



Dispersions for Printing & Packaging











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**ALBERDINGK BOLEY in a nutshell**

 <p>Leading international manufacturer of environmentally friendly water-based binders and oils with unique properties to refine, refurbish, bind and protect multiple types of substrates</p>	 <p>Medium sized, privately owned company</p> <p>&gt; a partner to our customers for more than 250 years</p>	 <p>&gt; 500 employees</p>
 <p>Dynamic, Innovative and flexible</p> <p>Pioneers in biobased polymer dispersions</p>	 <p>Dispersions: Acrylic, Vinyl acetate, Polyurethane and hybrid dispersions</p> <p>Oils: Linseed oil, Castor oil, Derivatives</p>	 <p>Locations:</p> <ul style="list-style-type: none"> <li>• Krefeld, Germany</li> <li>• Kerpen, Germany</li> <li>• Leuna, Germany</li> <li>• Treviso, Italy</li> <li>• Congleton, UK</li> <li>• Greensboro, USA</li> <li>• Shenzhen, China</li> <li>• Zhuhai, China</li> </ul>

For more information about ALBERDINGK BOLEY and our product offerings, visit [www.alberdingk-boley.de](http://www.alberdingk-boley.de).



## 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.

## Food Contact suitability

All products presented here are suitable for use in contact with food according to different regulations.

There may be restrictions regarding the use with certain foods or corresponding SML values. For details, please refer to the Regulatory Information Sheet (RIS) or contact our Team Regulatory Management team at [trm@alberdingk-boley.de](mailto:trm@alberdingk-boley.de).

## Products for film coatings

### Acrylic dispersions

Alberdingk®-acrylic emulsion	MFFT (°C)	Main benefits
<b>AC 2005</b>	5	Adheres to a vast variety of plastics. Excellent re-coatability
<b>AC 2508</b>	80	Very high Tg, used as additive or for extremely rigid, alcohol and plasticizer resistant coatings
<b>AC 25381</b>	9	Economic resin for BOPP primer with good blocking resistance and excellent water resistance
<b>AC 2575</b>	25	Alkaline soluble acrylic for pigment grinds and flexible OVP's



Alberdingk®-acrylic emulsion	MFFT (°C)	Main benefits
<b>AC 3600</b>	0	Clear in the can resin with very good chemical and weathering resistance for different film surfaces
<b>AC 3650</b>	38	Fast drying, clear in the can resin with very good chemical and grease resistance
<b>AC 3660</b>	55	Very fast drying clear in the can resin with excellent chemical and grease/oil resistance
<b>AC 4605</b>	5	Superior barrier properties against water & moisture. Adheres to a vast variety of plastics. Excellent re-coatability
<b>Ren AC 5605</b>	5	Biobased acrylic with superior barrier properties against water & moisture. Adheres to a vast variety of plastics. Excellent re-coatability
<b>AC 4607</b>	0	For barrier coatings with excellent water resistance, adheres to a vast variety of plastics
<b>AC 4655</b>	52	Co-resin for improved block resistance with possible use for food packaging
<b>AC 5503</b>	0	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





## Polyurethane dispersions

Alberdingk®-polyurethane dispersion	MFFT (°C)	Main benefits
<b>U 205</b>	0	Hydrophilic coating with rubber-feel
<b>U 355</b>	0	Superior adhesion to plastics, excellent hydrolysis resistance
<b>U 460</b>	0	Very high bond in 1K, excellent hydrolysis resistance
<b>U 475</b>	0	Excellent adhesion and water resistance
<b>U 3200</b>	0	Very good adhesion, hydrolysis resistant
<b>U 3251</b>	0	Excellent heat seal properties, broad adhesion
<b>U 400 N</b>	0	Excellent heat seal properties, broad adhesion, hydrolysis resistant
<b>U 4000</b>	0	Primer for BOPP and other plastics, excellent printability
<b>U 4023</b>	0	Very good heat seal properties
<b>U 4040</b>	0	Adhesion to EVA, very good heat seal properties
<b>U 4101</b>	0	Slightly tacky, superior adhesion, hydrolysis resistant
<b>U 6100</b>	0	Harder PES-PUD for heat seal, broad adhesion
<b>U 6150</b>	0	PC-PUD with very high gloss & adhesion

