

Guard Insulate HR S

PRODUCT DESCRIPTION

Guard Insulate HR S is a series of insulating powder coatings specially designed as primer and top-coat for 3 layer coating system or as standalone coating for battery packs to prolong the safe time without occurrence of fire penetration against external or internal fire.

The product provides electrical insulation and flame retardant properties to prevent coating system from self-ignition in case of thermal runaway propagation.

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

Application areas

Typical application areas:

Upper cover of battery pack

Battery and module enclosure

Busbar

Structural parts

Heat insulation plate

Other equipment parts with flame retardancy and flame resistance requirements

POWDER PROPERTIES

Property	Standard	Result
Specific gravity	Calculated	Typically $1.75 \pm 0.2 \text{ g/cm}^3$

Storage

Keep in a dry cool area. Maximum temperature 25 °C. Maximum relative humidity 60 %. If stored longer than 3 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 HR S*	180 °C	10 minutes

* Guard Insulate HR S can also be cured at 170°C for 15 minutes.

Other curing schedules can be created upon technical approval.

Recommended film thickness (μm): ≥ 140

Equipment

Suitable for Corona or Tribo charging equipment.

APPEARANCE

Colour	Black
Finish	Smooth

PERFORMANCE

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

Substrate	Zinc phosphated cold rolled steel or zinc phosphated hot dipped galvanized steel
Substrate thickness (mm)	0.8
Film thickness (µm)	140-220

Typical values when tested.

Property	Standard	Result
Prohibited substances	RoHS ELV	Meet all requirements
Adhesion	ISO 2409 GB/T 9286	Cross-cut adhesion rating Gt0
Film hardness	ISO 15184 GB/T 6739	≥B
Impact resistance	GB/T 1732	≥3J direct impact. No peel off.
Tensile strength	ISO 6922 GB/T 6329	≥7 MPa
Shear strength	ISO 4587 GB/T 7124	≥7 MPa
Surface energy	Internal Method (Dyne Pen test)	≥30 mN/m
Flame retardancy	UL 94	V-0
Self-ignition resistance (with both side coating)	Internal Method (Front side of the coated object is exposed to open flame using acetylene torch (3000°C) for 30 minutes. At the end of the exposure, coating at the back side is assessed for self-ignition)	No sign of self-ignition on the coating
Insulation resistance	Internal (DC 1000V, 60s)	>500 MΩ
Voltage resistance	Internal Method (DC 2700V, 60s)	Leakage current <1 mA
Neutral salt spray resistance	ISO 9227 GB/T 1771	With scribe: corrosion creep ≤2 mm after 480hrs No scribe: no blistering, no wrinkle and no cracking after 1680 hrs

Cyclic temperature and humidity test	GB 38031 (55°C, 6 cycles)	No blistering, no cracking, no peeling off and no loss of adhesion.
Cyclic temperature test	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.
Acid and Alkaline resistance	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
Water resistance	ISO 2812-2 GB/T 1733 (25°C, 168Hrs)	No blistering, no cracking, no peeling off and no loss of adhesion.
Hydrothermal ageing	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.

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.