

ALIPHATIC URETHANE ACRYLATE

INTRODUCTION

EBECRYL® 4587 is a solvent-free, water emulsifiable aliphatic urethane acrylate, for use in ultraviolet (UV) and electron beam (EB) curable coatings.

PERFORMANCE DATA

Coatings based on EBECRYL® 4587 are characterized by high gloss, scratch resistance and resistance to water, alcohol, solvents and household chemicals. EBECRYL® 4587 allows to formulate UV-curable waterborne coatings free of reactive thinners, solvents and amines, as clear or pigmented systems as well as with glossy or mat finishes.

SUGGESTED APPLICATIONS

EBECRYL® 4587 yields hard films with good sandability, brilliance, good mechanical and chemical resistances and a high degree of yellowing resistance. For flexibilization, a combination of EBECRYL® 4587 and EBECRYL® 4100 in a 8/2 ratio is recommended.

SPECIFICATIONS

Viscosity at 23°C, mPa.s	approx. 1500
Iodine color value	approx. 1
Acid number, mg KOH/g	approx. 5

TYPICAL PROPERTIES

Density at 20°C, g/cm³	approx. 1.2
Hydroxyl content, %	approx. 1
Flash point, °C	> 100
Non-volatile content, %	approx 100

SOLUBILITY

Water	Partly soluble
Alcohols	Partly soluble
Ketone	Soluble
Esters	Soluble
Aliphatic hydrocarbons	Partly soluble

SUGGESTED FORMULATIONS

EBECRYL® 4587 can be easily emulsified in water. After the water has been flashed off, EBECRYL® 4587 exhibits (with 3% photoinitiator) a UV-reactivity of approximately 7 m/min. under a 80 W/cm Hg Lamp.

General guidelines for emulsifying EBECRYL® 4587 are as follows: take 70 parts resin and slowly stir in 30 parts tap water. Emulsify in a dissolver for approximately 2 minutes at high speed (peripheral speed of the stirring disk: 20 m/s). The remaining waterborne components of the formulation are added at reduced speed. Storage stability must be tested prior to use as this varies in accordance with the formulation used, in particular with the addition of dispersions. Due to EBECRYL® 4587 emulsions being acidic, compatibility with other components has to be checked. Experience has shown that neutralization with amine/ammonia negatively impacts storage stability.

If the coating can be applied immediately, the water can be added and stirred directly on site. The maximum water concentration is approximately 20 %, which can be increased by the addition of 1 to 2 % ethanol or acetone.

Non-waterborne additives must be dispersed in EBECRYL® 4587 prior to emulsification. Depending on the pigment concentration, the pigmented coating should either be dispersed in pure resin or dispersed in a dissolver using a previously produced stock emulsion (approximately 75 %). If dispersed in the resin, the mill base must be cooled to approximately +35°C prior to emulsification.

Air bubbles produced during formulation can be removed by sieving the coating, this prevents water from setting on the surface.

Acematt™ TS100, Acematt™ OK 412 and Deuteron™ MK have proven effective as matting agents, these should be added to the resin prior to the emulsification. Coalescing agents should not be used as they can cause cracking.

An EBECRYL® 4587 coating can be applied in high solids formulations using conventional application methods such as spraying, rolling and casting. The maximum coating weight should not exceed 100 g/m², otherwise it cannot be guaranteed that the water will flash off completely before UV curing.

Liquid photo-initiators are required for UV curing, these are added to the resin prior to emulsification. The water must be completely flashed off prior to radiation curing.

Esacure™ KIP 100F was shown to be an efficient initiator for clearcoats. For pigmented coatings, we recommend trying Esacure™ KTO46. These pigmented coatings must be cured using high-pressure gallium-doped mercury vapor lamps that emit in the long wave spectrum.

Formulation equipment and tools can be cleaned in a 95:5 water/acetone solution.

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Deuteron™ is a registered trademark from Deuteron GmbH.

Esacure™ is a registered trademark from Lamberti.

STORAGE AND HANDLING

Storage in original sealed allnex containers.

Recommended storage temperature : - 10 to + 35°C

Protect from intense radiation (light, UV), heat and foreign material.

allnex guarantees that for a period of 24 months following the day of manufacturing, the product will meet the specifications or values set forth in section "Specifications" or "Typical properties" above, whatever is applicable, provided that the product is stored in full compliance with the storage conditions set forth in and referenced under section "storage" above and is otherwise handled appropriately.

The lapse of the 24 months period does not necessarily mean that the product no longer meets specifications or the set values. However, prior to using said product, allnex recommend to test such a product if it still meets the specifications or the set values. allnex does not make any guarantees regarding the product after the lapse of the 24 months period and allnex shall not be responsible or liable in any way for the product failing to meet specifications or the set values after the lapse of the 24 months period.

STATUTORY LABELING

For Statutory Labeling information, please refer to the Safety Data Sheet.