

ALIPHATIC URETHANE TETRAACRYLATE

INTRODUCTION

EBECRYL® 8314 is an aliphatic urethane tetraacrylate diluted with the reactive diluents isobornyl acrylate (IBOA) and hydroxy propyl methacrylate (HPMA). Films of EBECRYL® 8314 cured by ultraviolet light (UV) or electron beam (EB) have a unique combination of hardness, toughness, flexibility, and abrasion resistance coupled with excellent exterior durability properties. These performance properties make EBECRYL® 8314 ideal for applications such as paint protection, printed electronics, automotive interior film and embossing or thermoforming after cure.

PERFORMANCE HIGHLIGHTS

EBECRYL® 8314 is characterized by:

- Light color
- Low odor
- Moderate viscosity
- < 15% haze after Taber abrasion (100 cycles, CS10F, 500 g)

UV/EB cured products containing EBECRYL® 8314 are characterized by the following performance properties:

- Outstanding toughness
- Excellent abrasion resistance
- Excellent weatherability
- Thermoformable after cure (small to medium draws)
- Good adhesion
- Good hardness
- Flexibility
- 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® 8314 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® 8314 is recommended for use in:

- Automotive paint protection films
- Automotive OEM or Re-finish
- Coatings for plastic and wood requiring excellent exterior durability
- Printed electronics
- Post-formable coatings for plastic, metallized plastic, metal, and conduit substrates
- Optical coatings
- Non-yellowing topcoats for wood
- Exterior durable coatings

TYPICAL PHYSICAL PROPERTIES

Appearance	Clear liquid
Color, Gardner	max. 1
Density, g/cm ³ at 25°C	1.13
Functionality, theoretical	4
NCO, %	max. 0.1
Oligomer, % by weight	79.3
IBOA, % by weight	7.6
HPMA, % by weight	12.1
Viscosity, 25°C, mPa.s	14000

TYPICAL CURED PROPERTIES

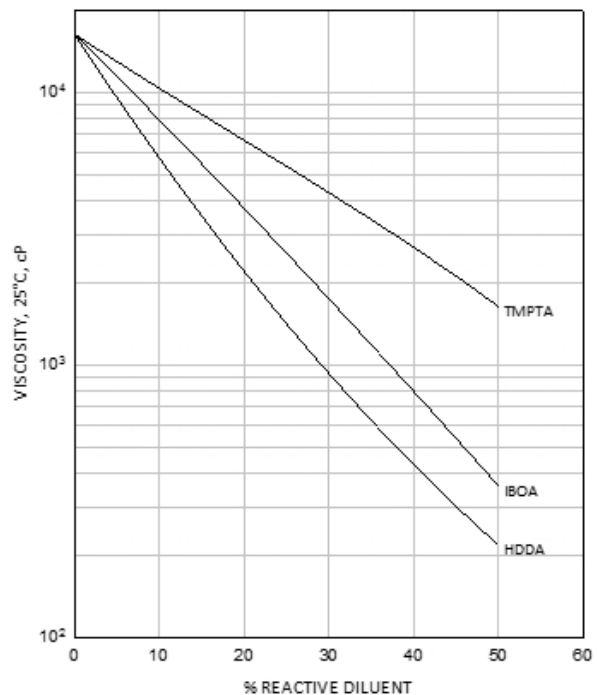
Tensile strength, psi (MPa) ⁽¹⁾	6000 (41)
Elongation at break, % ⁽¹⁾	110
Young's modulus, psi (MPa) ⁽¹⁾	125000 (862)
Glass transition temperature, °C ⁽²⁾	90

⁽¹⁾ UV cured 125 µm thick films

⁽²⁾ Determined by Dynamic Mechanical Analysis

GRAPH I

EBECRYL® 8314 - VISCOSITY REDUCTION WITH REACTIVE DILUENTS



VISCOSITY REDUCTION

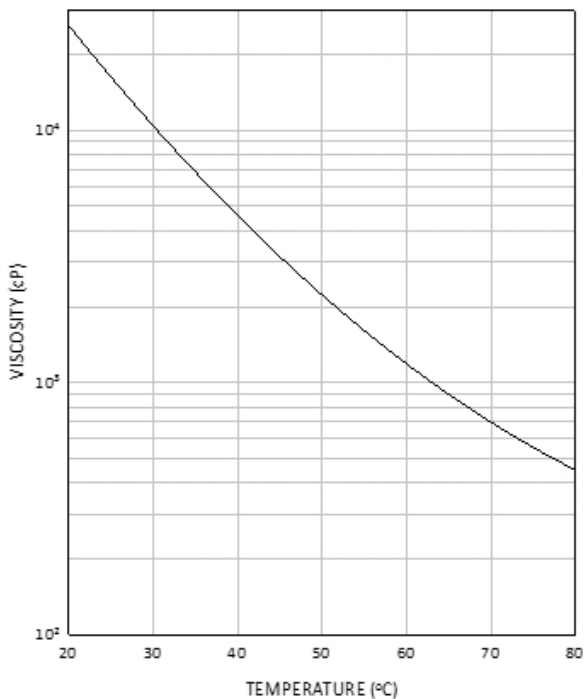
Graph I shows the viscosity reduction of EBECRYL® 8314 with 1,6-hexanediol diacrylate (HDDA)⁽³⁾, isobornyl acrylate (IBOA)⁽³⁾ and trimethylolpropane triacrylate (TMPTA)⁽³⁾. Although viscosity reduction can be achieved with non-reactive solvents, reactive diluents are preferred because they are essentially 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.

⁽³⁾ product of allnex

Graph II illustrates the change in viscosity of EBECRYL® 8314 with increasing temperature.

GRAPH II

EBECRYL® 8314 - VISCOSITY VS. TEMPERATURE



PRECAUTIONS

Before using EBECRYL® 8314, 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® 8314.