ALBERDINGK BOLEY

Technology Information

Dispersions for Printing & Packaging

ALBERDINGK BOLEY

Content

Alberdingk Boley GmbH | Düsseldorfer Str. 53 | 47829 Krefeld | Germany
Phone +49 2151 528-0 | Fax+49 2151 573643 | info@alberdingk-boley.de | www.alberdingk-boley.de

Alberdingk Boley, Inc. | Greensboro, NC| USA | www.alberdingkusa.com
Alberdingk Resins (Shenzhen) Co., Ltd. | Shenzhen | P. R. China | www.alberdingkchina.com

ALBERDINGK BOLEY in a nutshell

 Leading international manufacturer of environmentally friendly water-based binders and oils with unique properties to refine, refurbish, bind and protect multiple types of substrates	 Medium sized, privately owned company > 250 million Euro group turnover in 2021 > a partner to our customers for 250 years	 > 500 employees
 Dynamic, Innovative and flexible Pioneers in biobased polymer dispersions	 Dispersions: Acrylic, Vinyl acetate, Polyurethane and hybrid dispersions Oils: Linseed oil, Castor oil, Derivatives	 Locations: • Krefeld, Germany • Kerpen, Germany • Leuna, Germany • Treviso, Italy • Greensboro, USA • Shenzhen, China • Zhuhai, China

For more information about ALBERDINGK BOLEY and our product offerings, visit www.alberdingk-boley.de.

Alberdingk Boley GmbH | Düsseldorfer Str. 53 | 47829 Krefeld | Germany
Phone +49 2151 528-0 | Fax+49 2151 573643 | info@alberdingk-boley.de | www.alberdingk-boley.de

Alberdingk Boley, Inc. | Greensboro, NC| USA | www.alberdingkusa.com
Alberdingk Resins (Shenzhen) Co., Ltd. | Shenzhen | P. R. China | www.alberdingkchina.com

Introduction

For some years, we have been working closely together with various manufacturers from the packaging market. Gradually we became more and more aware of what our unique binders can cover for those industries. Our waterbased acrylate, styrene acrylate and polyurethane dispersions help our customers achieve their difficult performance targets and stay one step ahead of the competition. Our customers observe that with the right choice of binder, the water vapour barrier, oxygen barrier, chemical resistance, velvet touch, paper touch or anti-slip effect can be achieved. This is why the major manufacturers of liquid inks, paper coatings, film coatings and overprint varnishes rely on our knowledge of aqueous polymer dispersions acquired over many years.

Products for film coatings

Acrylic dispersions

Alberdingk®-acrylic emulsion	MFFT (°C)	Food contact suitability	Main benefits
AC 2005	5	Direct	Adheres to a vast variety of plastics. Excellent re-coatability
AC 2508	80	Direct possible	Very high Tg, used as additive or for extremely rigid, alcohol and plasticizer resistant coatings
AC 25381	9	Indirect	Economic resin for BOPP primer with good blocking resistance and excellent water resistance
AC 2575	25	Direct possible	Alkaline soluble acrylic for pigment grinds and flexible OVP's
AC 3600	0	Indirect	Clear in the can resin with very good chemical and weathering resistance for different film surfaces
AC 3650	38	Direct possible	Fast drying, clear in the can resin with very good chemical and grease resistance

Alberdingk Boley GmbH | Düsseldorfer Str. 53 | 47829 Krefeld | Germany
Phone +49 2151 528-0 | Fax+49 2151 573643 | info@alberdingk-boley.de | www.alberdingk-boley.de

Alberdingk Boley, Inc. | Greensboro, NC| USA | www.alberdingkusa.com
Alberdingk Resins (Shenzhen) Co., Ltd. | Shenzhen | P. R. China | www.alberdingkchina.com

