EBECRYL® 1291

Technical Datasheet

ALIPHATIC URETHANE HEXAACRYLATE

INTRODUCTION

EBECRYL® 1291 is a hexafunctional urethane acrylate that does not contain any intentionally added organic tin compounds or 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® 1291). It exhibits very fast cure response when exposed to ultraviolet light (UV) or electron beam (EB). Cured Films of EBECRYL® 1291 demonstrate outstanding hardness, scratch and abrasion resistance, chemical resistance, and are resistance to yellowing.

*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 European Standard on Safety of Toys EN 71 Part 3 : 1994 + A1:2000 + A1/AC:2000 + AC:2002.

PERFORMANCE HIGHLIGHTS

EBECRYL® 1291 is characterized by:

- No intentionally added tin, heavy metals*, or quinones
- Fast cure response
- Light color

UV/EB cured products containing EBECRYL® 1291 are characterized by the following performance properties:

- Regulation friendly for tin, heavy metals*, and quinones
- Excellent scratch and abrasion resistance
- High gloss
- High surface hardness
- 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® 1291 may be applied via brush, roller, 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® 1291 is recommended for use:

- In applications that must meet regulations for tin, heavy metal*, and quinone content.
- As an additive to improve cure speed, solvent resistance, and abrasion resistance.
- In scratch and abrasion resistant coatings (hardcoats).
- In clear and pigmented coatings for paper, paperboard, wood, rigid plastics.

SPECIFICATIONS

Appearance	Clear liquid
Color, Apha	max. 75

TYPICAL PHYSICAL PROPERTIES

Viscosity, 60°C, mPa.s	1900
HQ/MEHQ Content, ppm(1)	nd/330(2)
Density, g/cm³ at 25°C	1.16
Functionality, theoretical	6

(1) Typical property. Not measured.

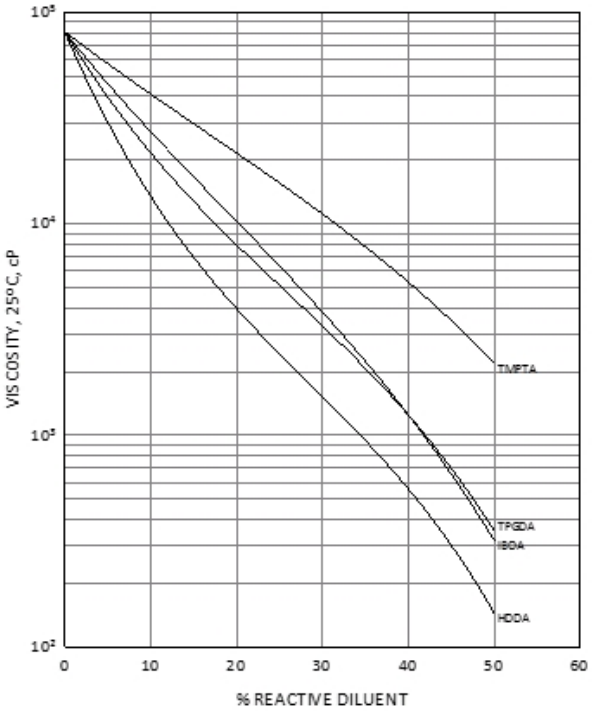
(2) Amount detected via HPLC with a UV detector (nd = none detected).

TYPICAL CURED PROPERTIES

Tensile strength, psi (MPa)	6000 (41.0)
Elongation at break, %	2
Young's Modulus, psi (MPa)	410000(2830)
Glass transition temperature, °C	132

GRAPH I

EBECRYL® 1291 -VISCOSITY REDUCTION WITH REACTIVE DILUENTS



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VISCOSITY REDUCTION

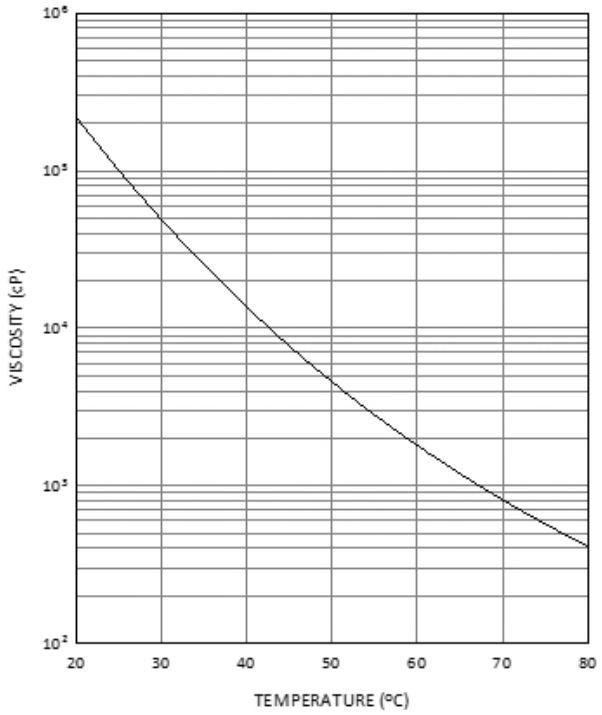
Graph I shows the viscosity reduction of EBECRYL® 1291 with 1,6-hexanediol diacrylate (HDDA)[1], isobornyl acrylate (IBOA)[1], trimethylolpropane triacrylate (TMPTA)[1], and tripropylene glycol diacrylate (TPGDA)[1]. Although viscosity reduction can be achieved with non-reactive solvents, reactive diluents 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.

[1] Product of allnex

Graph II illustrates the change in viscosity of EBECRYL® 1291 with increasing temperature.

GRAPH II

EBECRYL® 1291 - VISCOSITY VS. TEMPERATURE



PRECAUTIONS

Before using EBECRYL® 1291, 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® 1291.

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