

# EBECRYL® 8604

Aliphatic Urethane Tetraacrylate

February 2019



## INTRODUCTION

EBECRYL 8604 is an aliphatic urethane tetraacrylate. As the main resin, EBECRYL 8604 offers excellent reactivity combined with good hardness and toughness. As a co-resin, EBECRYL 8604 blended with higher functional (penta or greater) oligomer(s) improves reactivity and weatherability while increasing the ductility with minimum impact surface hardness. Films of EBECRYL 8604 cured by ultraviolet light (UV) or electron beam (EB) combine abrasion resistance, hardness, and excellent exterior durability.

## PERFORMANCE HIGHLIGHTS

EBECRYL 8604 is characterized by:

- Light color
- Low odor

UV/EB cured products containing EBECRYL 8604 are characterized by the following performance properties:

- Excellent reactivity
- Excellent exterior durability
- Good surface hardness
- Excellent abrasion resistance
- 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 photoinitiators.

## SUGGESTED APPLICATIONS

Formulated UV/EB curable products containing EBECRYL 8604 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 8604 is recommended for use in:

- Automotive OEM or Re-finish
- Exterior durable coatings
- Coatings for wood and plastic requiring excellent exterior durability
- Metal coatings
- Optical coatings
- Non-yellowing topcoats for wood
- Screen inks

## SPECIFICATIONS

	VALUE
Appearance	Clear liquid

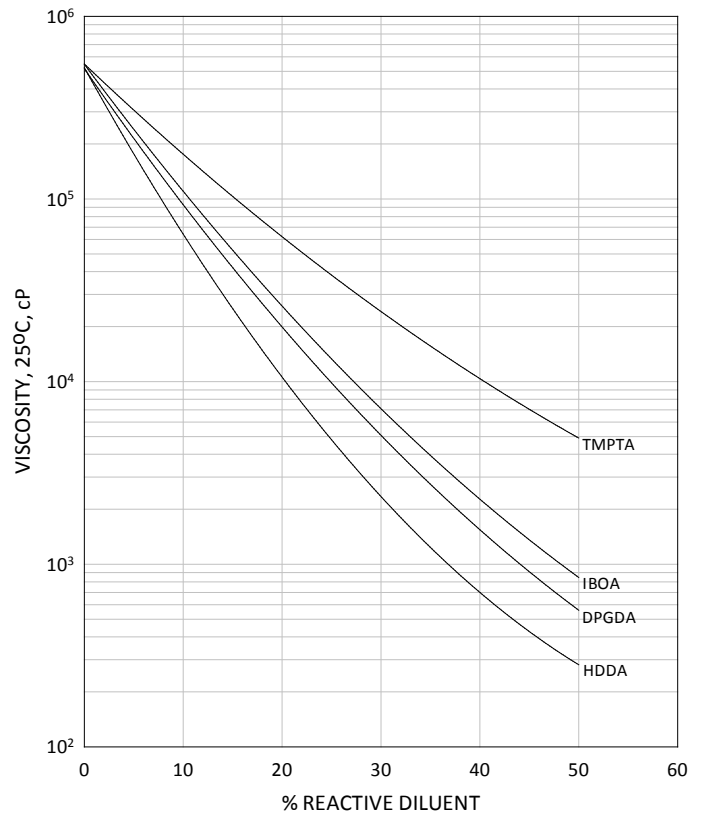
## TYPICAL PHYSICAL PROPERTIES

Color, Gardner scale	<2
Density, g/ml at 25°C	1.13
Functionality, theoretical <sup>(2)</sup>	4
NCO, %	<0.2
Viscosity, 60°C, cP/mPa·s	5000–8000

## TYPICAL CURED PROPERTIES<sup>(3)</sup>

Tensile strength, psi (MPa)	10000 (69)
Elongation at break, %	4.5
Young's modulus, psi (MPa)	350000 (2400)
Glass transition temperature, °C <sup>(4)</sup>	79
Refractive index, liquid, n <sub>D</sub> at 20°C	1.5108

## GRAPH I

**EBECRYL 8604 - VISCOSITY REDUCTION WITH REACTIVE DILUENTS**

(1) Product of allnex

(2) Theoretical determination based on the undiluted oligomer.