Alberdingk®-acrylic emulsion	MFFT (°C)	Food contact suitability	Main benefits
AC 3660	55	Direct possible	Very fast drying clear in the can resin with excellent chemical and grease/oil resistance
AC 4605	5	Direct	Superior barrier properties against water & moisture. Adheres to a vast variety of plastics. Excellent re-coatability
AC 4607	0	Direct	For barrier coatings with excellent water resistance, adheres to a vast variety of plastics
AC 4655	52	Direct	Co-resin for improved block resistance with possible use for food packaging
AC 5503	0	Possible for direct	The films are clear and block-free for laminating transparent foils without yellowing at high temperatures. The dispersion can be used pure or as additive for improved cohesion
Ren AC 5605	5	Direct	Biobased acrylic with superior barrier properties against water & moisture. Adheres to a vast variety of plastics. Excellent re-coatability

Alberdingk Boley GmbH | Düsseldorfer Str. 53 | 47829 Krefeld | Germany
Phone +49 2151 528-0 | Fax+49 2151 573643 | info@alberdingk-boley.de | www.alberdingk-boley.de

Alberdingk Boley, Inc. | Greensboro, NC| USA | www.alberdingkusa.com
Alberdingk Resins (Shenzhen) Co., Ltd. | Shenzhen | P. R. China | www.alberdingkchina.com

Polyurethane dispersions

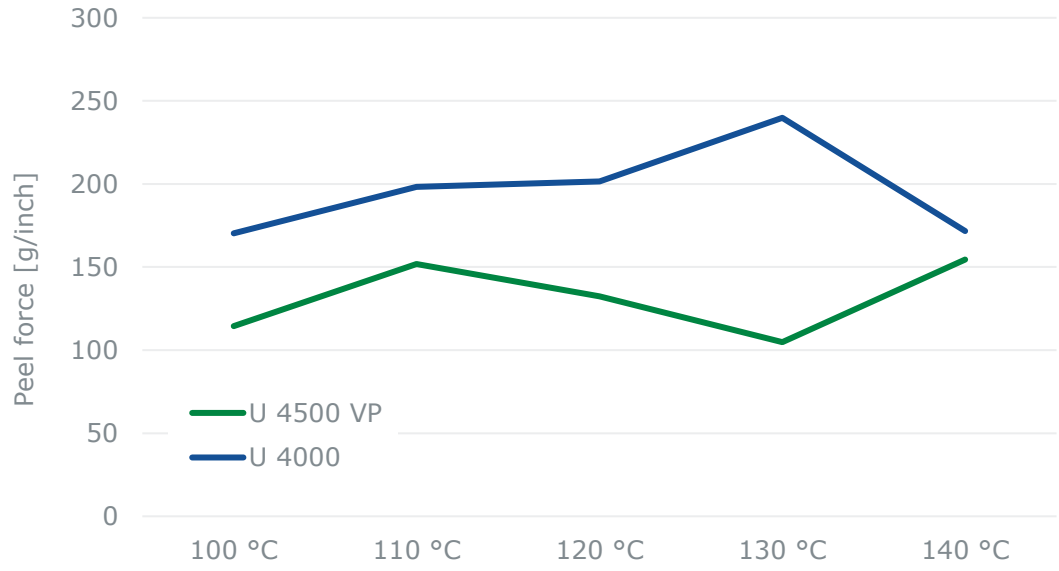
Alberdingk®-polyurethane dispersion	MFFT (°C)	Food contact suitability	Main benefits
AFU 4200	0	Indirect	Primer for BOPP and other plastics, amine-free
U 205	0	Indirect	Hydrophilic coating with rubber-feel
U 475	0	Indirect	Excellent adhesion and water resistance
U 3200	0	Indirect	Very good adhesion, hydrolysis resistant
U 3251	0	Indirect	Excellent heat seal properties, broad adhesion
U 400 N	0	Indirect	Excellent heat seal properties, broad adhesion, hydrolysis resistant
U 4000	0	Indirect	Primer for BOPP and other plastics, excellent printability
U 4020	0	Indirect	Very good heat seal properties
U 4040	0	Indirect	Adhesion to EVA, very good heat seal properties
U 4101	0	Indirect	Slightly tacky, superior adhesion, hydrolysis resistant
U 4500	0	Indirect	Swiss Ordinance compliant BOPP primers
U 6100	0	Indirect	Harder PES-PUD for heat seal, broad adhesion
U 6150	0	Indirect	PC-PUD with very high gloss & adhesion

