



Impregnating Resins and Coatings

We Enable Energy

As one of the oldest industrial companies of Switzerland, founded in 1803, we focus on products and systems for power generation, transmission and distribution, rotating machines and mechanical engineering. Von Roll is the global market leader for insulations products and the only company to offer the complete range of insulation products, composites, consulting, tests and services for the electro-technical industry.

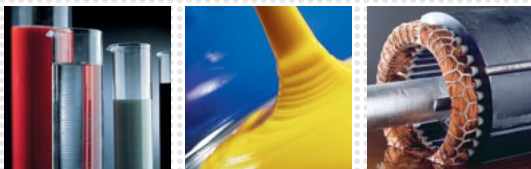
For more than 100 years, we have been making outstanding contributions to this market, developing a number of highly innovative products that have enabled both steady increases in power output and smaller and more compact machines.

Customers enjoy the following benefits:

- » One single source for all insulating materials
- » Thorough expertise from power generation and transmission to its efficient utilisation
- » Proven compatibility for system components
- » Testing at Von Roll of both materials and systems
- » Consulting for applications and technologies
- » Training in insulation materials and systems

Von Roll provides a comprehensive product spectrum of impregnating resins and coatings for the electrical industry. These products have the following characteristics:

- » For high voltage applications
- » For low voltage applications
- » To meet all international standards
- » Wide range of environmental-friendly products (green product line)
- » A wide choice of thermal classes up to class C



Atmospheric Dip and Hot Dip Process

Dipping is the most common impregnation process for any kind of low-voltage electrical component, such as motors, generators or transformers. It is highly versatile and seems very easy.

Nevertheless, the resin choice is always highly critical due to environmental constraints (smell, fire risks, irritation, toxicity and more), process issues (stability, viscosity, reactivity, productivity, etc.) and technical properties (thermal class, chemical resistance, electrical properties, bonding strength, etc.).

Product name	Chemistry	Viscosity at 23°C (mPa.s)	Typical curing temperature (°C)	UL 1446 TP rating MW 35	Main characteristics
Solvent-based					
HI-THERM® B(a)-346/A	Modified polyester	230	15	200°C	High-temperature-resistant, tough, flexible, meets MIL-I-24092D standard, universal application. Also available in black and gray colors.
HI-THERM® BC-359	Polyurethane	260	120	180°C	Low-temperature curing, flexible with superior moisture and chemical resistance.
Damisol 2014	Modified epoxy	225	175	180°C	Universal varnish with outstanding chemical resistance properties, including all freon types (hermetic motor use).
Damisol 2053 HFP	Polyesterimide	270	150	180°C	High-temperature-resistant varnish with excellent flexibility.
Water-based					
AQUA-THERM® BC-365	Polyester	Adjustable	135	180°C	Environmentally-friendly, low VOCs. Easy to dilute.
AQUA-THERM® BC-367	Polyurethane	Adjustable	110	180°C	No VOCs. No smell. Highly flexible. Fast cure at low temperature.
AQUA-THERM® BC-380	Epoxy phenolic	Adjustable	150	180°C	Highly chemically resistant varnish, including refrigerant. Strong bonding properties.
Solventless					
Damisol 3040	Polyesterimide/epoxy	200	150	180°C	Resin with outstanding bond strength at elevated temperature.
Damisol 3340	Polyesterimide	500	150	180°C	Class H resin. Outstanding dielectric properties up to 180°C.

