

A complete product line based on UBE U-varnish technology

High-performance

Competitive advantage



U-Pia...
Creating UTOPIA with UBE

UPIA[®]
エピア[®]

“UPIA[®]” is a complete Polyimide varnish product line based on UBE’s “U-varnish” brand, with new performance varnish grades developed from UBE’s extensive experience and Superior technology. UBE provides value and delivers solutions for a variety of applications through exceptional customer support.

Polyimide varnish “UPIA[®]” is a polyamic acid precursor solution of polyimide (High-performance engineering plastics). It is the base for polyimide coated films which feature non-soluble and non-melting properties, high heat, chemical resistance, and electric insulation properties achieved through high temperature curing and imidization.

--For lithium-ion batteries--

For 2ndary battery binder

UPIA-LB



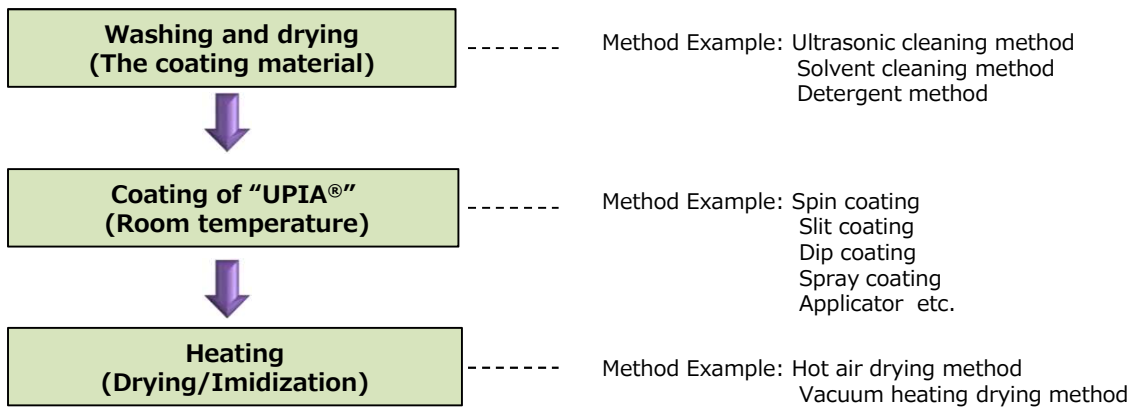
Is there something that can be used for secondary battery applications?

We have optimized UPIA-LB for lithium-ion battery binder applications.

- For battery binder applications, we strengthened and optimized the required characteristics according to our customers needs.
- UPIA-LB has the necessary toughness to overcome significant expansion of the electrode material.
- This varnish has high adhesion to Copper, aluminum and SUS, so you should improve the adhesion to the current collector compared to other binder types.
- This polyimide binder is highly resistant to the chemical exposure, it maintains performance, such as cracking resistance and adhesive strength, even immersed in the electrolyte solution.
- It has excellent long-term heat resistance, so it is able to be used in high-temperature applications.
- UPIA-LB has excellent physical properties, even with relatively low temperature processing.

Property	Unit	UPIA-AT (U-Varnish-A)		UPIA-LB				Measurement condition	Measurement Method	
		1001	2001	1001		2001				
Thickness	μm	20	20	20	20	20	20			
Heat treatment highest temp.	°C	200	350	200	350	150	200			
Solvent	—	NMP		NMP		Water				
Solid content	wt%	18.0±1.0		30.0±1.0		18.0±1.0		350°C,30min		
Solution viscosity	Pa·s	5±1		5±1		0.5±0.2		E-type, 30°C		
Film properties	Cu adhesion	—	5B	5B	5B	5B	5B		ASTM D3359	
	Al adhesion	—	5B	5B	5B	5B	5B		ASTM D3359	
	SUS adhesion	—	5B	5B	5B	5B	5B		ASTM D3359	
	Tensile strength	MPa	175	229	199	278	127	132		ASTM D882
	Elongation	%	70	92	88	107	53	45		ASTM D882
	Tensile modulus	GPa	3.2	3.7	3.2	4.0	2.8	3.2		ASTM D882
	Break energy	MJ/m ³	86	150	118	191	70	75		ASTM D882
Electrolytic liquid resistance	Weight change rate	%	+1.2	+0.2	+0.1	±0	±0	±0	25°C×24h Electrolytic liquid dipping	
	Thickness change rate	%	+0.5	±0	+0.1	±0	±0	±0		
	Tensile strength retention	%	97	100	103	102	98	100		ASTM D882
	Elongation retention	%	100	99	103	103	104	100		ASTM D882
	Break energy retention	%	100	100	102	104	101	100		ASTM D882

Usage (Examples)



Packing and handling precautions

(1) Standard Packing

Packing	18kg can
	5kg can



(2) Handling precautions

- "UPIA®" is extremely stable when properly stored. Please keep it in a cool, dark place when storing for a long period of time. Always keep the lid tightly sealed when storing to prevent hydrolysis due to moisture absorption. Immediately wipe off any varnish that comes into contact with the skin and then thoroughly wash the affected area.
- Please refer to Safety Data Sheet (SDS) before use.
- "UPIA®" NMP based systems are classified as a Type 3 Petroleum Substance, Type 4 Hazardous Material under Japan's Fire Defense Law (designated quantity: 2,000 liters).

(3) Content Statement

The content provided is based on materials, data and information currently available. No guarantee is made with regard to content, physical properties or hazardous and harmful effects. Furthermore, handling precautions relate to normal handling. In unique situations requiring special handling, please use safety measures appropriate for the application and process.

UBE

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