Alberdingk Boley GmbH | Düsseldorfer Str. 53 | 47829 Krefeld | Germany
Phone +49 2151 528-0 | Fax+49 2151 573643 | info@alberdingk-boley.de | www.alberdingk-boley.de

Alberdingk Boley, Inc. | Greensboro, NC| USA | www.alberdingkusa.com
Alberdingk Resins (Shenzhen) Co., Ltd. | Shenzhen | P. R. China | www.alberdingkchina.com

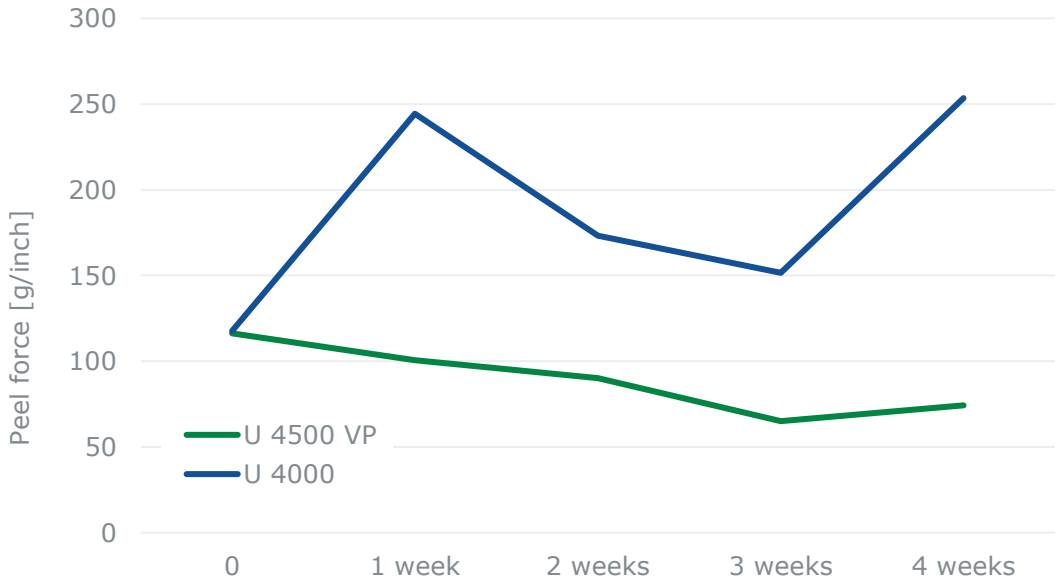
Heat Seal properties

PVdC coated BOPP film (coating weight: approx. 3 g/m² dry)
Primer: **Alberdingk® U 4000** vs. **Alberdingk® U 4500** (1s./150N)



Humidity Seal Retention

PVdC coated BOPP film film (coating weight: approx. 3 g/m² dry)
Primer:**Alberdingk® U 4000** vs. **Alberdingk® U 4500** (1s./150N/120°C); 38°C @90% rel. hum.



Alberdingk Boley GmbH | Düsseldorfer Str. 53 | 47829 Krefeld | Germany
Phone +49 2151 528-0 | Fax+49 2151 573643 | info@alberdingk-boley.de | www.alberdingk-boley.de

Alberdingk Boley, Inc. | Greensboro, NC| USA | www.alberdingkusa.com
Alberdingk Resins (Shenzhen) Co., Ltd. | Shenzhen | P. R. China | www.alberdingkchina.com

