

# Anti corona

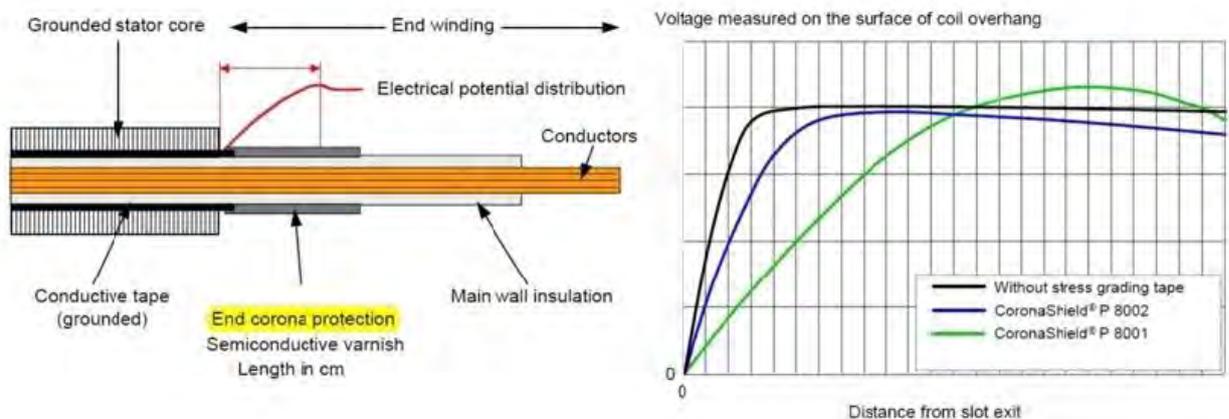
## CoronaShield® P 8001

- Semi conductive varnish for end corona protection (stress grading)
- Strong stress-grading characteristic
- Becomes hard after thermal aging
- Suitable for RR as well as VPI
- Compatible with epoxy anhydride systems

### General description

CoronaShield® P 8001 is a modified phenolic resin with a semi conductive filler, for use up to class F (155°C), suitable for Resin Rich and can also be used for VPI processed machines.

### Impact Shock test



### Application

In electricity, a corona discharge - also called partial discharge - is an electrical discharge caused by the ionization of a fluid surrounding a conductor. This occurs when the potential gradient exceeds a certain value but conditions are insufficient to cause complete electrical breakdown or arcing. Precautions must be taken to prevent the onset of corona, otherwise free radicals and ions generated in corona reactions will rapidly destroy organic materials such as binder resins and polymer films. These materials are necessary to provide a sufficient mechanical strength of the coil or bar and to give a tight fit in the slot. Erosion of organic materials in the insulation may be regarded as one of the initial steps leading to failure of the machine.

The use of corona protection materials is recommended for machines with a rated voltage  $\geq 1$  kV.

### End Corona Protection (Stress Grading):

There is an increase of electric field strength at the slot exit of the stator which can cause flashovers on the surface of the coils or bars. This can be prevented by applying end corona protection materials. These materials have a nonlinear current-voltage characteristic and show a stress-grading effect on the main wall surface.

Properties	Unit	Value	Test norm
Density	g/cm <sup>3</sup>	ca. 1.28	ISO 2811-2
Flash point	°C	≥14	ISO 1523
Solid content	%	52 ± 3	IEC 60464-1/-2
Viscosity at 20°C	mPa.s	1000 ± 100	DIN 53019
Thermal class	°C	155	IEC 60085
Drying time at 23°C - Surface	minutes	30	DIN 46449
Drying time at 23°C – Complete dry	h	10	DIN 46449

#### Scope of Application:

By applying the product we add a semi conductive layer at the slot exit of high voltage coils. We thus reduce electrical stress outside the core, where the electrical field strength would otherwise lead to damages on the insulation. The varnish is intended for use in both Resin Rich and VPI processed machines.

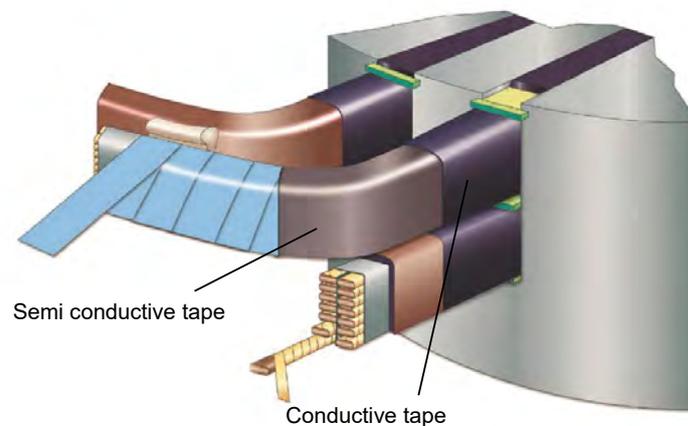
#### Basis for selection

The selection of suitable materials depends on the type of high-voltage machine that is to be deployed as well as the insulation system and techniques that are used (VPI or RR).

