 450 may be applied via lithographic, screen or gravure printing, or direct or reverse roll and curtain coating methods. EBECRYL 450 is recommended for:

- Fast curing lithographic inks and clear varnishes
- Improving lithographic behavior as an additive

TYPICAL TACK RANGES⁽¹⁾

Oligomer / Reactive diluent	Tack, g-m
EBECRYL 450	3-5
EBECRYL 450 / 5% OTA 480 ⁽²⁾	3-4
EBECRYL 450 / 10% OTA-480	2-3
EBECRYL 450 / 5% TPGDA ⁽²⁾	3-4
EBECRYL 450 / 10% TPGDA	2-3

(1) 400 RPM, 90°F, 3 minutes; Thwing-Albert Electronic Inkometer
 (2) OTA-480 (propoxylated glycerol triacrylate) and TPGDA (tripropylene glycol diacrylate) are products of Allnex.
 (3) Theoretical determination based on the undiluted oligomer.
 (4) UV cured 125 μ thick films.
 (5) Determined by Dynamic Mechanical Analysis.

SPECIFICATIONS

	VALUE
Acid value, mg KOH/g, max.	20
Acidity, % acrylic acid, max.	0.30
Appearance	Clear liquid
Residual solvent, %, max.	0.10
Viscosity, 25°C, cP/mPa·s	6000-9000

TYPICAL PHYSICAL PROPERTIES

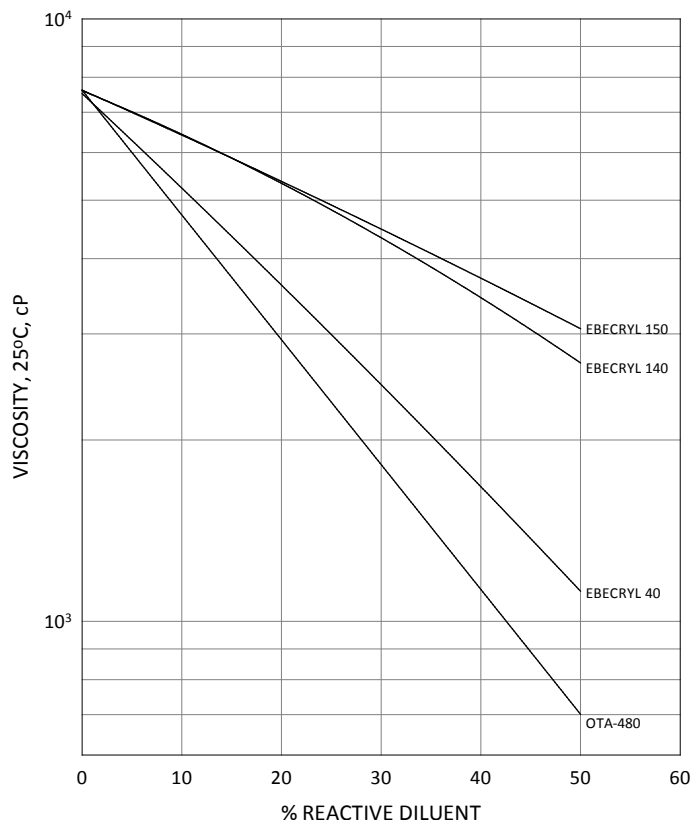
Density, g/ml at 25°C	1.12
Functionality, theoretical ⁽³⁾	6
Oligomer, % by weight	>80
Acrylated polyol, % by weight	<20

TYPICAL CURED PROPERTIES⁽⁴⁾

Tensile strength, psi (MPa)	4300 (30)
Elongation at break, %	4
Young's modulus, psi (MPa)	150000 (1034)
Glass transition temperature, °C ⁽⁵⁾	17

GRAPH I

EBECRYL 450 - VISCOSITY REDUCTION WITH REACTIVE DILUENTS



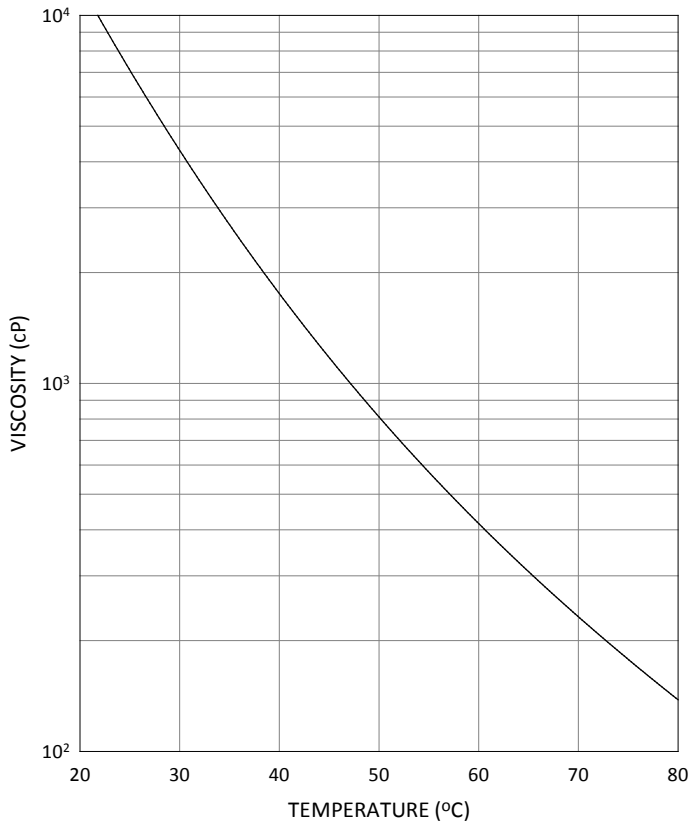
VISCOSITY REDUCTION

Graph I show the viscosity reduction of EBECRYL 450 with the reactive diluents EBECRYL 40⁽¹⁾, EBECRYL 140⁽¹⁾ (ditrimethylolpropane tetraacrylate), EBECRYL 150⁽¹⁾ (ethoxylated bisphenol A diacrylate), and OTA-480. 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.

Graph II illustrates the change in viscosity of EBECRYL 450 with increasing temperature.

GRAPH II

EBECRYL 450 - VISCOSITY VS. TEMPERATURE



PRECAUTIONS

Before using EBECRYL 450, 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 450.

Please refer to the allnex Guide to Safety and Handling of Acrylate Oligomers and Monomers for additional information on the safe handling of acrylates.

(1) Product of allnex

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