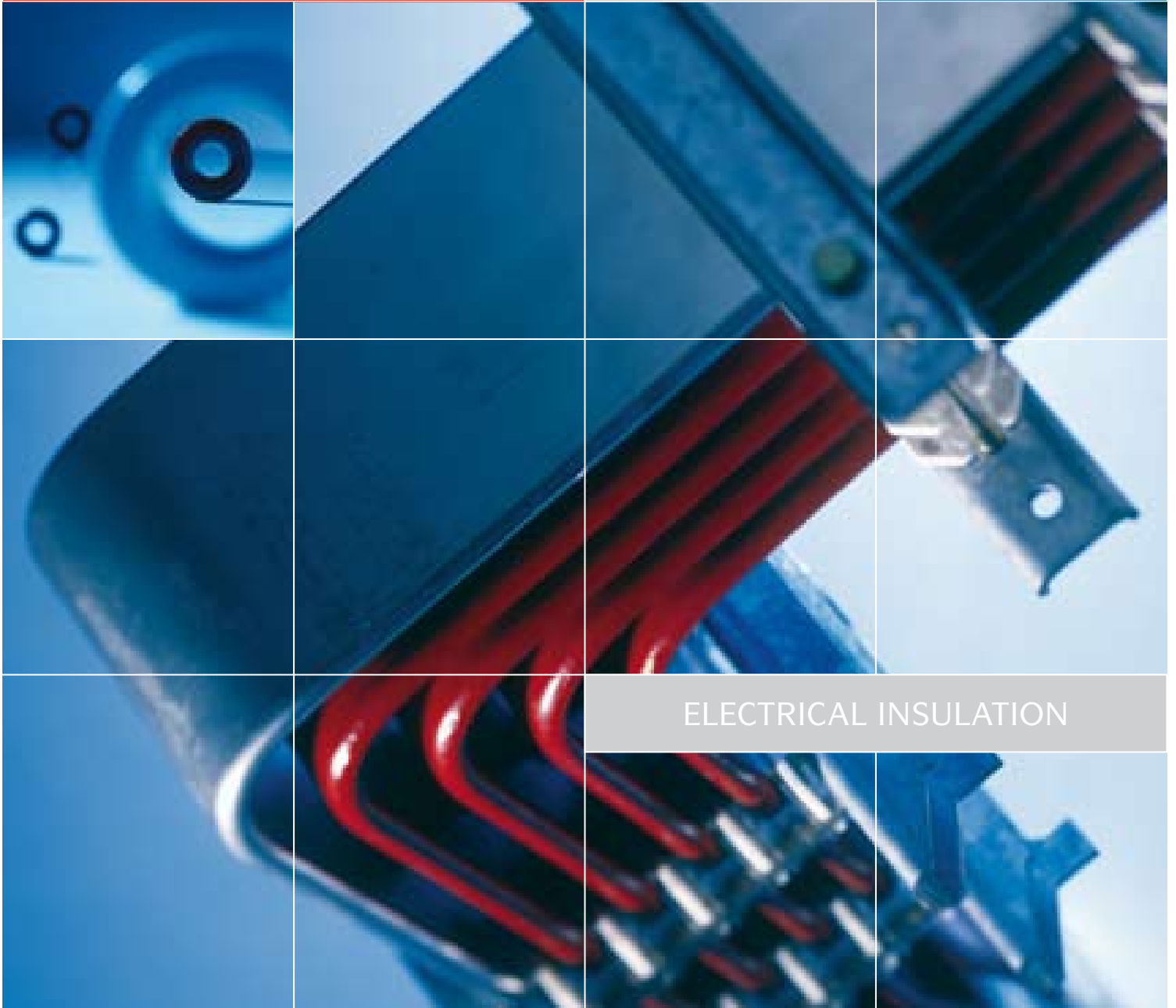


RESICOAT®



ELECTRICAL INSULATION




AkzoNobel



RESICOAT® – EL, EL1, EL4 series

epoxy powder for electrical insulation




Compared to the insulation achieved with thermoplastics and paper, Epoxy Powder Coatings offer a high adhesion to metal (up to 25 MPa) as well a high mechanical strength even at 300° C.

FIELD OF APPLICATION

The main fields of application for epoxy powders in Electrical Insulation are slot insulation, coil impregnation, core insulation, insulation of wire and bus bars and the encapsulation of electronic components.

SUITABILITY



Fire regulations require that coated electronic components must not burn when exposed to heat. Our products for insulation of electronic components comply with the relevant standard – UL directive 94.

THIS IS OUR SPECIALITY

Our established RESICOAT® powders are very economical and environmentally friendly.