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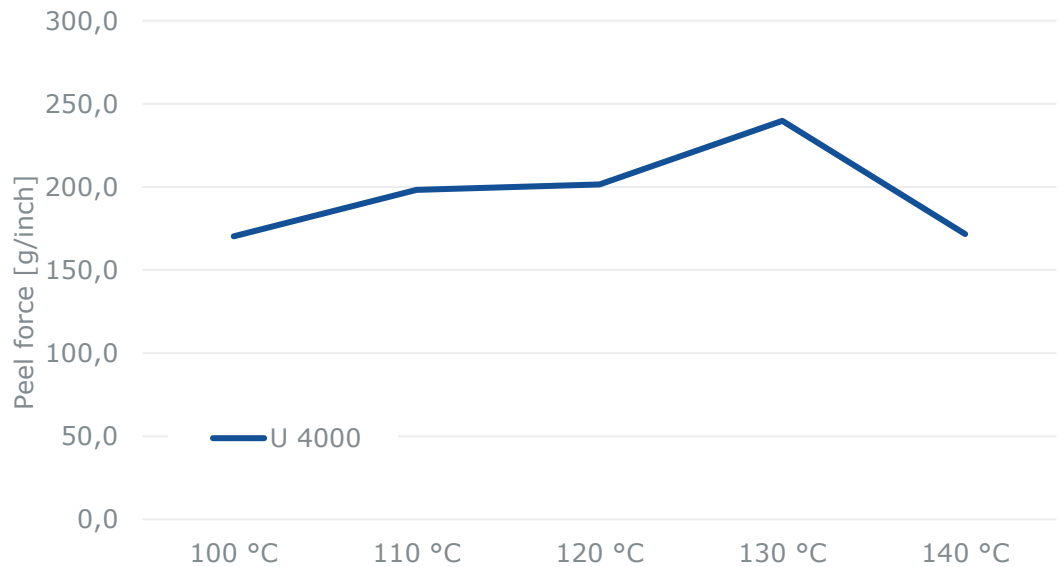
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### Heat Seal properties

**PVdC coated BOPP film** (coating weight: approx. 3 g/m<sup>2</sup> dry)

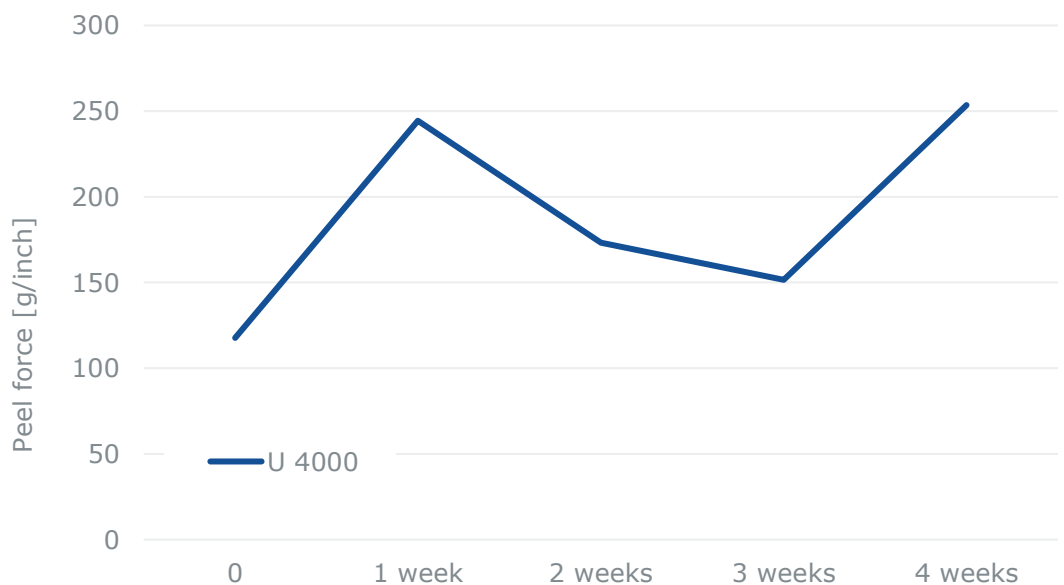
Primer: **Alberdingk® U 4000** (1s./150N)



### Humidity Seal Retention

**PVdC coated BOPP film film** (coating weight: approx. 3 g/m<sup>2</sup> dry)

Primer: **Alberdingk® U 4000** (1s./150N/120°C); 38°C @90% rel. hum.







