

Internal Corona Protection (IGS)

Product	Type	Composition
Conductive mastic	8004	Mica powder, epoxy resin with conductive filler
Conductive polyester fleece tape	215.55	Polyester fleece, epoxy resin with conductive filler

External Corona Protection (AGS)

Product	Type	Composition
Conductive varnish	8003	Alkyd resin with conductive filler
Conductive polyester fleece tape	215.51	Polyester fleece, epoxy resin with conductive filler
Conductive polyester fleece tape	215.51-03	Polyester fleece, epoxy resin with conductive filler
Conductive polyester fleece tape	215.55	Polyester fleece, epoxy resin with conductive filler
Conductive Vetronite® sheet	432.10-01	Glas fabric laminate, epoxy resin with conductive filler
Conductive Vetronite® sheet	432.11	Glas fabric laminate, epoxy resin with conductive filler
Conductive Side Ripple Springs - Vetronite®	92.200	Glas fabric laminate, epoxy resin with conductive filler

End Corona Protection (EGS)

Product	Type	Composition
Semiconductive varnish	8001	Modified phenolic resin with semiconductive filler
Semiconductive tape	217.01 / -21	Woven polyester fabric, epoxy resin with semiconductive filler
Semiconductive tape	217.02 / -22	Woven polyester fabric, epoxy resin with semiconductive filler
Semiconductive tape	217.31	Woven polyester fabric, polyurethane resin with semiconductive filler

Complementary Products

Product	Type	Composition
Epoflex®	215.01	Polyester fleece, epoxy resin
Epoflex®	219.61-10	Woven polyester / glass fabric, epoxy resin
Epoflex®	324.03	Woven polyester / glass fabric, epoxy resin and polyester film

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Von Roll Isola

Von Roll Isola develops, produces and sells technologies worldwide for the electrical engineering industry. The commitment to our customers of constantly creating added value, of supplying the best products and services available on the market and of providing access to a global network and experience, motivates us to constantly devise innovations.

Von Roll Isola is a leading company in the field of corona protection for electrical high-voltage machines. The systems we develop and produce are used around the world and are suitable for all standard applications.

The main features of these systems are:

- Tried-and-tested system compatibility
- Outstanding and constant quality
- State-of-the-art and practical test methods
- Technical customer advice service
- References of our main customers

Corona Protection

Due to the uneven distribution of the field strength in the windings within high-voltage machines, partial discharges can arise particularly in the slot area and at the slot end. These electrical discharges (visible as glow discharge or corona discharge) can quickly destroy the insulation of an electrical machine. For this reason, additional corona protection materials with specific conductive and semiconductive properties are used.

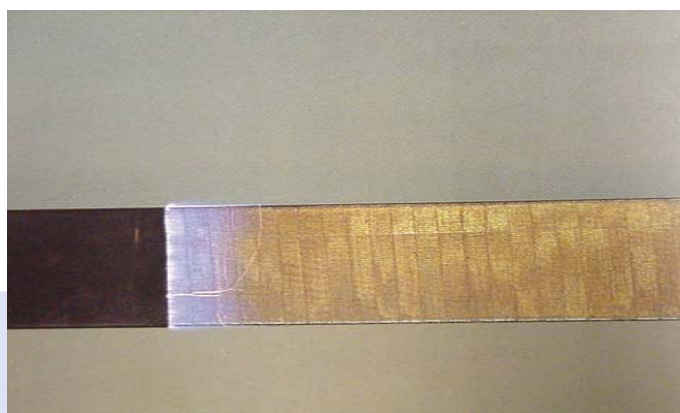


Figure: Insulated bar under high voltage; visible glow discharge at the transition from the conductive to the non-conductive surface.

Internal Corona Protection (IGS)

On the surface of conductor stacks, particularly in the case of Roebel bars, any sharp corners will lead to high local field strengths.

To control the electrical field at the conductor stack and to prevent partial discharges (corona), also in any cavities that may exist, we recommend using internal corona protection (IGS).

- Conductive mastic 8004
- Conductive polyester fleece tape 215.55



Figure: Conductive and semiconductive corona protection tapes

External Corona Protection (AGS)

Within the slots, tolerances in the dimensions of coils and stator stacks often lead to the creation of cavities between the slot side and the bar insulation, which in turn can produce corona discharges.