We have a great variety of possible formulations for

- ▶ Cut through temperature
- ▶ Chemical resistance
- ▶ Good isolation properties
- ▶ Flame retardancy
- ▶ Laser marking
- ▶ Colour, gloss, flow and reactivity

Special advantages of slot insulation / armature coating

- ▶ Optimised heat transfer from the coil to the bottom plate ensures a longer lifetime and improves cooling and output. The more compact construction results in less weight
- ▶ The resin-bound of the lamella components increases the stability of the product, reduces vibration noise and achieves additional permanent corrosion protection.
- ▶ Insulation in the slot without air gap allows a higher slot fill-factor for more wire, which results in a higher engine power / output
- ▶ Even skewed slots can be coated homogeneously (noise reduction)

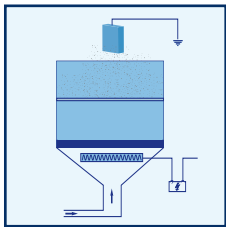


Many objects can be coated with only one powder quality which simplifies stock holding.

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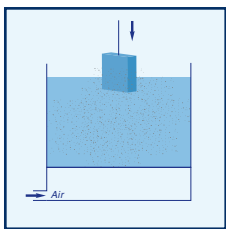
coating processes

We have many decades of experience in the field of Electrical Insulation. Almost every task can be solved with epoxy powder coatings. This of course requires a great variety of special formulations and custom designed products which we adapt to the different coating processes.



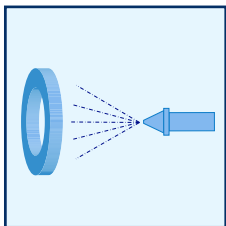
ELECTROSTATICALLY ASSISTED FLUIDISED BED COATING

In the so called EFB (Electrostatic Fluidised Bed) process the powder is fluidised in a bed using ionised air. This causes an electrostatic charge to be imparted to the powder. When the earthed objects are immersed in the fluidised bed, excellent coverage occurs, even into areas where penetration would normally be prevented by the Faraday cage effect. The powder is then cured by passing the work piece through an oven. Since the object to be coated is not pre-heated, it is possible to selectively remove excess areas of powder application, should these occur,



COATING BY FLUIDISED BED

In fluidised bed applications the object to be coated is heated to a temperature above the powder's melting point and then is immersed in the coating material which is contained in a fluidised bed. The typical immersion time is 1 – 5 seconds which allows a coating build up of between 200 – 2000 μm . Depending upon the type of material being coated and the thickness of coat applied, post curing may be required. In each case the coating material must be especially designed for this method of application.



COATING BY ELECTROSTATIC POWDER SPRAYING

Coating by electrostatic powder spraying uses a spray gun in which powder particles are charged with a high voltage. The electrostatic field causes deposition of the charged powder onto the grounded work piece. Many work pieces can be coated at one time. It is also possible to achieve all round coating of such work pieces by the wrap round phenomenon.



SPRAY APPLICATION TO PRE-HEATED OBJECTS

In this application method powder is transported from a hopper and then spray applied to a pre-heated object. Any powder not taken up by the object is collected in an after filter and is subsequently re-used in the coating process.

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technical data

FIELD OF APPLICATION	POWDER CHARACTERISTICS	COATING VALUES
<p>Slot insulation</p>  A photograph showing several electrical components, likely transformers or coils, with their slots filled with a dark, granular powder for insulation.	<p>Gel time, ISO 8130-6, 15-120 sec. 200° C Density, ISO 8130-2, 1.5-1.7 g/cm³ Softening above 70° C Kofler Storage stability ≤ 3 mon. at room temp.</p>	<p>Edge coverage > 40 % Break down voltage > 30 kV/mm Cut through temperature > 300° C</p>
<p>Coil Impregnation</p>  A photograph of a cylindrical coil with several wires extending from it, coated with a dark, granular powder.	<p>Gel time, ISO 8130-6, 30-300 sec. 200° C Density, ISO 8130-2, 1.25-1.7 g/cm³ Softening above 60° C Kofler Storage stability ≤ 4 mon. at room temp.</p>	<p>Penetration into the winding very high Curing cycle: 10 – 60 min, 200° C Cut through temperature 130-300° C</p>
<p>Core insulation</p>  A photograph showing several circular and rectangular components, likely transformer cores or bus bars, coated with a dark, granular powder.	<p>Gel time, ISO 8130-6, 30-100 sec. 200° C Density, ISO 8130-2, 1.4-1.7 g/cm³ Softening above 70° C Kofler Storage stability ≤ 4 mon. at room temp.</p>	<p>Edge coverage > 20 % Cut through temperature > 100° C Thermal expansion coefficient $3 \times 10^{-5}/K$</p>
<p>Insulation of wire and bus bars</p>  A photograph showing a red wire and a bus bar coated with a dark, granular powder.	<p>Gel time, ISO 8130-6, 20-120 sec. 200° C Density, ISO 8130-2, 1.3-1.7 g/cm³ Softening above 60° C Kofler Storage stability ≤ 4 mon. at room temp.</p>	<p>Breakdown voltage > 40 kV Elongation > 10 % Cut through temperature > 100° C</p>
<p>Encapsulation of electronic components</p>  A photograph showing several electronic components, likely diodes or transistors, encapsulated in a dark, granular powder.	<p>Gel time, ISO 8130-6, 50-90 sec. 160° C Density, ISO 8130-2, 1.4-1.7 g/cm³ Softening above 60° C Kofler Storage stability 4 mon. ≤ 6° C</p>	<p>Curing cycle: 90 min., 140° C Thermal expansion coefficient $3 \times 10^{-5}/K$ Meets UL 94 (V-0) According to colour: laser markable</p>