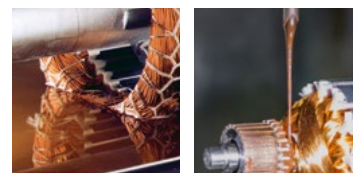
Product name	Chemistry	Viscosity at 23°C (mPa.s)	Typical curing temperature (°C)	UL 1446 TP rating MW 35	Main characteristics
Volatile organic compound (VOC)-free					
DOLPHON® CC-1105	Polyester	600	150	200°C	Low odor, low viscosity. High stability and excellent bonding strength.
DOLPHON® XL-2102	Polyester	550	150	180°C	High flash point, low odor, excellent tank stability. EN45545-2 approved for railway applications.
DOLPHON® XL-2109	Polyester	1500	150	180°C	Suitable for hot dipping (Joule effect) combined with UV curing. Excellent resin slot fill. Good crack resistance after thermal shock.
Damisol 3630 HTP	Polyesterimide	300 and 600	150	180°C	High thermal resistance. Low viscosity for an easy dipping process; suitable for hot dipping with using the Joule effect.
Damisol 3631 HiR	Polyesterimide	500	150	180°C	High thermal resistance. Low viscosity for an easy dipping process and low emissions during the process.
DOLPHON® CC-1180 LoV	Epoxy	550	150	180°C	Highly chemical- and moisture-resistant resin, good adhesion.
DOLPHON® CC-1180 HiR	Epoxy	550	150	180°C	Highly chemical- and moisture-resistant resin, good adhesion. High reactivity type for hot dipping with using the Joule effect.
Damisol 3500 LoV	Epoxy	600	160	180°C	Very low emission epoxy resin. Excellent stability and dielectric properties up to class H.
Damisol 3500 HiR	Epoxy	600	160	180°C	Very low emission epoxy resin. Excellent stability and dielectric properties up to class H. High reactivity type for hot dipping with using the Joule effect.



Impregnation dipping of ballasts.



Dipping process for stator impregnation.



Trickle and Dip-Roll Process

Trickling and roll-through processes are more convenient when high productivity is required on standard small/medium motors and generators. These two processes enable a higher resin filling factor with less resin usage.

Due to hot processes, the resin quality has to be carefully managed. Von Roll has developed and optimized a complete range of resins that combine safety, quality and fast processing.

Product name	Chemistry	Viscosity at 25°C (cps)	Typical curing temperature (°C)	UL 1446 TP rating MW 35	Main characteristics
Solventless					
DOLPHON® CC-1096	Polyester	250	130	180°C	Two-part resin, low viscosity, high bonding strength, excellent penetration, fast cure at low temperature.
Damisol 3040	Polyesterimide/epoxy	200	150	180°C	One component resin with outstanding bond strength at elevated temperature.
Gel coat					
DOLPHON® CC-1080L	Polyester gel coat	5000	130	180°C	Two-part resin, highly reactive filled gel coat. High vibration resistance.
Damisol 3007-2	Polyesterimide gel coat	20000	120	180°C	Two-part resin, excellent bonding gel coat. Very high mechanical properties under high stress. Excellent crack resistance.
Volatile organic compound (VOC)-free					
DOLPON CC-1105 OPT	Polyester	235	150	200°C	One component resin, highly stable and strongly reactive.
DOLPHON® XL-2110	Polyester	750	150	180°C	One component resin, highly stable and strongly reactive.
DOLPHON® XL-2162	Polyester	600	150	n/a	One component resin, highly reactive, low emissions. Excellent thermal resistance.
Damisol 3630 HiR	Polyester imide	300	150	180°C	Highly reactive resin for fast continuous process. Strong mechanical properties even at high temperature, including 180°C.
Damisol 3631 HiR	Polyester imide	500	150	180°C	Low emission resin for fast continuous process. Strong mechanical properties even at high temperature, including 180°C.
DOLPHON® CC-1180 HiR	Epoxy	550	170	180°C	One component highly reactive epoxy. High moisture and chemical resistance. Good adhesion.
DOLPHON® CC-1263	Epoxy	500	140	n/a	Two-part resin, with very high thermal and mechanical resistance, up to 70,000rpm.
Damisol 3500 HiR	Epoxy	600	160	180°C	One component highly reactive epoxy. High moisture and chemical resistance. Good adhesion.
Damisol 3500 HTC	Epoxy	1400	160	180°C	One component highly reactive epoxy. High moisture and chemical resistance. High thermal conductivity, 0.4W/m.K.



Vacuum Pressure Impregnation

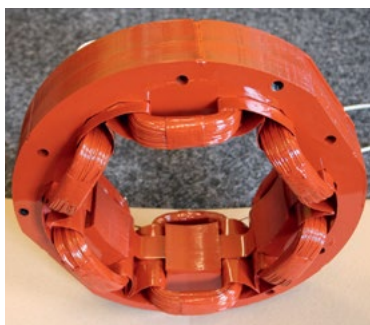
Vacuum pressure impregnation (VPI) is mainly used when the penetration and filling factor of the resin need to be improved. Von Roll offers a large choice of resins and varnishes suited to a wide range of processes and properties.

