

Hydroxy Functional Aliphatic
Acrylic Acrylate

INTRODUCTION

EBECRYL® 4900 is an Sn-free hydroxyl functional aliphatic urethane acrylate oligomer diluted in 40 % butyl acetate. EBECRYL® 4900 is ideal for applications that can utilize a thermal reaction (NCO/OH) followed by UV energy cure (dual cure). When EBECRYL® 4900 is combined with NCO functional compounds, such as EBECRYL® 4950, a tack-free surface is created that can be thermoformed to a variety of shapes and draws due to >250% elongation prior to UV cure. After UV cure, the coating demonstrates excellent stain and chemical resistance combined with high hardness and abrasion resistance.

PERFORMANCE DATA

EBECRYL® 4900 is characterized by:

- Light color
- Low viscosity
- Tack free after solvent evaporation

UV/EB cured formulations based on EBECRYL® 4900 are characterized by:

- High hardness
- Excellent cure response

VISCOSITY REDUCTION

EBECRYL® 4900 can be thinned with standard reactive diluents (mono-, di-, tri-, or higher functional acrylic acid esters) as well as with solvents. Suitable solvents are esters, ketones and aromatic hydrocarbons such as ethyl acetate, butyl acetate, methoxypropyl acetate, acetone, methyl ethyl ketone, methyl isobutyl ketone, xylene and mixtures thereof. Compatibility with the listed solvents is generally good but the storage stability of the respective solutions should be tested. In the case of dual-cure systems, only PU grade solvents should be used (max. 0.05 % water).

SUGGESTED APPLICATIONS

EBECRYL® 4900 can be combined with NCO-bearing resins for the formulation of UV coatings cured by the dual-cure process (UV-induced polymerization and NCO/OH reaction). After flash-off, UV cure and/or thermal cure may occur sequentially or concurrently. Either the UV cure or thermal cure may occur first. Coatings first subjected to UV curing followed by a thermal curing typically may be used for coating 3D parts. Alternatively, coating that are first thermally crosslinked and further downstream cured with UV allows intermediate processing of the coated articles as used in thermoforming applications.

Deep draw thermoforming coatings can be obtained in combination with the NCO functional binder EBECRYL® 4950.

TYPICAL PHYSICAL PROPERTIES

Color, Gardner	max. 1.0
Density, g/cm³ at 20°C	1.05
Hydroxyl value, mg KOH/g	~28
Resin solids, % by weight	60
Butyl acetate, % by weight	40
Viscosity, 25°C, mPa.s	~1500

THERMOFORMABLE DUAL CURE FORMULATION

Thermoformable starting point formulation of a SB UV 2K system using EBECRYL® 4900 combined with multi-functional isocyanate EBECRYL® 4950.

PART 1	
Component	%
EBECRYL® 4900	66.20
Butyl acetate	8.20
MODAFLOW® 9200 ⁽¹⁾	0.58
ESACURE ONE1 ⁽²⁾	3.30
DBTL ⁽³⁾ (catalyst)	0.02
PART 2	
EBECRYL® 4950	15.90
Butyl acetate	5.80

Mix Part 1 and 2 just prior to application. After thermal curing⁽⁴⁾, coatings based on the formulation show:

- Excellent thermoformability; > 250 %
- High storage stability
- Good blocking resistance

After subsequent UV curing⁽⁵⁾:

- Outstanding chemical- and stain resistance
- Excellent suntan and hand cream resistance
- Good abrasion and scratch resistance
- Flow and leveling aid, product of allnex
- Photoinitiator; product of IGM
- Dibutyl Tin Dilaurate
- 30' at 80°C and 1 w storage at RT
- 2 x 5 m/min with 120 W/cm Hg lamp

⁽¹⁾ Flow and leveling aid, product of allnex

⁽²⁾ Photoinitiator; product of IGM

⁽³⁾ Dibutyl Tin Dilaurate

⁽⁴⁾ 30' at 80°C and 1 w storage at RT

⁽⁵⁾ 2 x 5 m/min with 120 W/cm Hg lamp

PRECAUTIONS

Before using EBECRYL® 4900, 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.

EBECRYL® 4900 contains a flammable or combustible liquid and vapor. Consult the SDS for additional storage and handling recommendations.

See the SDS for the recommended storage temperature range for EBECRYL® 4900.