

### ALIPHATIC URETHANE DIACRYLATE

## INTRODUCTION

EBECRYL® 8809 is a difunctional aliphatic urethane acrylate that does not contain any intentionally added organic tin compounds, heavy metals\*, hydroquinone (HQ) or methyl ether of hydroquinone (MEHQ). (Please note that quinones are present in many raw materials, so the overall quinone content is reduced, but not zero in EBECRYL® 8809.) Films of EBECRYL® 8809 cured by ultraviolet light (UV) or electron beam (EB) exhibit excellent exterior durability, toughness, and resistance to yellowing. EBECRYL® LEO 10501 is present at 5% in this product.

\*As defined by C.O.N.E.G's Toxic in Packaging Legislation, the ASTM Standard Consumer Safety Specification on Toy Safety F 963 (ASTM F 963-08), or the EU Directive 94/62/EC (and amendments) on packaging and packaging waste.

## PERFORMANCE HIGHLIGHTS

EBECRYL® 8809 is characterized by:

- No intentionally added tin, heavy metals\*, or quinones
- Light color
- No diluting monomers

UV/EB cured products containing EBECRYL® 8809 are characterized by the following performance properties:

- Regulation friendly for tin, heavy metals\*, and quinones
- Excellent exterior durability
- Excellent toughness
- Non-yellowing

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® 8809 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 screen printing. EBECRYL® 8809 is recommended for use in:

- Applications that must meet regulations for tin, heavy metal\*, and quinone content Screen inks and coatings on various substrates
- Non-yellowing, exterior durable coatings
- Coatings for wood and plastics

## TYPICAL PROPERTIES

Appearance	Clear liquid
Color, Gardner	max. 1
Density, g/cm <sup>3</sup> at 25°C	1.18
Functionality, theoretical	2
HQ/MEHQ Content, ppm	<10/<10 <sup>(1)</sup>
Oligomer, % by weight	95
NCO, %	max. 0.2
Viscosity, 60°C, mPa.s	16000

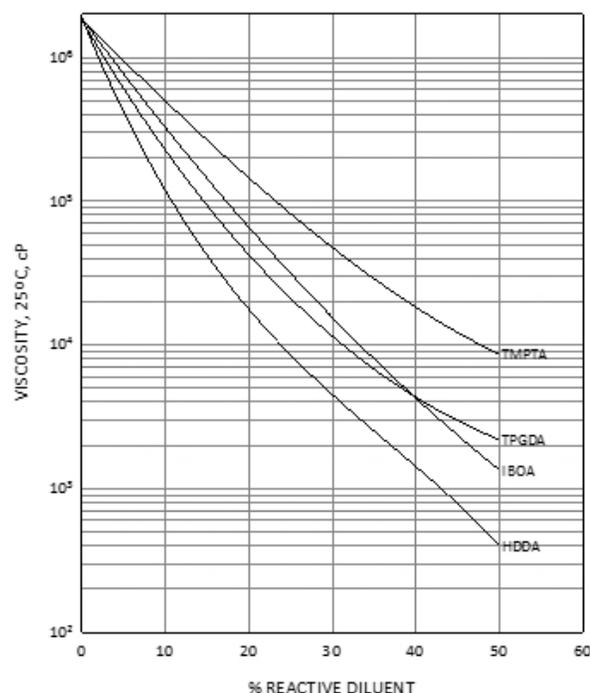
<sup>(1)</sup> amount detected via HPLC with a UV detector

## TYPICAL CURED PROPERTIES

Tensile strength, psi (MPa)	4200 (29)
Elongation at break, %	30
Young's modulus, psi (MPa)	127500 (880)
Glass transition temperature, °C	66

## GRAPH I

EBECRYL® 8809 - VISCOSITY REDUCTION WITH REACTIVE DILUENT



## VISCOSITY REDUCTION

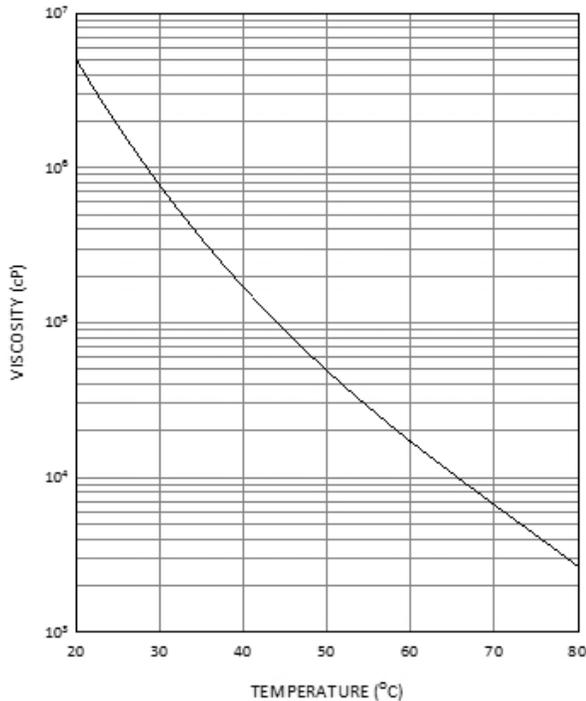
Graph I shows the viscosity reduction of EBECRYL® 8809 with 1,6-hexanediol diacrylate (HDDA)<sup>(2)</sup>, isobornyl acrylate (IBOA)<sup>(1)</sup>, tripropylene glycol diacrylate (TPGDA)<sup>(2)</sup> and trimethylolpropane triacrylate (TMPTA)<sup>(2)</sup>. Although viscosity reduction can be achieved 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 reducing solvent emissions. The specific reactive diluents used will influence performance properties such as hardness and flexibility.

<sup>(2)</sup> product of allnex

Graph II illustrates the change in viscosity of EBECRYL® 8809 with increasing temperature.

**GRAPH II**

EBECRYL® 8809 - VISCOSITY VS. TEMPERATURE



**PRECAUTIONS**

Before using EBECRYL® 8809, 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. EBECRYL® 8809 may be delivered in the form of a high viscous foam. Before usage, this foam can be removed by heating containers of EBECRYL® 8809 to a uniform temperature of 80°C for several days. Ovens or hotboxes are recommended methods of heating.

See the SDS for the recommended storage temperature range for EBECRYL® 8809.