

EBECRYL® 81

Amine Modified Polyether Acrylate

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INTRODUCTION

EBECRYL 81 is an amine modified polyether acrylate that exhibits very low viscosity and fast cure via exposure to ultraviolet light (UV). Films of EBECRYL 81 cured by UV or electron beam (EB) demonstrate high gloss and low residual odor. EBECRYL 81 is especially suited to applications requiring low viscosity and fast UV cure, including overprint varnishes and flexographic inks.

PERFORMANCE HIGHLIGHTS

EBECRYL 81 is characterized by:

- Very low viscosity
- Fast cure response
- Light color

UV/EB cured products based on EBECRYL 81 are characterized by the following performance properties:

- High gloss
- 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 81 may be applied via direct or reverse roll, offset gravure, metering rod, slot die, knife over roll, air knife, curtain, immersion, vacuum, spin and spray coating methods, as well as flexographic printing. EBECRYL 81 is recommended for use in:

- Overprint varnishes
- Clear coatings for wood, paper and plastics
- Top coats for wood
- Flexographic inks and varnishes

Table 1 compares the cure response of EBECRYL 81 with a polyester acrylate other amine modified polyether and demonstrates the faster reactivity of amine modified polyether acrylates. EBECRYL 81 is notable for its combination of low viscosity with good reactivity.

SPECIFICATIONS

	VALUE
Appearance	Clear liquid
Color, Gardner scale, max.	2
Viscosity, 25°C, cP/mPa-s	80-120

TYPICAL PHYSICAL PROPERTIES

Density, g/ml at 25°C	1.08
Functionality, theoretical ⁽¹⁾	2.5
Weight/amine, theoretical	1079

TYPICAL CURED PROPERTIES⁽²⁾

Tensile strength, psi (MPa)	790 (5.5)
Elongation at break, %	8
Young's modulus, psi (MPa)	16000 (110)
Glass transition temperature, °C ⁽³⁾	-18

TABLE 1: CURE RESPONSE COMPARISON

EBECRYL 810 ⁽⁴⁾	100 ⁽⁵⁾	-	-	-
EBECRYL 80 ⁽⁶⁾	-	100	-	-
EBECRYL 81	-	-	100	-
EBECRYL 83 ⁽⁷⁾	-	-	-	100
Photoinitiator ⁽⁸⁾	3	3	3	3
Photosensitizer ⁽⁹⁾	2	2	2	2
Viscosity at 25°C, cP/mPa-s	504	3350	139	622
UV energy ⁽¹⁰⁾ , mJ/cm ²	640	<90	230	110
Cure speed, fpm	30	200	110	155

(1) Theoretical determination based the undiluted oligomer.

(2) UV cured 125 μ thick films.

(3) Determined by Dynamic Mechanical Analysis.

(4) EBECRYL 810 is a tetrafunctional polyester acrylate, product of allnex.

(5) Parts by weight

(6) EBECRYL 80 is a tetrafunctional amine modified polyether acrylate, allnex.

(7) EBECRYL 83 is a tetrafunctional amine modified polyether acrylate, allnex.

(8) 2-hydroxy-2-methyl-1-phenyl propanone, e.g. Speedcure 73 product of Lambson

(9) Benzophenone

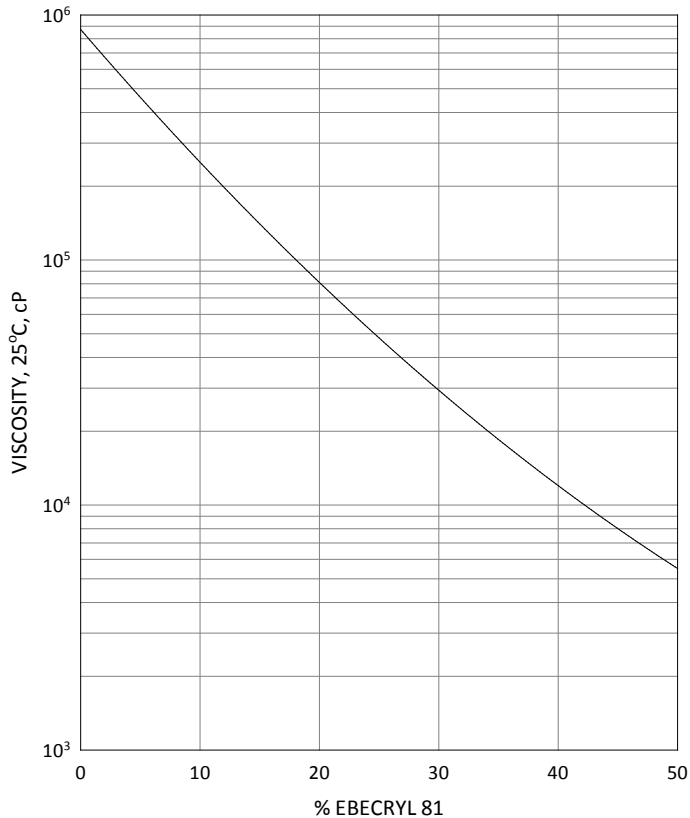
(10) Coatings were applied to aluminum test panels at ~12 μ thickness and cured with one 300 watt/inch Fusion H lamp at the minimum UV energy required to achieve a mar free surface.

VISCOSITY REDUCTION

Graph 1 shows the viscosity reduction of EBECRYL 3700⁽¹⁾ when diluted with EBECRYL 81.

GRAPH 1

EBECRYL 81 - VISCOSITY REDUCTION OF EBECRYL 3700



PRECAUTIONS

Before using EBECRYL 81, 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 81.

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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