## UV-curable dispersions

Alberdingk® UV-curables	MFFT (°C)	Main benefits
<b>LUX 250</b>	0	Workhorse UV-PUD, can be washed with water before UV-cure
<b>LUX 260</b>	0	Low Mw UV-PUD, very high gloss, good re-wetting

## Film coating highlights



### Alberdingk® Ren AC 5605

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



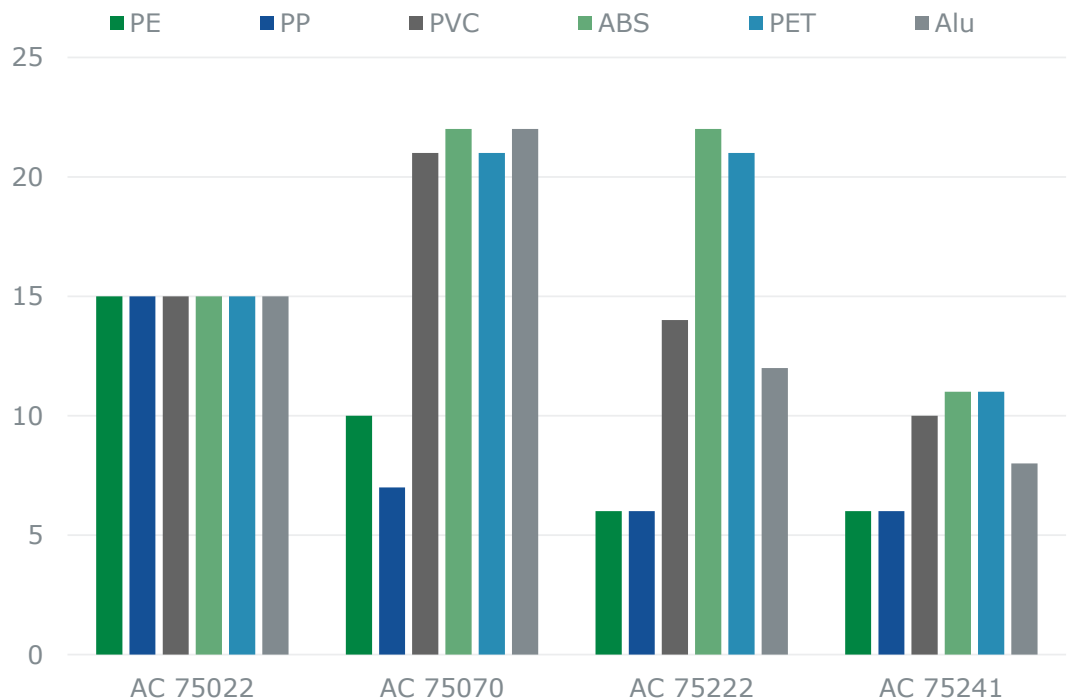


## Pressure sensitive adhesives

Alberdingk®-adhesive dispersion	MFFT (°C)	Main benefits
<b>AC 75022</b>	0	High cohesion and heat resistance - the resin is suitable for self-adhesive articles e.g. labels, tapes and foils
<b>AC 75070</b>	0	Good balance of adhesion and cohesion, high tack and high peel strength
<b>AC 75222</b>	0	High cohesion and heat resistance - suitable for producing adhesives for labels, sheets and tapes
<b>AC 75241</b>	0	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/m<sup>2</sup>, dry






## Products for paper coatings


Alberdingk® Paper coatings	MFFT (°C)	Main benefits
<b>PC 4007</b>	0	Ready to use barrier coating on paper with excellent COBB and KIT values as well as good water vapour barrier
<b>PC 4750</b>	0	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
<b>AC 2005</b>	5	Workhorse polymer for water & fat barrier
<b>AC 4605</b>	5	Same as AC 2005, but compliant to GB 9685-2016
<b>Ren AC 5605</b>	5	Biobased acrylic with superior barrier properties against water, moisture and fat. Excellent re-coatability
<b>AC 4655</b>	52	GB 9685-2016 compliant additive to improve blocking resistance

