TECHNICAL DATASHEET

# EBECRYL® 893

## Modified Polyester Acrylate

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EBECRYL® UV/EB Energy Curable Resins

## INTRODUCTION

EBECRYL 893 is a modified polyester acrylate specifically developed for UV curable field applied concrete and vinyl composition tile (VCT) floor coatings. EBECRYL 893 provides resistance to yellowing upon cure and over its lifetime. The low viscosity of EBECRYL 893 also provides latitude to achieve low viscosity formulations, which are required for field applied applications. Concrete and VCT coatings based on EBECRYL 893 provide a good balance of properties such as cure speed, adhesion, hardness, and scratch resistance. Good chemical and solvent resistance and high gloss are also obtained with concrete and VCT coatings based on EBECRYL 893.

## PERFORMANCE HIGHLIGHTS

- Resistance to yellowing upon cure and over time
- Low viscosity
- Good cure response
- Good chemical and solvent resistance

The actual performance of UV/EB cured products also depends on the selection of other formulation components such as reactive diluents, additives and photoinitiators.

## SUGGESTED APPLICATIONS

EBECRYL 893 is recommended for use in UV curable field applied concrete and VCT coatings.

## SPF(1) FOR VCT

| VCT | % | PROPERTY/VALUE |
|---|---|---|
| EBECRYL 893 | 40-60 | Coating Performance |
| $NPG(PO)_2DA$(2) or EBECRYL 145(2) | 10-20 | Viscosity Reduction |
| DPGDA(2) | 25-35 | Viscosity Reduction |
| Photoinitiator(s) | 4-6 | General Purpose PI |
| Defoamer(s) & Deaerator(s) | 0.5-2 | Micro and Macro Foam |
| Flow & Leveling Agents | 0.5-2 | Flow & Leveling |
| Rheology Modifier | 0-1 | Adjust Rheology |
| - VISCOSITY | | ~75 cP @ 25°C |
| - COAT WEIGHT | | 1-3 mils (25-75 µm) |
| - CURE EXPOSURE | | 410 $mJ/cm^2$ |

## TYPICAL PROPERTIES

| | VALUE |
|---|---|
| Appearance | Clear liquid |
| Color, Gardner scale (max) | 3 |
| Density, g/ml at 25°C | 1.11 |
| Functionality, theoretical(3) | 3.5 |
| Oligomer, % by weight | 100 |
| Viscosity, 25°C, cP/mPa·s | 600 |

## TYPICAL CURED PROPERTIES(4)

| | |
|---|---|
| Tensile strength, psi (MPa) | 1422 (9.8) |
| Elongation at break, % | 2.7 |
| Young's modulus, psi (MPa) | 69355 (478) |

## PROPERTIES OF STARTING POINT FORMULATIONS

The starting point formulation is applied over sealed concrete or sealed VCT to provide improvements in aesthetics and/or adhesion. The sealer composition and the properties of the starting point formulations are shown in the following FEATURED PRODUCT SHEETS.

- "UCECOAT® Resins for UV Curable Sealers for VCT (Vinyl Composition Tile)"
- "EBECRYL 893 Resin for Field Applied UV Curable Concrete Floor Coatings"
- "EBECRYL 893 Resin for Field Applied UV Curable VCT Floor Coatings"

## RHEOLOGY MODIFICATIONS

In some applications, a more thixotropic coating is required. This can be achieved by adding typical rheology modifiers, such as BYK® 410(5) at 0.5-3.0 %, in combination with untreated silica, such as GASIL® EBN(6), AEROSIL® 380(7), or ACEMATT® TS-100(7) at 2-3%. Other rheology modifiers may also be used.

## SPF FOR CONCRETE CLEAR COATINGS

| CONCRETE | % | PROPERTY/VALUE |
|---|---|---|
| EBECRYL 893 | 70-80 | Coating Performance |
| EBECRYL 160(2) or TMPEOTA(2) | 20-30 | Viscosity Reduction |
| Photoinitiator(s) | 3-8 | General Purpose PI |
| Defoamer(s) & Deaerator(s) | 0.2 | Micro & Macro Foam |
| Flow & Wetting Agent(s) | 0.5 | Flow & Wetting |
| Rheology Modifier | 0-1 | Adjust Rheology |
| - VISCOSITY | | ~400 cP @ 25°C |
| - COAT WEIGHT (1-2 coats) | | 6-7 mils (150-175 µm) |
| - CURE EXPOSURE | | |
| Partial/gel cure | | 390 $mJ/cm^2$ |
| Full cure | | 580 $mJ/cm^2$ |

