

EBECRYL[®] 8807

Aliphatic Urethane Acrylate

INTRODUCTION

EBECRYL 8807 is an aliphatic urethane diacrylate that exhibits rapid surface cure response, light color and moderate viscosity. Films of EBECRYL 8807 cured by ultraviolet light (UV) or electron beam (EB) exhibit good flexibility, toughness, abrasion resistance, and are resistant to yellowing.

PERFORMANCE HIGHLIGHTS

EBECRYL 8807 is characterized by:

- Excellent surface cure in air
- Moderate viscosity
- Light color

UV/EB cured products based on EBECRYL 8807 are characterized by the following performance properties:

- Good flexibility and toughness
- Abrasion resistance
- 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 photoinitiators.

SUGGESTED APPLICATIONS

Formulated UV/EB curable products containing EBECRYL 8807 may be applied via direct or reverse roll, offset gravure, metering rod, slot die, knife over roll, air knife, curtain and immersion coating methods. EBECRYL 8807 is recommended for use in:

- Coatings for wood, cement and composite flooring
- Adhesives or sealants cured with low intensity lamps
- Flexible coatings requiring rapid cure in air

Table I compares the surface cure response of EBECRYL 8807 with three commercial acrylated aliphatic urethanes. All were formulated to equal oligomer content. EBECRYL 8807 requires a significantly lower UV dose to achieve surface cure.

Table I
Comparison of Surface Cure Response

	A	B	C	D
EBECRYL 8807	35.0			
EBECRYL 284-N ⁽¹⁾		40.0		
EBECRYL 4866 ⁽¹⁾			50.0	
Competitive aliphatic urethane acrylate				46.7
TRPGDA ⁽²⁾	40.0	35.0	25.0	28.3
TMPTA-N ⁽²⁾	25.0	25.0	25.0	25.0
ADDITOL [®] HDMAP ⁽³⁾	4.0	4.0	4.0	4.0
Viscosity at 25°C, cP	408	412	1,696	444
UV energy ⁽⁴⁾ , mJ/cm ²	495	914	640	565

(1) Aliphatic urethane acrylate oligomers; products of Cytec Industries Inc.
 (2) Tripropyleneglycol diacrylate (TRPGDA) and trimethylolpropane triacrylate (TMPTA-N) are products of Cytec S Industries Inc.
 (3) Photoinitiator; product of Cytec Industries Inc.
 (4) Coatings were applied to unlaquered Leneta opacity charts (form N2C) at ~12 μ thickness and cured with one 300 watt/inch Fusion H lamp at the required UV energy to achieve a non-marring surface.

SPECIFICATIONS

	SMT ⁽⁵⁾	Value
Appearance, elevated temp	002-G	Clear
% NCO, max.	091-H	0.2

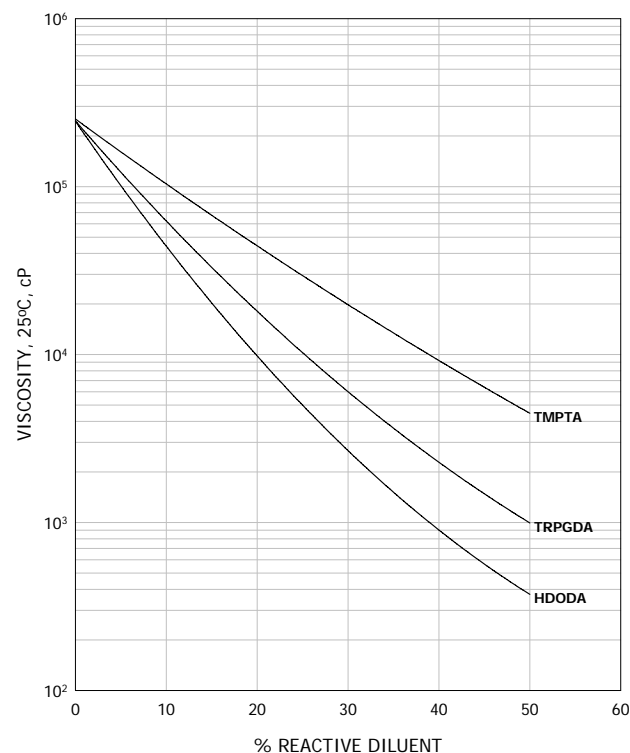
TYPICAL PHYSICAL PROPERTIES

Color, Gardner scale	2
Density, g/ml at 25°C	1.05
Functionality, theoretical ⁽⁶⁾	2
Oligomer, % by weight	100
Viscosity at 60°C, cP	6000-9000