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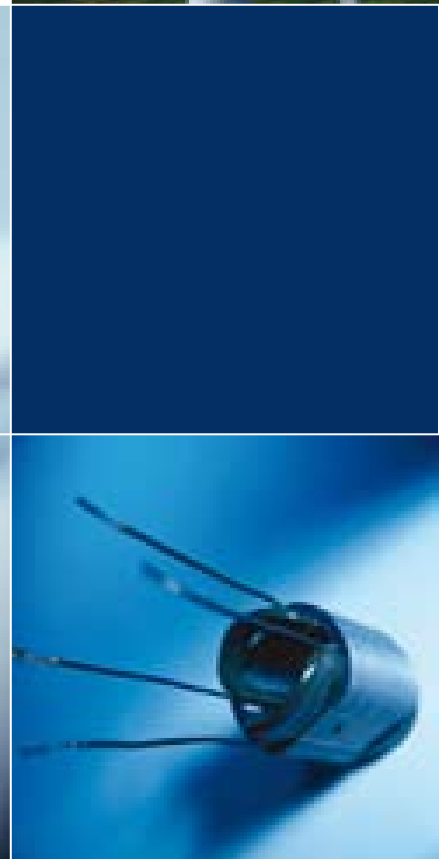
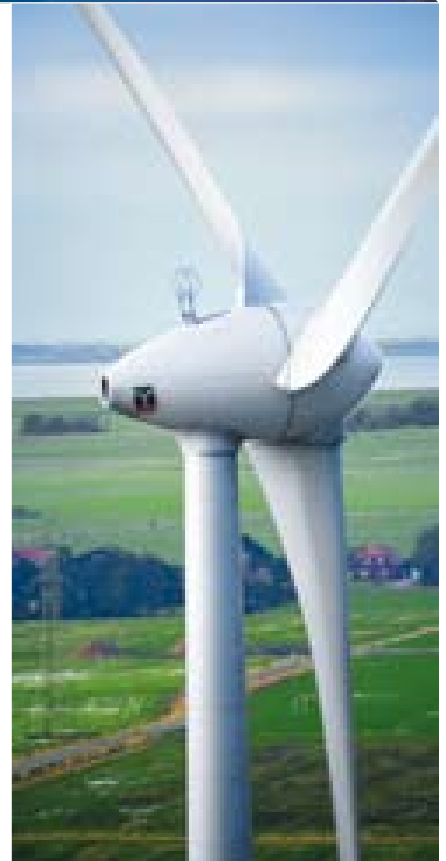
meets industry standards

RESICOAT® EL EPOXY POWDERS

- ▶ are tested and listed by Underwriters Laboratories Inc.
- ▶ are UL listed for insulation of bus bars (electrostatic spray application and fluidised bed application) UL 94 (V-0)
- ▶ for electronic components which meet UL 94 (V-0)
- ▶ are laser markable, depending on the product
- ▶ meet IEC 455 as main insulation for rotors, stators and transformers in their electrical insulation
- ▶ are rated in class F (155° C) and class H (180° C) acc. UL 1446 (system approval)

FIELD OF APPLICATION

- ▶ Bobbin
- ▶ Bus bars
- ▶ Electronic components
- ▶ Field coils
- ▶ Housings
- ▶ Rotors
- ▶ Stators
- ▶ Toroid rings
- ▶ Transformers
- ▶ Wire coating
- ▶ Wire winding



GLOBAL

RESICOAT® global connections

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You may also contact the head office in Reutlingen, Germany of our Business Unit Functional Powder Coatings.

As part of AkzoNobel, the world's largest coatings company, we are committed to the highest possible standards of quality in all aspects of our business – in over 25 manufacturing plants world-wide and sales operations in more than 50 countries. Drawing on 30 years experience as world leader in powder coatings, we are uniquely placed to meet the needs of our customers locally and globally.

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