## Paper coating highlights



### Alberdingk® Ren AC 5605

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



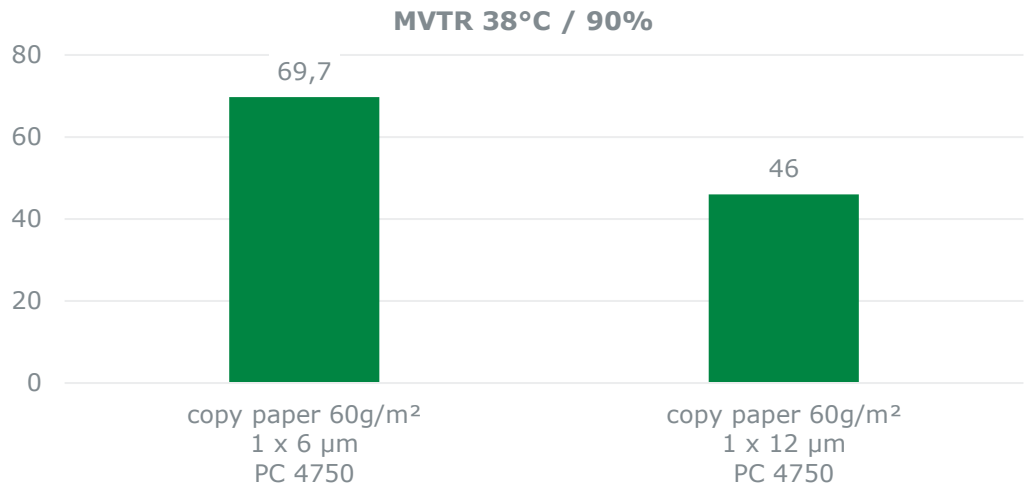
### Alberdingk® PC 4750

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

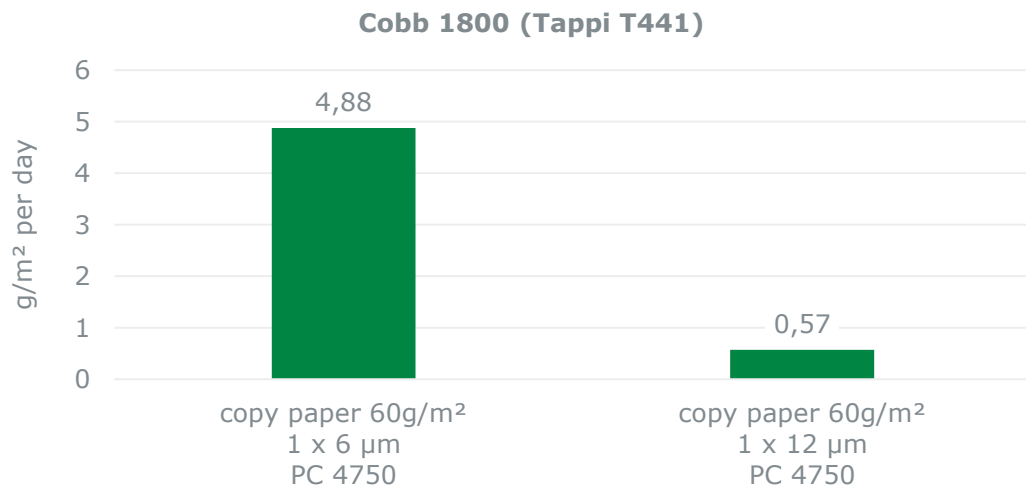


## Paper Coating performance

### MVTR (Moisture Vapour Transmission Rate)



### Cobb 1800



### KIT

Type	Film thickness	Substrate	KIT (Tappi T559)
<b>Alberdingk® PC 4750</b>	1 x 6µm	paper 60g/m²	12
	1 x 12µm	paper 60g/m²	12

## 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!

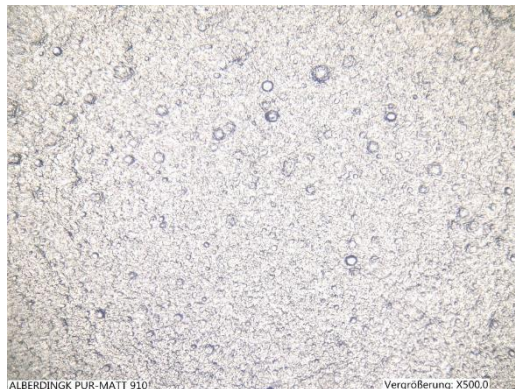
By controlling particle size, particle distribution and morphology, we can determine the degree of gloss reduction and other parameters such as haptic. Furthermore, by changing the refractive index of the polymer, we can achieve optical effects like "frost" or "etch" look.