*(1) Starting point formulation*
*(2) Product of allnex*
*(3) Theoretical determination based on the undiluted oligomer*
*(4) UV cured 160 µ thick films*
*(5) Product of BYK Additives & Instruments*
*(6) Product of Ineos Silicas*
*(7) Product of Evonik Tego Chemie GmbH*

## SPF FOR CONCRETE PIGMENTED COATINGS

| CONCRETE | % | PROPERTY/VALUE |
|---|---|---|
| EBECRYL 893 | 65-70 | Coating Performance |
| EBECRYL 160 (TMPEOTA) | 15-20 | Viscosity Reduction |
| Photoinitiator(s) | 3-8 | Surface & Through Cure |
| Amine Synergist(s) | 0-4 | Photoinitiator |
| Defoamer(s) & Deaerator(s) | 0.4-2 | Micro & Macro Foam |
| Black Pigment | 0.25-5 | Defoamer |
| White Pigment Paste* | 5-10 | Pigment |
| Flow & Leveling Agent(s) | 0.5-1 | Flow & Leveling |
| Rheology Modifier | 0-1 | Adjust Rheology |
| - VISCOSITY | | ~400 cP @ 25°C |
| - COAT WEIGHT (2 coats) | | 4-6 mils (100-150 µm) |
| - CURE EXPOSURE | | |
| Partial/gel cure | | 580 mJ/cm$^2$ |
| Full cure | | 830 mJ/cm$^2$ |

*White Pigment Paste: 29.5% DPGDA/ 3% EBECRYL 330/ 67.5% $TiO_2$

## PRECAUTIONS

Before using EBECRYL 893, 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 893.

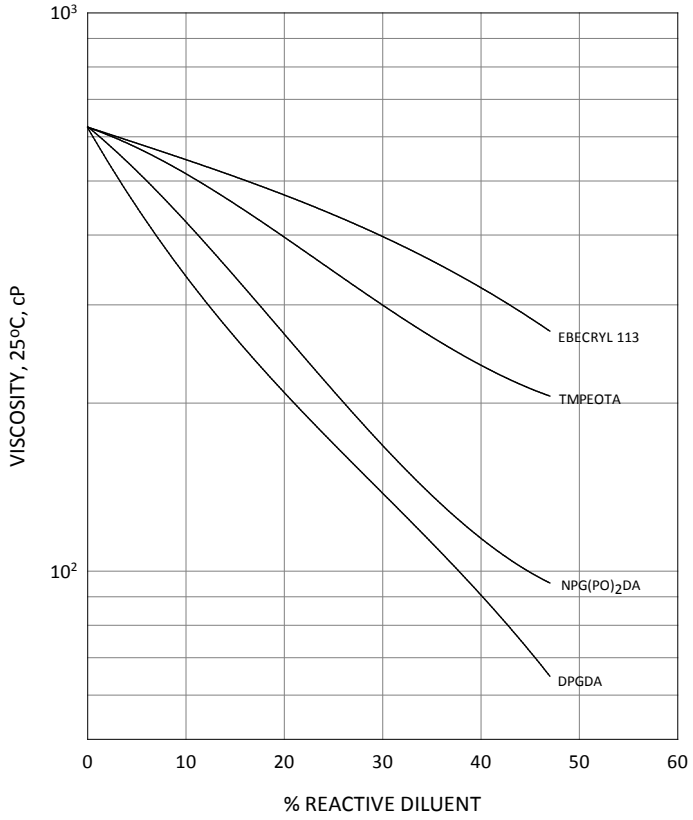
Please refer to the allnex Guide to Safety and Handling of Acrylate Oligomers and Monomers for additional information on the safe handling of acrylates.

## VISCOSITY REDUCTION

Graph I shows the viscosity reduction of EBECRYL 893 with several of the recommended diluents for concrete and VCT coatings: dipropylene glycol diacrylate (DPGDA), propoxylated neopentyl glycol diacrylate (NPG(PO)$_2$DA), ethoxylated trimethylolpropane triacrylate (TMPEOTA), and EBECRYL 113. 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 I

**EBECRYL 893 - VISCOSITY REDUCTION WITH REACTIVE DILUENTS**

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