TECHNICAL DATASHEET

EBECRYL® 657

Polyester Tetraacrylate

March 2017

EBECRYL® UV/EB Energy Curable Resins

INTRODUCTION

EBECRYL 657 is a polyester tetraacrylate developed specifically for ultraviolet light (UV) and electron beam (EB) cured lithographic ink formulations. EBECRYL 657 provides the proper hydrophilic-lipophilic balance necessary for lithography, good pigment wetting, and low misting. It can be blended with epoxy acrylates or EBECRYL 436 or EBECRYL 438 to increase cure speed.

PERFORMANCE HIGHLIGHTS

EBECRYL 657 is characterized by:

- Good pigment wetting
- Excellent lithographic behavior
- Good anti-misting properties

UV/EB cured products based on EBECRYL 657 are characterized by the following performance properties:

- Toughness
- Flexibility
- Low residual odor

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 657 may be applied via various coating methods, such as direct or reverse roll, and curtain coating. EBECRYL 657 is recommended for:

- Lithographic inks and varnishes
- Coatings on paper, metal, and plastic
- Pigment grinding vehicles

TYPICAL TACK RANGES[1]

Oligomer / Reactive diluent	Tack, g-m
EBECRYL 657	22-24
EBECRYL 657 / 5% OTA 480[2]	18-20
EBECRYL 657 / 10% OTA-480	11-13
EBECRYL 657 / 5% TPGDA[2]	17-19
EBECRYL 657 / 10% TPGDA	8-10

SPECIFICATIONS

	Value
Acid value, mg KOH/g, max.	20
Appearance	Dark clear liquid
Viscosity, 60°C, cP/mPa·s	3000-4000

TYPICAL PHYSICAL PROPERTIES

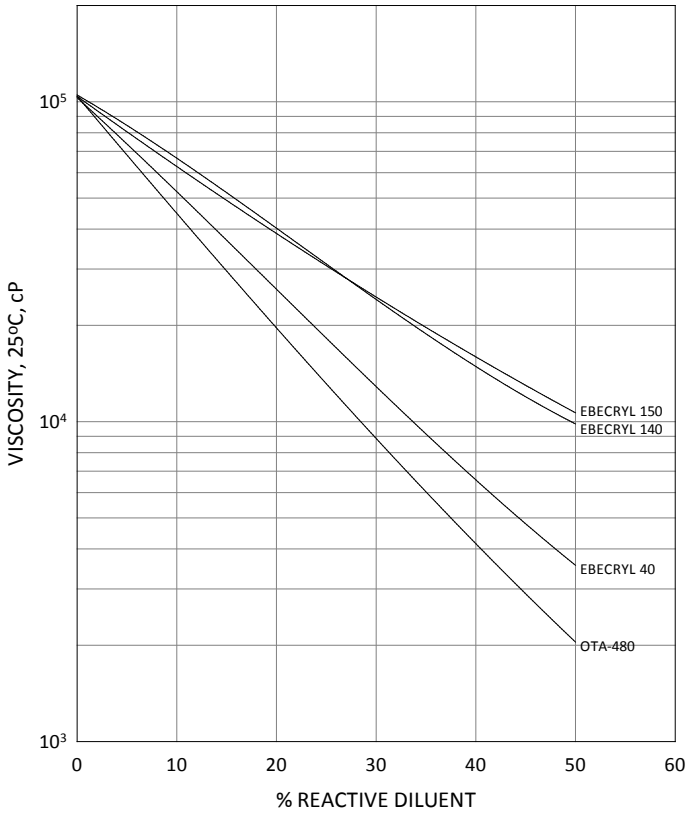
Density, g/ml at 25°C	1.03
Functionality, theoretical[3]	4
Oligomer, % by weight	100

TYPICAL CURED PROPERTIES[4]

Tensile strength, psi (MPa)	4300 (30)
Elongation at break, %	23
Glass transition temperature, °C[5]	33

GRAPH I

EBECRYL 657 - VISCOSITY REDUCTION WITH REACTIVE DILUENTS



(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.

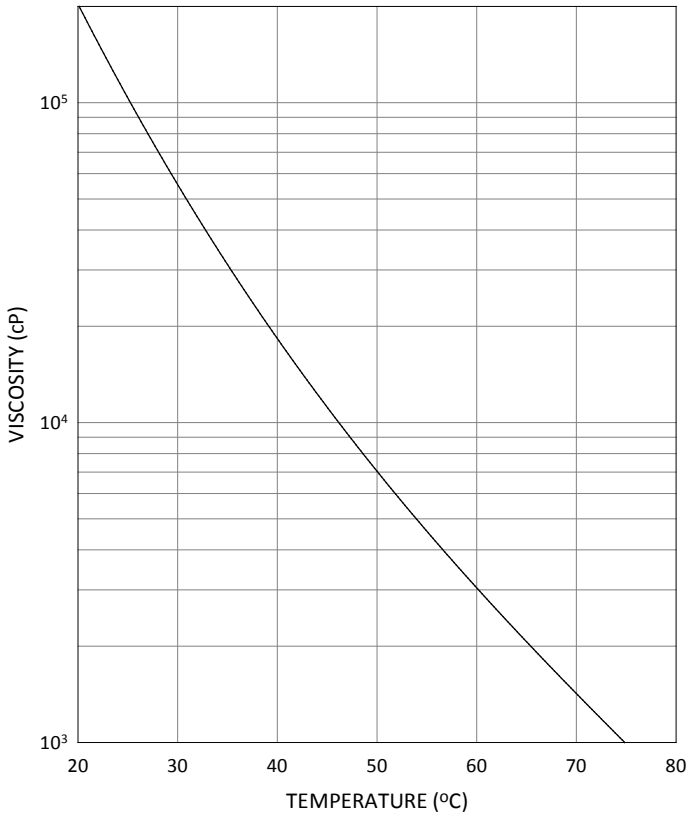
VISCOSITY REDUCTION

Graph I show the viscosity reduction of EBECRYL 657 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 657 with increasing temperature.

GRAPH II

EBECRYL 657 - VISCOSITY VS. TEMPERATURE



PRECAUTIONS

Before using EBECRYL 657, 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 657.

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

www.allnex.com