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".

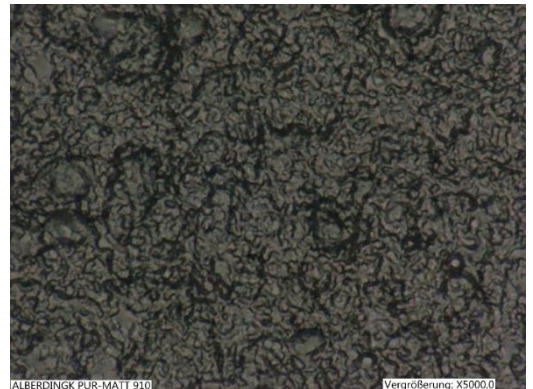
Even though the particles aren't too large and not too different size, they show a particularly efficient matting effect - this can be explained by the fact that the particles arrange themselves in "waves" during the film formation. This wave structure causes an additional matting effect.

## Light microscopy of ALBERDINGK® PUR-MATT 970

500x magnification:




5000x magnification:



Alberdingk®-inherent matt polyurethane dispersion	MFFT (°C)	Main benefits
<b>PUR-MATT 300</b>	10	Inherently matt softfeel film-surface
<b>PUR-MATT 970</b>	15	Inherently matt paperfeel film-surface
<b>PUR-MATT UV 29</b>	10	Soft, UV-curable PUD with inherently matt film-surface and high optical transparency on dark substrates
<b>PUR-MATT 111</b>	10	Soft, PUD with inherently matt film-surface and high optical transparency on dark substrates

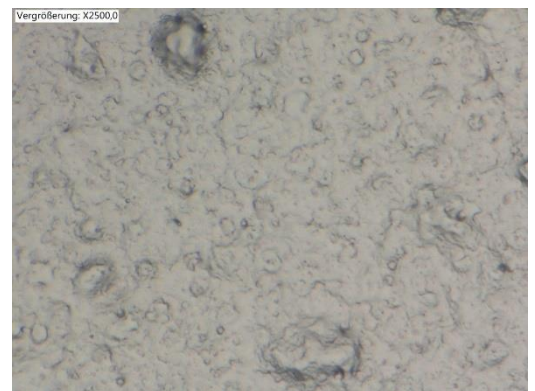
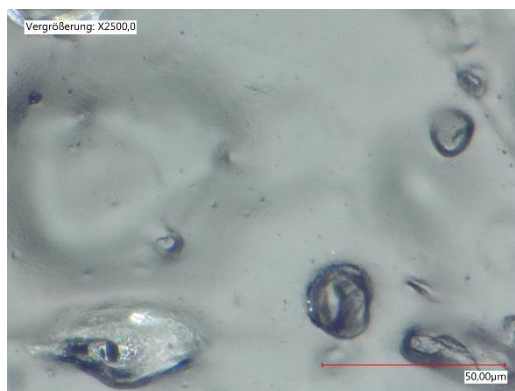
## Matt / haptic coating highlights



### 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)





## 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 3<sup>rd</sup> 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.





## Future product code nomenclature for renewable resource products:

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

## Current / forthcoming biobased portfolio

Alberdingk®- Paper coatings	MFFT (°C)	Main benefits
<b>Ren AC 5605</b>	5	Biobased acrylic with superior barrier properties against water, moisture and fat. Excellent re-coatability

*The following Alberdingk® products will be available upon request:*

<b>Ren U 355</b>	0	For the production of 1k- and 2K-adhesives for heat seal applications, e.g. furniture foil lamination, shoe adhesives
<b>Ren U 400 N</b>	0	Excellent heat seal properties, broad adhesion, hydrolysis resistant
<b>Ren U 460</b>	0	For the production of 1k- and 2K-adhesives for heat seal applications, e.g. furniture foil lamination, shoe adhesives
<b>Ren U 4040</b>	0	Adhesion to EVA, very good heat seal properties
<b>Ren U 4101</b>	0	Slightly tacky, superior adhesion, hydrolysis resistant
<b>Ren U 4000</b>	0	Biobased primer for BOPP and other plastics, excellent printability







**Notes:**

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