(3) UV cured 125 μ thick films.

(4) Determined by Dynamic Mechanical Analysis.

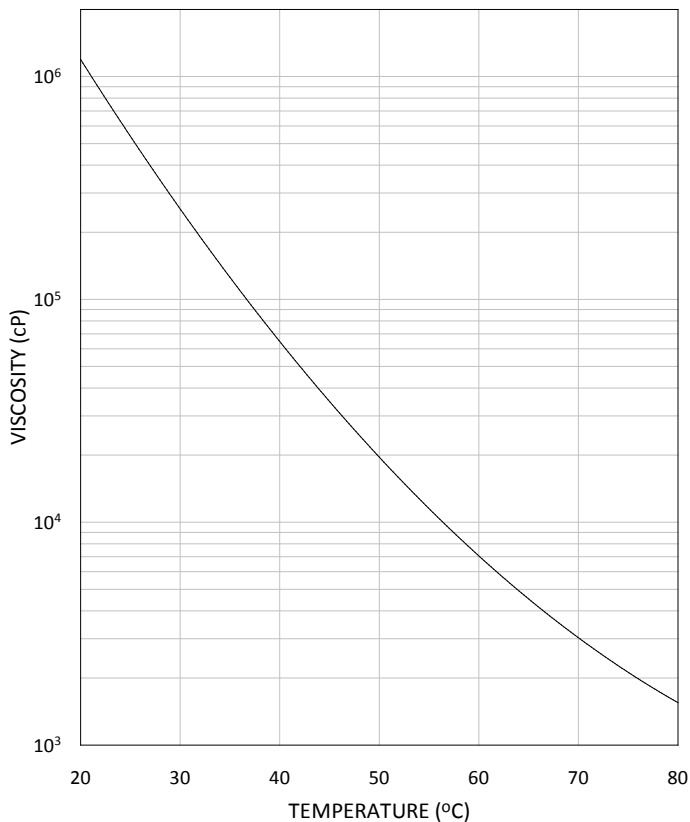
## VISCOSITY REDUCTION

Graph I shows the viscosity reduction of EBECRYL 8604 with 1,6-hexanediol diacrylate (HDDA), isobornyl acrylate (IBOA)<sup>(1)</sup>, neopentyl glycol propoxylate diacrylate (NPG(PO)<sub>2</sub>DA)<sup>(1)</sup>, trimethylolpropane triacrylate (TMPTA)<sup>(1)</sup> and tripropylene glycol diacrylate (TPGDA)<sup>(1)</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.

Graph II illustrates the change in viscosity of EBECRYL 8604 with increasing temperature.

## GRAPH II

### EBECRYL 8604 - VISCOSITY VS. TEMPERATURE



(1) Product of allnex

[www.allnex.com](http://www.allnex.com)

Disclaimer: allnex Group companies ("allnex") decline any liability with respect to the use made by anyone of the information contained herein. The information contained herein represents allnex's best knowledge thereon without constituting any express or implied guarantee or warranty of any kind (including, but not limited to, regarding the accuracy, the completeness or relevance of the data set out herein). Nothing contained herein shall be construed as conferring any license or right under any patent or other intellectual property rights of allnex or of any third party. The information relating to the products is given for information purposes only. No guarantee or warranty is provided that the product and/or information is adapted for any specific use, performance or result and that product and/or information do not infringe any allnex and/or third party intellectual property rights. The user should perform his/her own tests to determine the suitability for a particular purpose. The final choice of use of a product and/or information as well as the investigation of any possible violation of intellectual property rights of allnex and/or third parties remains the sole responsibility of the user.

Notice: Trademarks indicated with ®, ™ or \* as well as the allnex name and logo are registered, unregistered or pending trademarks of Allnex IP s.à.r.l. or its directly or indirectly affiliated allnex Group companies.

## PRECAUTIONS

Before using EBECRYL 8604, 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 8604.

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