

URETHANE ACRYLATE NANOCOMPOSITE

INTRODUCTION

EBECRYL® 8311 is an aliphatic urethane acrylate nanocomposite that exhibits low viscosity and high reactivity in ultraviolet (UV) light or electron beam (EB) curable coatings. EBECRYL® 8311 can be easily incorporated into at any stage of formulating. Films of EBECRYL® 8311 exhibit good weatherability, outstanding hardness, chemical, and scratch and abrasion resistance coupled with very low haze development after abrasion. EBECRYL® 8311 is designed to be used as the main oligomer in formulations requiring a high degree of hardness, scratch, abrasion resistance and low development after abrasion

PERFORMANCE HIGHLIGHTS

EBECRYL® 8311 is characterized by:

- Good compatibility and stability
- Low viscosity
- Light color
- Excellent reactivity
- Outstanding hardness
- Low haze development after abrasion
- No agglomeration or sedimentation
- PETA free

UV/EB cured products containing EBECRYL® 8311 are characterized by the following performance properties:

- Excellent optical clarity
- High gloss
- Toughness (vs. penta- and hexa-functional acrylates)
- Outstanding scratch and abrasion resistance
- Chemical resistance
- Improved barrier properties

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® 8311 may be applied via direct or reverse roll, offset gravure, metering rod, slot die, knife over roll, air knife, curtain, immersion, spin and spray coating methods. EBECRYL 8311 is recommended for:

- Coatings requiring high scratch/abrasion resistance and improved adhesion
- Coatings requiring low development after abrasion resistance
- As a modifying oligomer to increase cure speed, solvent resistance and abrasion resistance

SPECIFICATIONS

Appearance	Clear liquid
Color, Gardner	max. 2
Viscosity, 25°C, mPa.s	7000 - 14000

TYPICAL CURED PROPERTIES

Tensile strength, psi (MPa)	5200 (36)
Elongation at break, %	2.5
Young's modulus, psi (MPa)	500000 (3448)

ABRASION RESISTANCE

Graph I illustrates how the percentage of EBECRYL® 8311 in a coating impacts abrasion resistance. Coatings were applied to 10 mil polycarbonate substrate at ~12 µm thickness and UV cured⁽¹⁾ to achieve a non-marring surface. The coatings were subjected to abrasion⁽²⁾ and haze of the abraded area measured⁽³⁾. The decrease in haze with increasing amounts of EBECRYL 8311 demonstrates improved abrasion resistance.

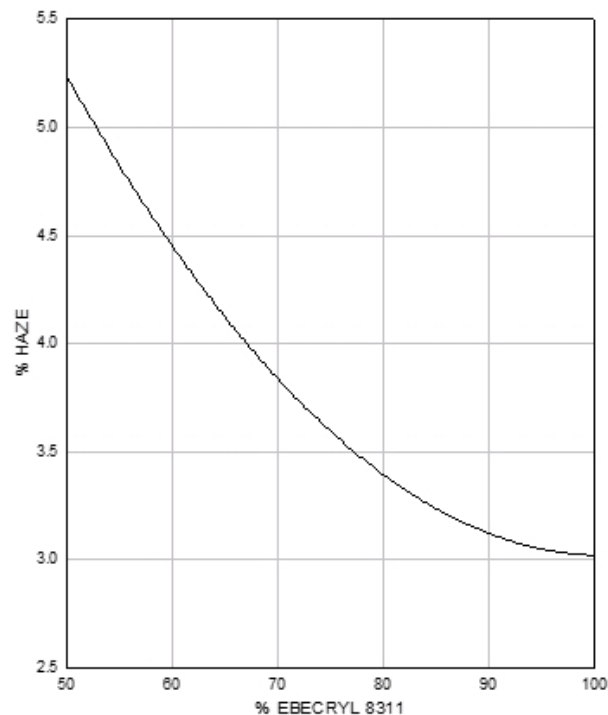
⁽¹⁾ 2-600 watt/inch Fusion type H lamps

⁽²⁾ Taber Industries 5130, 100 cycles, CS 10F wheels, 500 g weights

⁽³⁾ BYK Gardner haze-gard plus

GRAPH I

EBECRYL® 8311 - HAZE DEVELOPMENT AFTER ABRASION



PRECAUTIONS

Before using EBECRYL® 8311, 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® 8311.