UV-curable dispersions

Alberdingk®-UV-curables	MFFT (°C)	Food contact suitability	Main benefits
LUX 250	0	Indirect (with restrictions)	Workhorse UV-PUD, can be washed with water before UV-cure
LUX 260	0	Indirect (with restrictions)	Low Mw UV-PUD, very high gloss, good re-wetting
LUX 515	0	Indirect (with restrictions)	Economic UV-acrylic with good re-emulsifiabilty before UV-cure

Film coating highlights

Alberdingk® Ren AC 5605

- Biobased product
- Unique acrylic with superior barrier properties against water & moisture.
- Fat resistant
- Excellent re-coatability

Alberdingk® U 4500

- Very good adhesion to different plastics, such as corona-treated BOPP
- Hydrazine-free
- Easy recoatability

Alberdingk Boley GmbH | Düsseldorfer Str. 53 | 47829 Krefeld | Germany
Phone +49 2151 528-0 | Fax+49 2151 573643 | info@alberdingk-boley.de | www.alberdingk-boley.de

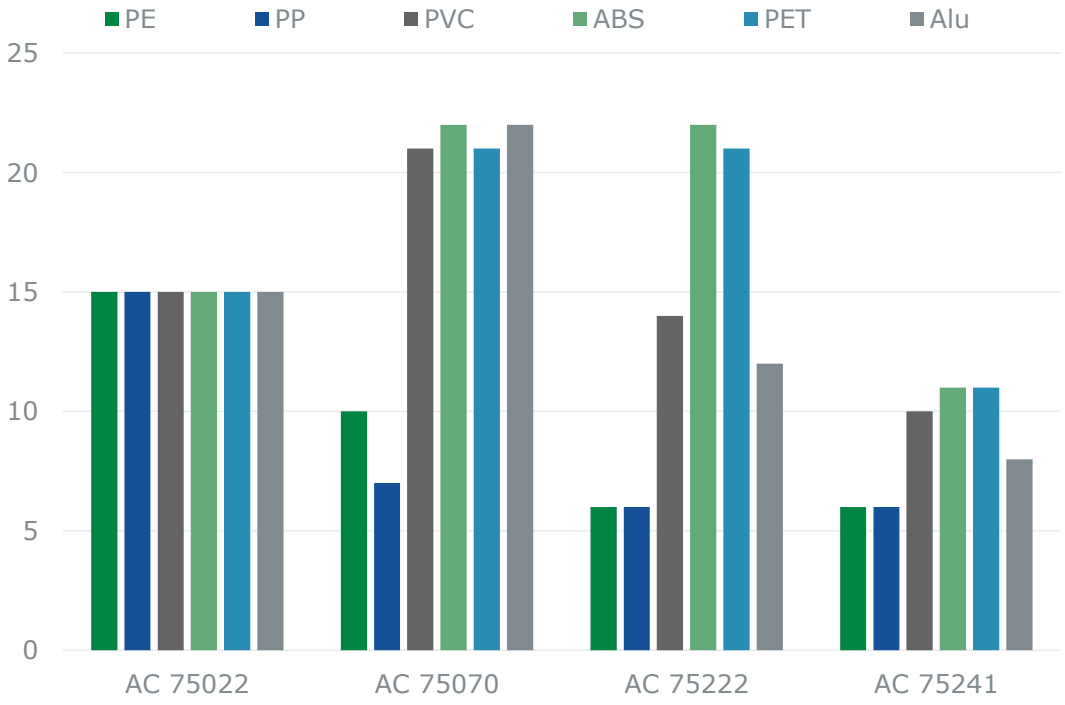
Alberdingk Boley, Inc. | Greensboro, NC| USA | www.alberdingkusa.com
Alberdingk Resins (Shenzhen) Co., Ltd. | Shenzhen | P. R. China | www.alberdingkchina.com