TYPICAL CURED PROPERTIES⁽⁷⁾

Tensile strength, psi	1950
Elongation at break, %	54
Young's modulus, psi	7500
Glass transition temperature, °C ⁽⁸⁾	32

Graph I
EBECRYL 8807
Viscosity Reduction with Reactive Diluents



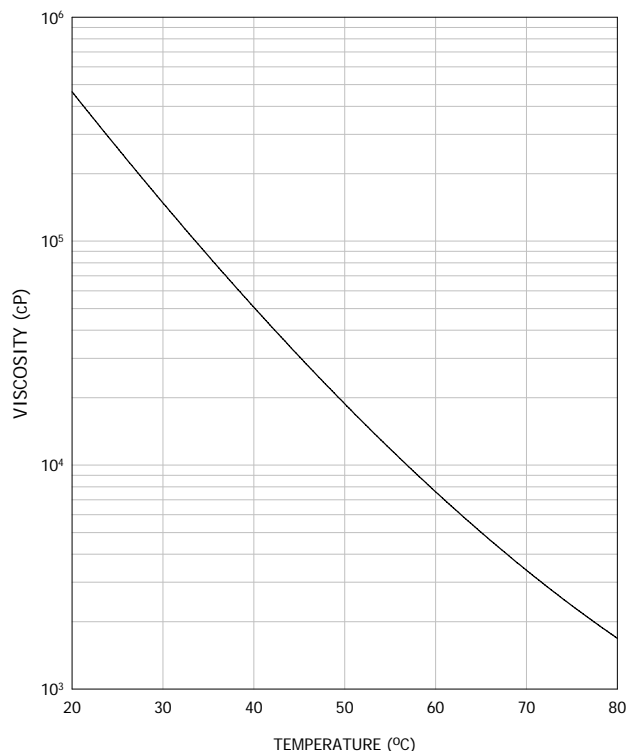
(5) Standard Methods of Testing available upon request.
 (6) Theoretical determination based on the undiluted oligomer.
 (7) UV cured 125 μ thick films.
 (8) Determined by Dynamic Mechanical Analysis.

VISCOSITY REDUCTION

Graph I shows the viscosity reduction of EBECRYL 8807 with 1,6-hexanediol diacrylate (HDODA)⁽¹⁾, trimethylolpropane triacrylate (TMPTA), and tripropylene glycol diacrylate (TRPGDA). 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, thus reducing 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 8807 with increasing temperature.

Graph II
EBECRYL 8807
Viscosity vs. Temperature



(1) Product of Cytec Industries Inc.

STORAGE AND HANDLING

Before using EBECRYL 8807, consult the **Material Safety Data Sheet** for additional information on safety and handling procedures, and recommended personal protective equipment.

The maximum recommended storage temperature for EBECRYL 8807 is 38°C (100°F). High temperature and fire conditions can cause uncontrolled polymerization with rapid evolution of heat and pressure rise, which may result in violent rupture of the storage tanks or containers. Never store in direct sunlight or adjacent to heated compartments. Containers should be kept closed and away from oxidizing agents, acids, alkalis, peroxides, free radical initiators, photosensitizers, rust, and x-ray or ultraviolet radiation. Procedures that displace oxygen from the material, such as sparging with nitrogen, should be avoided.

PRECAUTIONS

Avoid contact with skin and eyes and breathing vapors. Contains materials that may cause injury to the eyes and skin. Sensitization may occur. Skin irritation may not occur immediately and contact may go unnoticed for up to 48 hours. Solvents should not be used to clean skin because of increased penetration potential. Contaminated clothing, shoes, belts and other leather goods should be removed immediately. Incinerate contaminated leather goods, including shoes. Wash contaminated clothing thoroughly before reuse.

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