

HIGH PERFORMANCE
LOW MIGRATION LED CURABLE DISPERSION FOR DIGITAL PRINTING

INTRODUCTION

UCECOAT® 2806 is a very low viscosity and high-performance radiation curable polyurethane dispersion suitable for indirect food contact applications. The product is solvent-free, tin-free, BPA-free and APEO-free. It is characterized by a low mean particle size associated with an excellent colloidal stability alone and in the presence of pigments. Its polymer composition was optimized for high reactivity and elevated curing density as well as low migration potential. It contains essentially oligomers and polymers having a molecular weight above 500 Daltons with acrylic double bond functionality equal or superior to 6. It is easily water-redispersible and tacky before cure and after water evaporation.

PERFORMANCE HIGHLIGHTS

The product has been developed as a high-end binder for water-based overprint varnishes and inks where very low viscosity and water redispersibility before cure are considered as a strong asset. The low grits content resulting from our production process ensures easy product filterability combined with a good colloidal stability. This product is very reactive upon radiation curing and can be used with low-energy ultraviolet light sources (LED lamp). The cured coating is hard and exhibits outstanding mechanical and chemical resistance in clear or pigmented application. Its regulatory compliance and low migration potential makes it particularly recommended for indirect food contact packaging or labeling markets.

SUGGESTED APPLICATIONS

It can be easily applied by flexography and gravure printing techniques, although it is also particularly recommended for digital printing applications. Alternatively, it can be applied by conventional spray, screen, curtain and immersion coating methods. It can be used to cover paper & paperboard, corrugated sheets as well as several plastic substrates.

- Overprint varnishes
- Flexographic inks
- Inkjet inks
- Coatings for plastics and wood
- Clear coating on PVC floorings

TYPICAL WET PROPERTIES

Appearance	translucent to white liquid
Solid content, %	33.5-36.5
Brookfield viscosity, 25°C, mPa.s	< 50
pH	6.5 – 7.5
Mean particle size, nm	< 100
Grits > 50 µm, mg/l	< 50
Minimum film formation temperature, °C	< 5
Stability 60°C, days	> 10

TYPICAL CURED PROPERTIES

Tensile strength, MPa	13.4
Elongation at break, %	0.7
Young's modulus, MPa	1930
Glass transition temperature, °C	100

TYPICAL COMPOSITION

Weight-average molecular weight (Daltons)	~2,000
Fraction of molecular weight below 500 Daltons (%)	<2

SUGGESTED STARTING POINT FORMULATION

The final properties of UV cured formulations specifically depend on the selection of formulation components such as additives and photo-initiators. A starting point formulation for an UV curable OPV is indicated below:

Component	%
UCECOAT® 2806	85
Water	12
Substrate wetting additive (e.g. TEGO® Wet 270*)	0.4
Rheology Modifier (e.g. ADDITOL® VXW 6360)	0.2
Photo Initiator (e.g. IRGACURE® BCPK**)	2.3

*Evonik Industries AG // ** BYK-Chemie GmbH

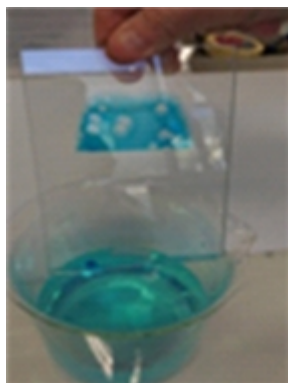
UCECOAT® 2806 can easily be blended with UCECOAT® 2804 to obtain a UV-curable coating with low migration potential and balanced overall properties (re-dispersability of physically dried formulation, adhesion, hardness, chemical- & outdoor resistance, etc.)

SELECTED PERFORMANCE DATA

The adhesion of the cured product on plastics is very good.

	Value
Polycarbonate	5
# 1 hour, cross- cut tape (1-5, 5 = perfect)	
Polyethylene (corona-treated)	5
# 1 hour, cross- cut tape (1-5, 5 = perfect)	
Polypropylene (corona-treated)	5
# 1 hour, cross- cut tape (1-5, 5 = perfect)	

The full re-dispersability of physically dried formulations based on UCECOAT® 2806 is a key asset when used in inkjet application to avoid clogging of the printhead nozzle.



Physical drying of ink in oven @80°C for 4 min on glass plate. Dip dried coating for 1 min in water at room temperature.

STORAGE AND HANDLING

This material should not be stored for more than 1 year. The recommended storage temperature range for UCECOAT® 2806 is 4°C to 40°C (39°F to 104°F). Due to the water content, the product needs to be stored above freezing temperature. Care should be taken not to expose the product to high temperature conditions, direct sunlight, acids, alkalis and salts. This might cause product destabilization and uncontrollable polymerization with generation of heat. Storage and handling should be in amber glass, amber polyethylene or baked phenolic lined containers. Do not store this material under an oxygen free atmosphere. Procedures that remove or displace oxygen from the material should be avoided and air is thus recommended to remove material from the container.

PRECAUTION

Before using UCECOAT® 2806, please read the Safety Data Sheet for additional information on product safety and handling procedures, as well as recommended personal protective equipment.

The toxicological properties of this material have not been fully determined. Appropriate precautions should be taken to avoid eye and skin contact and to prevent inhalation of the aerosols or vapours. Direct contact with this material may cause skin and eye irritation. Wash thoroughly after handling. Keep container tightly closed. Use with adequate ventilation. Consult Safety Data Sheet for emergency and first aid procedures.

STATUTORY LABELING

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