Pressure sensitive adhesives

Alberdingk®-adhesive dispersion	MFFT (°C)	Food contact suitability	Main benefits
AC 75022	0	Direct possible	High cohesion and heat resistance - the resin is suitable for self-adhesive articles e.g. labels, tapes and foils
AC 75070	0	Indirect	Good balance of adhesion and cohesion, high tack and high peel strength
AC 75222	0	Direct possible	High cohesion and heat resistance - suitable for producing adhesives for labels, sheets and tapes
AC 75241	0	Indirect	Excellent cohesion and heat resistance - suitable for double sided tapes, envelopes and automotive

Peel Strength on different substrates

FINAT Test Method FTM 1, Coating Weight: 30 g/m², dry



Alberdingk Boley GmbH | Düsseldorfer Str. 53 | 47829 Krefeld | Germany
Phone +49 2151 528-0 | Fax+49 2151 573643 | info@alberdingk-boley.de | www.alberdingk-boley.de

Alberdingk Boley, Inc. | Greensboro, NC| USA | www.alberdingkusa.com
Alberdingk Resins (Shenzhen) Co., Ltd. | Shenzhen | P. R. China | www.alberdingkchina.com

Products for paper coatings

Alberdingk®-Paper coatings	MFFT (°C)	Food contact suitability	Main benefits
PC 4007	0	Direct	Ready to use barrier coating on paper with excellent COBB and KIT values as well as good water vapour barrier
PC 4725	0	Direct	Ready to use barrier coating on paper with very low water vapour permeability, especially under tropical conditions as well as very good COBB and KIT values
AC 2005	5	Direct	Workhorse polymer for water & fat barrier
AC 4605	5	Direct	Same as AC 2005, but compliant to GB 9685-2016
AC 4655	52	Direct	GB 9685-2016 compliant additive to improve blocking resistance
Ren AC 5605	5	Direct	Biobased acrylic with superior barrier properties against water, moisture and fat. Excellent re-coatability

Paper coating highlights

Alberdingk® Ren AC 5605

- Biobased product
- Unique acrylic with superior barrier properties against water & moisture
- Fat resistant
- Excellent re-coatability

Alberdingk® PC 4725

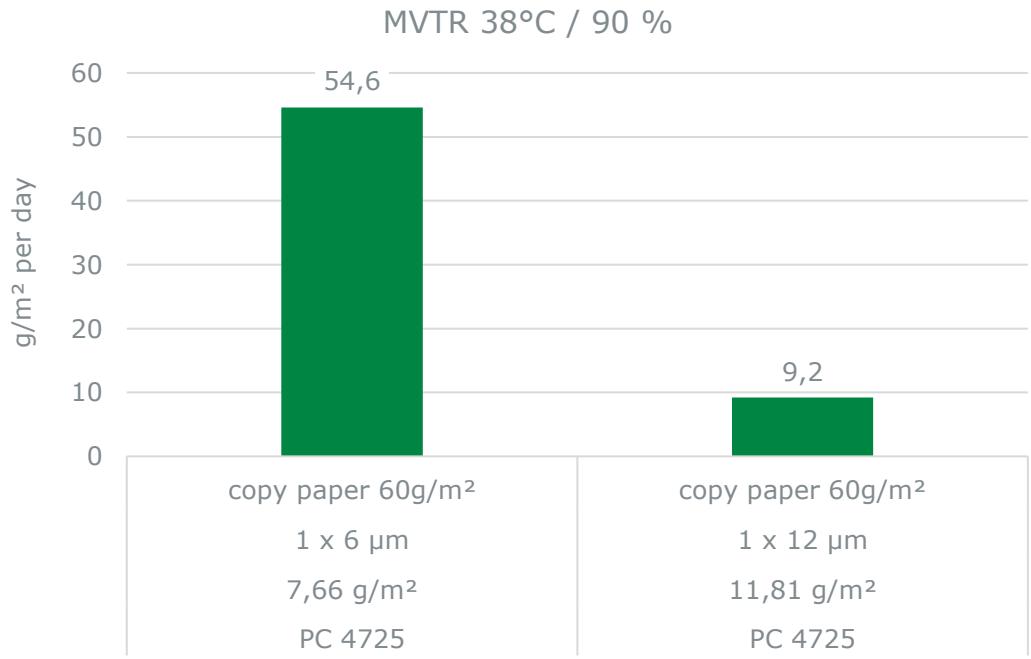
- Ready to use
- Excellent Cobb & KIT Values, superior water vapour barrier, especially under tropical conditions

