

HIGH PERFORMANCE
NON IRRITANT DISPERSION FOR DIGITAL PRINTING

INTRODUCTION

UCECOAT® 2805 is a low-viscous 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 also non-irritant for skin and eyes. It is characterized by an extremely low mean particle size associated with a low viscosity and an outstanding colloidal stability alone or in the presence of pigments. It is tack-free and water-redispersible before cure and after water evaporation. Its polymer composition was optimized for good coating performance and low migration potential after cure.

PERFORMANCE HIGHLIGHTS

The product has been developed as a high end binder for water-based overprint varnishes and inks where low viscosity and water re-dispersibility before cure are considered as a strong asset. The low grits content resulting from our production process ensures easy product filterability combined with an outstanding colloidal stability obtained in association with ultra-low mean particle size. This product has a good reactivity upon radiation curing and can be used with electron-beam. The cured coating is hard and exhibits good mechanical and chemical resistance with clear or pigmented formulations. Its regulatory compliance and low migration potential makes it particularly recommended for indirect food contact packaging or labeling markets while offering favourable occupational health & safety standards.

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	slightly translucent
Solid content, %	33.5-36.5
Brookfield viscosity, 25°C, mPa.s	< 200
pH	7.0 – 9.0
Mean particle size, nm	< 50
Grits > 50 µm, mg/l	< 10
Minimum film formation temperature, °C	< 10
Stability 60°C, days	> 10

TYPICAL CURED PROPERTIES

Tensile strength, MPa	44.7
Elongation at break, %	9.5
Young's modulus, MPa	1440
Glass transition temperature, °C	156

TYPICAL COMPOSITION

Weight-average molecular weight (Daltons)	5000 – 7000
Fraction of molecular weight below 500 Daltons (%)	~5

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® 2805	85
Water	12
Substrate wetting additive (e.g. TEGO® Wet 270*)	0.45
Rheology Modifier (e.g. ADDITOL® VXXW6360)	0.25
Photo Initiator (e.g. IRGACURE® BCPK**)	2.3

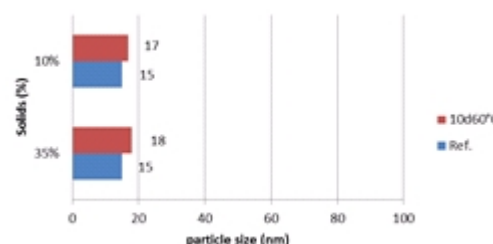
*Evonik Industries AG // ** BYK-Chemie GmbH

SELECTED PERFORMANCE DATA

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

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

Another key performance feature of UCECOAT® 2805 is related to the particle size in the dispersion and the stability thereof in accelerated stability tests. In below figure, the very good particle size – and hence viscosity – stability is demonstrated.



Particle size stability of UCECOAT® 2805 when submitted to accelerated ageing tests at 60°C in normal and diluted form

This very good stability of the UV-PUD is also reflected back in the stability of Waterborne UV inkjet inks (based on starting point formulation), where a very good viscosity stability is observed and no sedimentation is seen for any of the investigated colors (CYMK) upon accelerated ageing tests similar to the one shown above for the pure UV-PUD.

STORAGE AND HANDLING

This material should not be stored for more than 1 year.

The recommended storage temperature range for UCECOAT® 2805 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 stainless steel, 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.

PRECAUTIONS

Before using UCECOAT® 2805, 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.