The main differences between CoronaShield® P 8001 and CoronaShield® P 8002 are the flexibility and the stress-grading characteristic.

	8001	8002
<b>End corona protection</b>	<b>strong</b>	<b>slight</b>
<b>Adhesion on rigid insulation - e. g. Samicaflex</b>	<b>good</b>	<b>good</b>
<b>Adhesion on flexible insulation - e. g. Samicaflex</b>	<b>medium</b>	<b>good</b>
<b>Resistance to moisture, oil, solvents</b>	<b>very good</b>	<b>good</b>
<b>Thermal ageing</b>	<b>good becomes hard</b>	<b>good remains flexible</b>

#### Processing



### Processing instructions

Because of the high density of the pigment, it settles quickly at the bottom of the container, therefore the varnish must always be stirred thoroughly before use.

The varnish can be applied to all surfaces with a brush. The viscosity can be adjusted by using the appropriate thinner 9139.

We recommend to apply individual thin coatings, resulting in a final layer thickness of 0.2 - 0.5 mm. Between the different coatings at least 30 minutes must elapse, to enable drying of the previous layer.

The varnish should overlap the conductive layer by 20 mm. You can calculate the recommended axial length of the stress grading varnish with following formula:

- Length in cm from slot exit = Maximum test voltage of coil in kV / 2
- e.g. for 11 kV coil we have a test voltage =  $2 \times 11 \text{ kV} + 1 = 23 \text{ kV}$
- $L = 23 / 2 = 11.5 \text{ cm}$

For Resin Rich applications, either Epoflex® 215.01 or Epoflex® 219.61-10 should be applied over the semi conductive tape as a protective covering layer.

For VPI applications, we recommend a covering of the tape with a shrinkable woven polyester tape 106.01 or Epoflex® 324.03.

Please do not hesitate to contact us for detailed processing recommendations regarding your application.

### Related products

Other End Corona Products:

- 8002 Semi conductive varnish (mainly for maintenance)
- 217.01 / 217.21 Semi conductive tape (B-stage "slight" stress-grading characteristic)
- 217.02 / 217.22 Semi conductive tape (B-stage "strong" stress-grading characteristic)
- 217.24 Semi conductive tape (B-stage "medium" stress-grading characteristic)
- 217.31 Semi conductive tape (C-stage "medium" stress-grading characteristic)

Complementary products:

- 215.51 / 215.51-03 / 215.55 Conductive polyester fleece tape (Internal/External Corona Protection)
- 215.71 Conductive glass fabric tape (Internal/External Corona Protection)
- 215.73 Conductive polyester/glass fabric mixed tape (Internal/External Corona Protection)
- 8003 Conductive varnish (External Corona Protection)
- 8004 / 8019 Conductive mastic (Internal Corona Protection)
- 432.10-01 / 432.11 Conductive Vetronite® sheet (slot packing material)
- 92200 Conductive Side Ripple Springs-Vetronite® (for side walls of slot wedges in generators)

### Storage conditions

CoronaShield® P 8001 varnish should be stored in sealed original containers. Pigmented varnishes tend to settle and must be stirred before use.

### Shelf life

12 months at 20 – 25°C

### Form of delivery

CoronaShield® P 8001 varnish is supplied ready for use in cans of 1, 2, 5, 10, 20, or 25 kg.

### Health and safety

CoronaShield® P 8001 varnish is non toxic. We recommend however, that good hygiene practices be adopted, including hand washing and the use of barrier and cleansing creams.

The product properties set forth in this data sheet are based on the results of testing of typical material produced by the affiliated companies of Von Roll Holding Ltd. (underneath referred as Von Roll). Some variation in product properties is typical. Comments or suggestions relating to any subject other than product properties are offered only to call the end-user's or other person's attention to considerations which may be relevant in the independent determination of the use and/or manner of use of product. Von Roll does not claim or warrant that the use of its product will have the results described in this data sheet or that the information provided is complete, accurate or useful. The user should test the product to determine its properties and its suitability for the intended use. Von Roll expressly disclaims any liability for any damage, harm, injury, cost or expense to any person resulting directly or indirectly from that person's reliance on any information contained in this data sheet. Nothing contained in this data sheet constitutes representation or warranty as to any matter whatsoever. Von Roll makes no warranties whatsoever in this data sheet, expressed or implied, including any implied warranty or fitness for a particular use or purpose. Von Roll shall in no event be liable for incidental, exemplary, punitive or consequential damages