Alberdingk Boley GmbH | Düsseldorfer Str. 53 | 47829 Krefeld | Germany
Phone +49 2151 528-0 | Fax+49 2151 573643 | info@alberdingk-boley.de | www.alberdingk-boley.de

Alberdingk Boley, Inc. | Greensboro, NC| USA | www.alberdingkusa.com
Alberdingk Resins (Shenzhen) Co., Ltd. | Shenzhen | P. R. China | www.alberdingkchina.com

Paper Coating performance

MVTR (Moisture Vapour Transmission Rate)
Uncoated copy paper vs. copy paper coated with **Alberdingk® PC 4725**



Cobb 1800 & KIT

Type	Film thickness	Substrate	Cobb1800 (Tappi T441)
Alberdingk® PC 4725	1 x 6µ	paper 60g/m²	6.4

Type	Film thickness	Substrate	KIT (Tappi T559)
Alberdingk® PC 4725	6µ	paper 60g/m²	12
	12µ	paper 60g/m²	12

Alberdingk Boley GmbH | Düsseldorfer Str. 53 | 47829 Krefeld | Germany
Phone +49 2151 528-0 | Fax+49 2151 573643 | info@alberdingk-boley.de | www.alberdingk-boley.de

Alberdingk Boley, Inc. | Greensboro, NC| USA | www.alberdingkusa.com
Alberdingk Resins (Shenzhen) Co., Ltd. | Shenzhen | P. R. China | www.alberdingkchina.com

Products for matt / haptic coatings

The PUR-MATT technology are innovative, inherent matt dispersions from Alberdingk Boley. PUR-MATT technology give your products a completely new look and feel.

ALBERDINGK® PUR-MATT offer soft touch, velvet- and paper feel or even the touch of sand paper - since haptic properties are subjective we invite you to talk to us.

The main difference between PUR-MATT products and standard PUDs is the particle size distribution and the morphology of the particles. While "conventional" PUDs show a monomodal and narrow particle size distribution, our PUR-MATT PUDs show an extremely multimodal, broad particle size distribution. The median particle size of a conventional PUD is in the range of 60-100nm, while the median particle size of our PUR-MATT PUDs is 4000nm or 4µm!

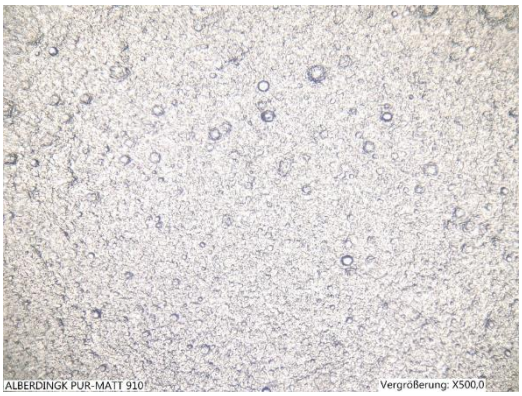
By controlling particle size, particle distribution and morphology, we can determine the degree of gloss reduction and other parameters such as haptic. Furthermore, by changing the refractive index of the polymer, we can achieve optical effects like "frost" or "etch" look.

Analysis of the surface structure show, that the film has a quite uniform "roughness". Individual particle size on the surface is in the range of 4 - 6µm. The shape of the particles could be described as "potato chips".

