TECHNICAL DATASHEET

EBECRYL® UV/EB Energy Curable Resins

EBECRYL® 80

Amine Modified Polyether Tetraacrylate

March 2018

INTRODUCTION

EBECRYL 80 is an amine modified polyether tetraacrylate that exhibits relatively low viscosity and exceptionally fast cure via exposure to ultraviolet light (UV). Films of EBECRYL 80 cured by UV or electron beam (EB) demonstrate high gloss, good solvent resistance and low residual odor. EBECRYL 80 is especially suited for fast curing UV overprint varnishes, and due to its low viscosity and good pigment wetting characteristics, is also recommended for UV flexo inks.

PERFORMANCE HIGHLIGHTS

EBECRYL 80 is characterized by:

- Very fast cure response
- Low viscosity
- Light color

UV/EB cured products containing EBECRYL 80 are characterized by the following performance properties:

- High gloss
- Good solvent resistance
- Low residual odor

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

SUGGESTED APPLICATIONS

Formulated UV/EB curable products containing EBECRYL 80 may be applied via direct or reverse roll, offset gravure, metering rod, slot die, knife over roll, air knife, curtain, immersion and spin coating methods as well as flexographic and screen printing. EBECRYL 80 is recommended for use in:

- Fast curing overprint varnishes
- Clear coatings for wood, paper and plastics
- Top coats for wood
- Flexographic inks and coatings
- Screen inks and coatings
- Wood fillers

Table 1 compares the cure response of EBECRYL 80 with a polyester acrylate other polyether acrylates and demonstrates the faster reactivity of amine modified polyether acrylates. EBECRYL 80 is notable for exhibiting the highest reactivity.

SPECIFICATIONS	VALUE
Appearance	Clear liquid
Color, Pt-Co scale(1), max.	200
Viscosity, 25°C, cP/mPa·s	2700-3300

TYPICAL PHYSICAL PROPERTIES

Density, g/ml at 25°C	1.11
Functionality, theoretical(2)	4
Oligomer, % by weight	100
Weight/amine, theoretical	920

TYPICAL CURED PROPERTIES(3)

Tensile strength, psi (MPa)	6800 (47)
Elongation at break, %	7
Young's modulus, psi (MPa)	190000 (1310)
Glass transition temperature, °C(4)	50

TABLE 1: UV CURE RESPONSE COMPARISON

	A	B	C	D
EBECRYL 810(5)	100(6)	-	-	-
EBECRYL 80	-	100	-	-
EBECRYL 81(7)	-	-	100	-
EBECRYL 83(8)	-	-	-	100
Photointiator(9)	3	3	3	3
Photosensitizer(10)	2	2	2	2
Viscosity at 25°C, cP/mPa·s	504	3350	139	622
UV energy(11), mJ/cm^2	640	<90	230	110
Cure speed, fpm	30	200	110	155

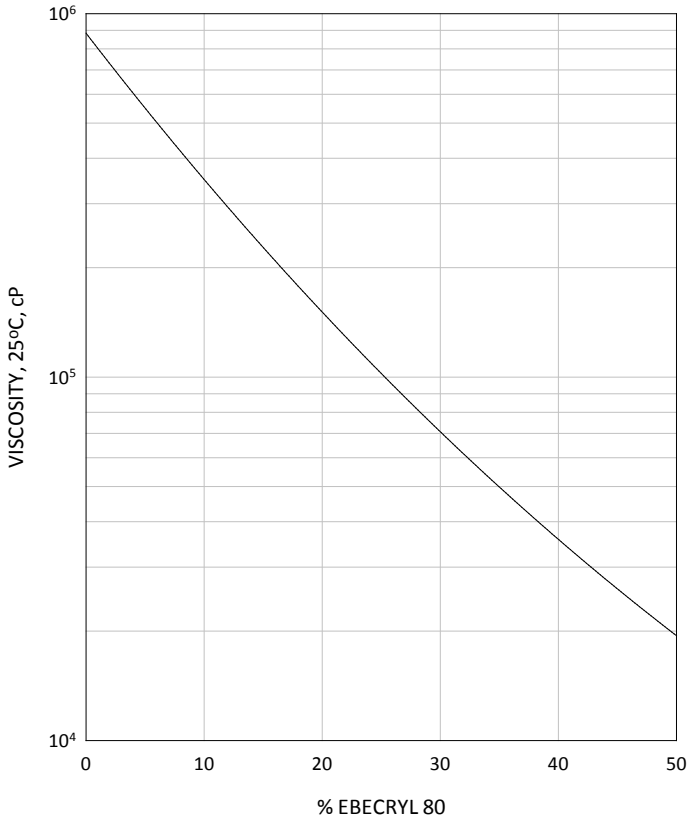
(1) Also referred to as APHA color.
(2) Theoretical determination based the undiluted oligomer.
(3) UV cured 125 µ thick films.
(4) Determined by Dynamic Mechanical Analysis.
(5) EBECRYL 810 is a tetrafunctional polyester acrylate, product of Allnex
(6) Parts by weight
(7) EBECRYL 81 is a 2.5 functional amine modified polyether acrylate, Allnex
(8) EBECRYL 83 is a tetrafunctional amine modified polyether acrylate, Allnex
(9) 2-hydroxy-2-methyl-1-phenyl propanone, e.g. Speedcure 73 product of Lambson
(10) Benzophenone
(11) Coatings were applied to aluminum test panels at ~12 µ thickness and cured with one 300 watt/inch Fusion H lamp at the minimum UV energy required to achieve a mar free surface.

VISCOSITY REDUCTION

Graph I shows the viscosity reduction of EBECRYL 3700(1) when diluted with EBECRYL 80.

GRAPH I

EBECRYL 80 - VISCOSITY REDUCTION OF EBECRYL 3700



PRECAUTIONS

Before using EBECRYL 80, 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 80.

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