To homogenize the electrical field between the insulation and the slot side and to prevent corona discharges in the cavities, we recommend using external corona protection (AGS).

- Conductive varnish 8003
- Conductive polyester fleece tape 215.51
- Conductive polyester fleece tape 215.51-03
- Conductive polyester fleece tape 215.55
- Conductive Vetronite® sheet 432.10-01
- Conductive Vetronite® sheet 432.11
- Conductive Side Ripple Springs-Vetronite® 92.200

End Corona Protection (EGS)

At the slot end, due to the highly non-uniform electrical field, excessive increases in local field strengths often arise, which in turn can lead to corona discharges.

To prevent this and to ensure the controlled reduction of these excessively high field strengths at the slot end, we recommend using end corona protection (EGS).

- Semiconductive varnish 8001
- Semiconductive tape 217.01 / 217.21
- Semiconductive tape 217.02 / 217.22
- Semiconductive tape 217.31

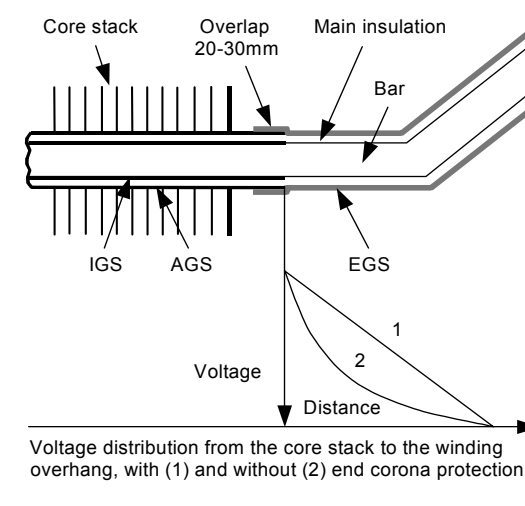


Figure: Typical application of corona protection

Note: It is possible to ensure a good contact between the external corona protection (AGS) and the end corona protection (EGS) by means of a 20 to 30mm overlap. For machines with pressure fingers, it is also necessary to ensure that the external corona protection (AGS) is extended accordingly.

Complementary Products

To protect the windings used in electrical machines against moisture, mechanical stress and strain and other environmental influences, protective tapes are additionally used. These tapes, which shrink on curing, also help to improve the contact between the external corona protection (AGS) and the end corona protection (EGS).

- Epoflex® 215.01
- Epoflex® 219.61-10
- Epoflex® 324.03

Application and Technical Advice

The selection of suitable materials depends on the type of high-voltage machine to be deployed as well as the insulation system and techniques used. Our systems are ideally suited for all standard applications.

Our application engineers are happy to advise you on any questions regarding the application, use and compatibility of our products. In this regard, ensuring the complete satisfaction and the creation of added value for our customers take priority.

Test Methods

We use our laboratories for developing and examining materials and systems on the basis of our customers' requirements with regard to their thermal, mechanical and electrical properties.

Our facilities include:

- Material and system testing in accordance with the current standards or according to special customer requirements
- Manufacturing and impregnation of test pieces (bars and coils)
- Tests performed using state-of-the-art equipment (e.g. loss angle and partial discharge measuring technology) for all the necessary thermal, mechanical or electrical tests
- Joint material and system developments, including testing

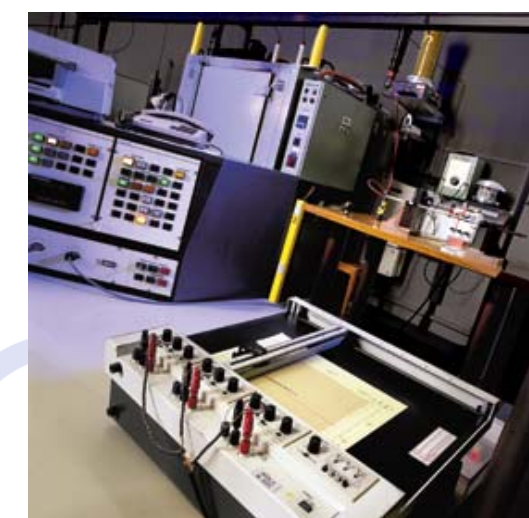


Figure: Test laboratory used for electrical tests