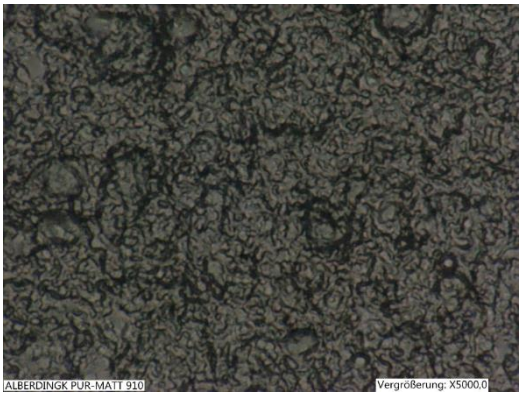
Even though the particles aren't too large and not too different size, they show a particularly efficient matting effect - this can be explained by the fact that the particles arrange themselves in "waves" during the film formation. This wave structure causes an additional matting effect.

Light microscopy of ALBERDINGK® PUR-MATT 970

500x magnification:



5000x magnification:



Alberdingk Boley GmbH | Düsseldorfer Str. 53 | 47829 Krefeld | Germany
Phone +49 2151 528-0 | Fax+49 2151 573643 | info@alberdingk-boley.de | www.alberdingk-boley.de

Alberdingk Boley, Inc. | Greensboro, NC| USA | www.alberdingkusa.com
Alberdingk Resins (Shenzhen) Co., Ltd. | Shenzhen | P. R. China | www.alberdingkchina.com

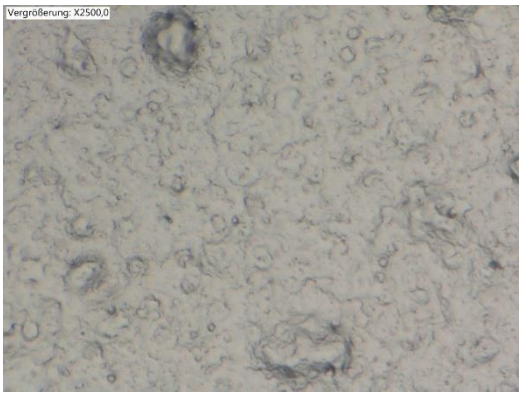
Alberdingk®-inherent matt polyurethane dispersion	MFFT (°C)	Food contact suitability	Main benefits
PUR-MATT 300	10	Indirect	Inherently matt softfeel film-surface
PUR-MATT 970	15	Indirect	Inherently matt paperfeel film-surface
PUR-MATT UV 29	10	Indirect	Soft, UV-curable PUD with inherently matt film-surface and high optical transparency on dark substrates
PUR-MATT 111	10	*Not yet determined*	Soft, PUD with inherently matt film-surface and high optical transparency on dark substrates

Matt / haptic coating highlights

Alberdingk® PUR-MATT Family

- Inherently matt film surface
- Softfeel haptic as well as paperfeel haptic possible
- No white scratch marks

Examples for different particle shapes (2500x magnification)



Alberdingk Boley GmbH | Düsseldorfer Str. 53 | 47829 Krefeld | Germany
Phone +49 2151 528-0 | Fax+49 2151 573643 | info@alberdingk-boley.de | www.alberdingk-boley.de

Alberdingk Boley, Inc. | Greensboro, NC| USA | www.alberdingkusa.com
Alberdingk Resins (Shenzhen) Co., Ltd. | Shenzhen | P. R. China | www.alberdingkchina.com

Biobased products for multiple coatings

Biomass balance vs. dedicated production with renewable resources

The biomass balance approach offers a convenient way to incorporate renewable materials in the process stream. Biomaterials are used to manufacture Bio-Naphta which is then used in "ordinary" chemical feedstock production.

The main advantage is that the final product remains unchanged despite the use of renewable resources. However, the final product may not even contain one renewable carbon atom since this is a statistical approach.

The supplier uses an equivalent of renewable raw material per purchased ton of bio mass balance product.

Since it's a statistical method as products made from biomass and crude oil are manufactured in the same plant, a certified process of surveillance with an independent 3rd party needs to be implemented.

Binder-producer and paint-manufacturer will need to be certified accordingly.

Learn more:

https://www.iscc-system.org/

https://www.tuv.com/world/en/iscc-international-sustainability-and-carbon-certification.html

ALBERDINGK BOLEY is currently preparing for an ISCC-certification.

