

## Guard Insulate

### PRODUCT DESCRIPTION

Guard Insulate is a series of insulating powder coatings specially designed to meet stringent requirements of EV battery and energy storage industries. It provides safe and reliable solution with electrical insulation resistance, voltage resistance, heat resistance, chemical resistance and moisture resistance properties.

The product is also tested in accordance to UL 94 requirements for flame retardant properties.

### Application areas

Typical application areas:

Battery packs  
Busbar  
Cooling system  
Fixed rotor  
Capacitor  
Structural parts  
Other equipment parts with insulation requirements

### POWDER PROPERTIES

Property	Standard	Result
Specific gravity	Calculated	Typically $1.6 \pm 0.2 \text{ g/cm}^3$

### Storage

Keep in a dry cool area. Maximum temperature 25 °C. Maximum relative humidity 60 %. If stored longer than 6 months a quality test must be performed.

### APPLICATION

#### Pretreatment

The overall performance of the coating system is largely dependent on the nature of the substrate and the type and quality of the pretreatment. For optimal results, it is recommended to follow the pretreatment supplier's instructions and recommendations.

#### Powder application

Curing schedule	Object temperature	Time
Guard Insulate	200 °C	10 minutes

Other curing schedules can be created upon technical approval.

Recommended film thickness ( $\mu\text{m}$ ): 150-200

#### Equipment

Suitable for Corona or Tribo charging equipment.

## APPEARANCE

<b>Colour</b>	The product is available in a wide assortment of custom-made colours, including RAL and NCS.	
<b>Gloss</b>	ISO 2813 (60°)	60-100
<b>Finish</b>	Smooth	

If the significant surface is too small or unsuitable for the gloss to be measured with the glossmeter, the gloss should be compared visually with the reference sample (from the same viewing angle).

Other gloss levels are available upon technical approval.

## PERFORMANCE

The technical data provided below are typical for this product when applied as follows:

Substrate	Chrome-free aluminum panels
Film thickness (µm)	150-200

Typical values when tested.

Property	Standard	Result
<b>Adhesion</b>	ISO 2409 GB/T 9286	Cross-cut adhesion rating Gt0
<b>Film hardness</b>	ASTM D 3363 Gauge test (modified) GB/T 6739 Modified	≥HB (No damage of film)
<b>Dielectric strength</b>	IEC 60243-1 GB/T 1408.1	> 40 KV/mm
<b>Impact resistance</b>	GB/T 1732	≥5J direct impact No cracking Impact position meet the requirements of insulation and voltage resistance after test.
<b>Surface resistivity</b>	IEC 62631-3-2	> 10 <sup>14</sup> ps (Ω/sq)
<b>Volume resistivity</b>	IEC 62631-3-1	> 10 <sup>15</sup> pv (Ω·cm)
<b>Insulation resistance</b>	Internal Method (DC 1000V, 60s)	>9000 MΩ
<b>Voltage resistance</b>	Internal Method (DC 3800V, 60s)	Leakage current <0.05 mA
<b>Insulation after abrasion resistance</b>	ISO 7784-2 ASTM D4060 GB/T 1768 (loading 1KG, CS-17, 45/min, 3000 cycles)	Meet the requirements of insulation and voltage resistance after abrasion test
<b>Cyclic temperature and humidity test</b>	GB 38031 (55 °C, 6 cycles)	No blistering, no cracking, no peeling off and no loss of adhesion.. Meet the requirements of insulation and voltage resistance after test.
<b>High temperature resistance</b>	ISO 3248 GB/T 1735 (130 °C, 1000 Hrs)	No blistering, no cracking, no peeling off and no loss of adhesion. Meet the requirements of insulation and voltage resistance after test.

<b>Cyclic temperature test</b>	ISO 6469-1 Modified GB 38031 Modified (-40°C~85°C, 1000 cycles)	No blistering, no cracking, no peeling off and no loss of adhesion. Meet the requirements of insulation and voltage resistance after test.
<b>Acid and Alkaline resistance</b>	ISO 2812-1 GB/T 9274 (5% HCl-2Hrs & 5% NaOH-2 Hrs)	No blistering, no wrinkling, no cracking, no peeling off and no loss of adhesion. Meet the requirements of insulation and voltage resistance after test.
<b>Water resistance</b>	ISO 2812-2 GB/T 1733 (25°C, 168Hrs)	No blistering, no cracking, no peeling off and no loss of adhesion. Meet the requirements of insulation and voltage resistance after test.
<b>Flame retardancy</b>	UL 94	Rating V-0
<b>Prohibited substances</b>	RoHS ELV REACH	Meet all requirements
<b>Hydrothermal ageing</b>	IEC 60068-2-67 GB/T 2423.50 (85°C and 85% RH for 1000 hours)	No blistering, no cracking, no peeling off and no loss of adhesion.
<b>Comparative tracking index (CTI)</b>	IEC 60112	≥ 400

### Sustainability

Powder coating is applied in air-and-powder mix in a strictly controlled factory process using electrostatic gun and a high temperature curing oven to create film. Virtually no VOCs are released in the process compared to traditional liquid paints. Unused or oversprayed powder can be recycled with minimal wastage. In addition, all Jotun Powder Coatings' products do not contain intentionally added lead.

### Disclaimer

The information in this document is given to the best of Jotun's knowledge, based on laboratory testing and practical experience. Jotun's products are considered as semi-finished goods and as such, products are often used under conditions beyond Jotun's control. Jotun cannot guarantee anything but the quality of the product itself. Minor product variations may be implemented in order to comply with local requirements. Jotun reserves the right to change the given data without further notice.

Users should always consult Jotun for specific guidance on the general suitability of this product for their needs and specific application practices.

If there is any inconsistency between different language issues of this document, the English (United Kingdom) version will prevail.