

EBECRYL® 571 Diluted Polyester Oligomer

Introduction

EBECRYL® 571 is specially developed for use in flexo printed shrink sleeve applications.

EBECRYL 571 is a modified polyester resin diluted with 40% of dipropylene glycol diacrylate (DPGDA) which exhibits good pigment wetting properties.

Performance Highlights

EBECRYL 571 is characterized by:

- Good pigment wetting

UV/EB cured formulations based on EBECRYL 571 are characterized by the following performance properties:

- Good adhesion on plastics: PVC, PET-G, OPS
- High flexibility
- Good printability
- Excellent wrinkle resistance

The actual properties of UV/EB cured formulations also depend on the selection of the other formulation components, such as reactive diluent(s), additives and photo initiators.

Suggested Applications

UV/EB curable products containing EBECRYL 571 may be applied by different application methods like: flexographic, screen, gravure, direct or reverse roll, and curtain coating methods.

However, EBECRYL 571 is particularly recommended for use in: Flexographic inks and coatings for shrink sleeve applications.

Typical Values

Dynamic viscosity at 25°C, mPa.s	± 9000
Colour, Gardner	max. 3
Density, g/cm ³	1.14
Polymer solids, % by weight	60
DPGDA, % by weight	40

Typical Cured Properties

Tensile strength, MPa ⁽¹⁾	8
Tensile elongation, % ⁽¹⁾	20
Young Modulus, MPa ⁽¹⁾	551
T _g , °C (by DHTA- max tg δ)	44
Surface tension, dynes/cm	39
Refractive index @ 25°C	1.5069

⁽¹⁾ Measured on a 125µ UV cured film at 21°C

Viscosity Reduction

EBECRYL 571 can be further diluted with reactive monomers such as dipropylene glycol diacrylate (DPGDA), 1,6 hexanediol diacrylate (HDDA), tripropylene glycol diacrylate (TPGDA), trimethylolpropane triacrylate (TMPTA), EBECRYL 160 or EBECRYL 40. The specific reactive diluent(s) used will influence performance properties such as hardness and flexibility.

	% EBECRYL 571	% of Monomer	Viscosity (25°C, in mPa.s)
DPGDA	82	18	1150
HDDA	86	14	1150
TPGDA	82	18	1360
TMPTA	73	27	1980
EBECRYL 160	73	27	1450
EBECRYL 40	73	27	1910

DPGDA, HDDA, TPGDA, TMPTA, EBECRYL 160 and EBECRYL 40 are produced by Cytec Industries – Specialty Coatings Resins

Start Point Formulations – Coloured Inks

EBECRYL 571 is very effective in concentrations from 40 to 60 % in the final concentration.

Pigment paste	YELLOW	MAGENTA	CYAN	BLACK
EBECRYL 571	65	60	54.5	50
ADDITOL® S130	1	1	1	1
Pigment wetting additives	4	4	3.5	4
Pigment DGR	30			
Pigment 4BY		35		
Pigment GLO			40	
Pigment SB250				45

Pigments: Permanent Yellow DGR (Clariant)
Irgalite blue GLO (Ciba- BASF)
Sunbrite 219-0203 (4BY) (SUN)
Special black 250 (Degussa)

The ink letdown is prepared with DPGDA as diluting monomer. For high levels of shrinkage we recommend the use of diacrylate products as DPGDA, HDDA or TPGDA.

Depending on the requirements of the ink, other diluting acrylates can be used as well. See below black ink 2 as an example: partially replacing DPGDA with EBECRYL 40 results in higher reactivity and higher hardness, but at the cost of some loss in shrinkage properties.

Ink preparation	YELLOW	MAGENTA	CYAN	BLACK 1	BLACK 2
Pigment paste	47	47	40	40	40
EBECRYL 571 / DPGDA (82/18)	33	33	36	40	35
DPGDA	11.5	12	16	10	
EBECRYL 40					15
ADDITOL PBZ	3	3	3	3	3
ADDITOL EHA	4	4	4	5	5
Irgacure® 369	1.5	1.5	1.5	2	2

Pigment concentration	14 %	16 %	16 %	18 %	18 %
EBECRYL 571 concentration	58 %	55 %	51 %	53 %	49 %
Viscosity range (25°C, in mPa.s)	1500	1400	960	1250	1800
Optical density	1.64	1.42	1.91	2.10	2.01

Note: Formulations given here are based on pigment concentrations used on the market.

ADDITOL-products: Cytec Industries – Specialty Coatings Resins

Irgacure-products: Ciba-BASF

Start Point Formulation – White Ink

EBECRYL 571 can also be used in white ink for shrink sleeve applications.

Ink preparation	WHITE
EBECRYL 571 / DPGDA (75/25)	53
ADDITOL S130	1
Pigment wetting additives	1
Irgacure 819	5
TiO ₂	40

Pigment concentration	40 %
EBECRYL 571 concentration	40 %
Viscosity range (25°C, in mPa.s)	1500

Note:

A certain amount of slip additive (such as EBECRYL 350 and EBECRYL 1360) may be necessary in order to facilitate the shrink sleeve production process.

Slip additives were not used in the formulations provided above.

Start Point Formulation – Metallic Ink

The nature of EBECRYL 571 makes this resin suitable for metallic pigments.

Ink preparation	GOLD	SILVER
EBECRYL 571	29.5	34.5
DPGDA	30.0	35.0
ADDITOL S130	2.0	2.0
ADDITOL PBZ	3.0	3.0
ADDITOL EHA	4.0	4.0
Irgacure 369	1.5	1.5
Rich Gold C82	30.0	
Miral 80000A		20.0

Rich Gold C82 (Eckart)

Miral 80000A (AVL metal powders)

ADDITOL-products:

Cytec Industries – Specialty Coatings Resins

Irgacure-products: Ciba-BASF

Storage And Handling

Care should be taken not to expose radiation curable products to temperatures exceeding 40°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 2 years.

Precautions

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 irritants and have the potential to cause sensitization or other allergic responses. Appropriate precaution should be taken to avoid eye and skin contact and to avoid inhalation of aerosols or vapours containing this product. 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 procedure.

Statutory Labeling

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

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