

MERCAPTO MODIFIED RESIN

INTRODUCTION

EBECRYL® LED 02, a mercapto modified polyester acrylate resin, can be added as a co-resin to UV curable formulations. EBECRYL® LED 02 transforms formulations into UV LED, UVA, or low energy curable systems by providing better surface cure. In addition, this co-resin can also be used to obtain better surface cure in high energy cure formulations. EBECRYL® LED 02 provides better surface cure by mitigating oxygen inhibition of the free radical process.

PERFORMANCE DATA

EBECRYL® LED 02 is used as co-resin to increase the surface cure of formulations that are cured with UV LED, UVA or low energy lamps. A typical starting point formulation (C) is given below. Formulation A, which contains no materials to mitigate oxygen inhibition, remains tacky under all of the cure conditions. Formulation B contains EBECRYL 8811, which can provide better surface cure via its polyether structure. This is evident only when cured 120 seconds with UVA lamps. Formulation C contains EBECRYL® LED 02 and EBECRYL® 8811, and cures completely under all of the shown low energy cure conditions.

	A	B	C
EBECRYL® 1291 (6f urethane acrylate)	10	10	10
EBECRYL® 8811 (2f urethane acrylate)		40	40
EBECRYL® 1271 (2f urethane acrylate)	40		
EBECRYL® 853 (3f diluting acrylate)	50	50	25
EBECRYL® LED 02 (mercapto modified resin)			25
ESACURE® TPO (photoinitiator)	5	5	5
CURE CONDITIONS			
LED (395 nm) @ 5 m/min	>5 passes	>5 passes	1 pass
UVA 30"	NOK	NOK	OK
UVA 60"	NOK	NOK	OK
UVA 120"	NOK	OK	OK

Details of cure conditions:

	UVA	UVB	UVC	UVV
LED 5 m/min	126 mJ/cm ²	0	1 mJ/cm ²	988 mJ/cm ²
UVA 30"	394 mJ/cm ²	0	0	0
UVA 60"	775 mJ/cm ²	0	0	0
UVA 120"	1604 mJ/cm ²	0	0	0

The reactivity can further be influenced by:

- Level of EBECRYL® LED 02
- Type and functionality of the oligomer(s)
- Monomer dilution
- Coating thickness and viscosity
- UV LED or UVA dose and distance to substrate

Phosphine oxides such as TPO, and mono and bis acyl phosphine oxides, such as MAPO and BAPO are recommended photoinitiator types for UV LED and UVA curing.

SUGGESTED APPLICATIONS

EBECRYL® LED 02 has been developed for UV LED applications, but is equally suitable for UVA and other low energy curing applications. It can also provide better surface cure in typical, high energy curing applications that use standard medium pressure mercury lamps.

PHYSICAL DATA

EBECRYL® LED 02 is characterized by:

- Transparent liquid appearance
- Dynamic Viscosity, 25°C, mPa.s: 60 - 350 (DIN EN ISO 321920)
- Density: 1.17 g/cm³

COMPATIBILITY

EBECRYL® LED 02 is compatible with a broad range of selected resins of different chemical families, such as urethane acrylates, polyester acrylates, and epoxy acrylates. EBECRYL® LED 02 is also compatible with acidic additives such as adhesion promoters.

However, EBECRYL® LED 02 is not compatible with all resins, and this should be checked prior to use. Resins containing amines have a limited compatibility with EBECRYL® LED 02.

STORAGE AND HANDLING

Care should be taken not to expose radiation curable products to temperatures exceeding 30°C for prolonged periods or to direct sunlight. This might cause uncontrollable polymerization of the product with generation of heat.

Storage and handling should be in stainless steel, amber glass, amber polyethylene or baked phenolic lined containers. Do not store this material under an oxygen free atmosphere.

Use dry air to displace material removed from the container. This material should not be stored for more than 6 months

PRECAUTION

The following is a summary of the precautions to be taken when handling this product. Please refer to the Safety Data Sheet for further details.

The toxicological properties of this material have not been fully determined. Products of this type can be expected to be eye and skin irritant and have the potential to cause sensitization or other allergic responses. Appropriate precautions should be taken to avoid eye and skin contact and to avoid inhalation of the aerosols or vapours. Consult the relevant Safety Data Sheet for appropriate handling procedures and protective equipment prior to using this or any other material referred to in this bulletin.

See Safety Data Sheet for emergency and first aid procedures.