Alberdingk Boley GmbH | Düsseldorfer Str. 53 | 47829 Krefeld | Germany
Phone +49 2151 528-0 | Fax+49 2151 573643 | info@alberdingk-boley.de | www.alberdingk-boley.de

Alberdingk Boley, Inc. | Greensboro, NC| USA | www.alberdingkusa.com
Alberdingk Resins (Shenzhen) Co., Ltd. | Shenzhen | P. R. China | www.alberdingkchina.com

Future product code nomenclature for renewable resource products:

CUR / LUR	Castor oil / linseed oil based polyurethane
OP	Oil polymer
ALBODUR®	Castor oil based polyol
Ren U	Polyurethane based on renewable resource (dedicated or Biomass-balance)
Ren AC	Acrylic based on renewable resource (dedicated or Biomass-balance)
Ren AS	Styrene acrylic based on renewable resource (dedicated or Biomass-balance)

Current / forthcoming biobased portfolio

Alberdingk®-Paper coatings	MFFT (°C)	Food contact suitability	Main benefits
Ren AC 5605	5	Direct	Biobased acrylic with superior barrier properties against water, moisture and fat. Excellent re-coatability
Ren AFU 4200	0	*Not yet determined*	Biobased primer for BOPP and other plastics, amine-free
Ren U 355	0	*Not yet determined*	For the production of 1k- and 2K-adhesives for heat seal applications, e.g. furniture foil lamination, shoe adhesives
Ren U 400	0	*Not yet determined*	Excellent heat seal properties, broad adhesion, hydrolysis resistant
Ren U 460	0	*Not yet determined*	For the production of 1k- and 2K-adhesives for heat seal applications, e.g. furniture foil lamination, shoe adhesives
Ren U 4000	0	*Not yet determined*	Biobased primer for BOPP and other plastics, excellent printability
Ren U 4040	0	*Not yet determined*	Adhesion to EVA, very good heat seal properties
Ren U 4101	0	*Not yet determined*	Slightly tacky, superior adhesion, hydrolysis resistant
Ren U 4500	0	*Not yet determined*	Swiss Ordinance compliant BOPP primers

Alberdingk Boley GmbH | Düsseldorfer Str. 53 | 47829 Krefeld | Germany
Phone +49 2151 528-0 | Fax+49 2151 573643 | info@alberdingk-boley.de | www.alberdingk-boley.de

Alberdingk Boley, Inc. | Greensboro, NC| USA | www.alberdingkusa.com
Alberdingk Resins (Shenzhen) Co., Ltd. | Shenzhen | P. R. China | www.alberdingkchina.com

Notes:

Alberdingk Boley GmbH | Düsseldorfer Str. 53 | 47829 Krefeld | Germany
Phone +49 2151 528-0 | Fax+49 2151 573643 | info@alberdingk-boley.de | www.alberdingk-boley.de

Alberdingk Boley, Inc. | Greensboro, NC| USA | www.alberdingkusa.com
Alberdingk Resins (Shenzhen) Co., Ltd. | Shenzhen | P. R. China | www.alberdingkchina.com

Notes:

Alberdingk Boley GmbH | Düsseldorfer Str. 53 | 47829 Krefeld | Germany
Phone +49 2151 528-0 | Fax+49 2151 573643 | info@alberdingk-boley.de | www.alberdingk-boley.de

Alberdingk Boley, Inc. | Greensboro, NC| USA | www.alberdingkusa.com
Alberdingk Resins (Shenzhen) Co., Ltd. | Shenzhen | P. R. China | www.alberdingkchina.com

Photos: pixabay.com

ALBERDINGK BOLEY

Alberdingk Boley GmbH
Düsseldorfer Str. 53 | 47829 Krefeld | Germany
Tel +49 2151 528-0 | Fax +49 2151 573643
info@alberdingk-boley.de | www.alberdingk-boley.de