Product name	Chemistry	Viscosity at 25°C (cps)	Typical curing temperature (°C)	UL 1446 TP rating MW 35	Main characteristics
Solventless					
Damisol 3040	Polyesterimide/epoxy	200	150	180°C	Class H resin with outstanding bond strength at elevated temperature.
Damisol 3340	Polyesterimide	500	150	180°C	Class H resin. Outstanding dielectric properties up to 180°C.
Volatile organic compound (VOC)-free					
DOLPHON® CC-1105	DAP polyester	600	150	200°C	Low odor, low viscosity. High stability and excellent bonding strength.
DOLPHON® CC-1305	DAP polyester	1500	150	180°C	Semi-rigid, high-flash-point polyester. UL180 on MW 76.
DOLPHON® CC-1144	DAP polyester/epoxy modified	1500	150	200°C	Low odor and low organic emission polyester. Very good stability. High resin build and outstanding bonding strength. Also suitable for double impregnation.
DOLPHON® XL-2103	Polyester	2700	150	180°C	Thixotropic, high flash point, low emissions, excellent tank stability.
DOLPHON® XL-2112	Polyester	1850	150	180°C	High flash point, low VOCs, low odor, excellent tank stability. Good flexibility.
Damisol 3630 HTP	Polyesterimide	300 and 600	150	180°C	High thermal resistance. Low viscosity for an easy process.
Damisol 3630 VPI	Polyesterimide	3000	150	180°C	Thixotropic grade for higher resin build. Low dissipation factor up to high temperatures.
DOLPHON® CC-1118LV	Epoxy	6000	150	180°C	Thixotropic, flexibilized, superior moisture resistance and chemical resistance. Suitable for railway applications: EN45545-2 approved.
DOLPHON® CC-1180 HVi	Epoxy	2500	150	180°C	High moisture and chemical resistance. Good adhesion. Excellent thermal properties.
DOLPHON® CC-1180 HRB	Epoxy	4000	150	180°C	Thixotropic, superior moisture resistance and chemical resistance. Suitable for railway applications: EN45545-2 approved.
Damisol 3500 LoV	Epoxy	600	160	180°C	Very low organic emission epoxy resin. Excellent stability and low viscosity for easy impregnation.

Coatings

Coating is used mainly for protection of fragile or exposed components. The coating process has to be adjusted according to the varnish choice and expected properties. Several coatings are available with different colors and chemical properties to be used on many processes (brushing, spraying or dipping).

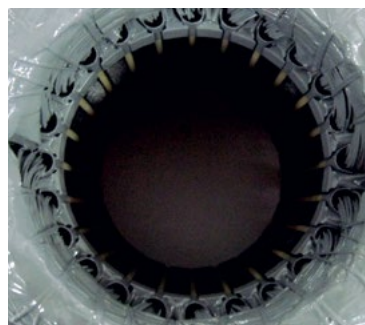
Product name	Chemistry	Viscosity at 25°C (cps)	Typical curing conditions (°C)	UL 1446 TP rating MW 35	Main characteristics
Standard protection					
SYNTHITE® AC-41*	Polyurethane	175	30min at 25°C	180°C	Two-part resin, low viscosity, high bonding strength, excellent penetration, fast cure at low temperature.
AC 43	Alkyd-based	50	30min at 25°C	180°C	One component resin with outstanding bond strength at elevated temperature.
SYNTHITE® Ex-41*	Polyurethane	300	30min at 25°C	130°C	Glossy, tough, flexible and fast-drying, abrasion, chemical, moisture resistance. UL1446 on MW 28. Commonly used on class H systems. Available in several colors, including red and black.
SYNTHITE® Ex-43	Alkyd-based	525	1h at 25°C	180°C	Tough, flexible, fast-drying chemical and moisture-resistant film. UL1446 on MW 35. Available in several colors, including red, black, gray. EN45545-2 approved for railway applications.
High protection					
HI-THERM® BG-346/A	Modified polyester	275	3h at 150°C	200°C	BC346A base with glossy gray finish.
HI-THERM® BB-359FR	Polyurethane	875	3h at 120°C	180°C	BC359 glossy black version.
Very high protection					
DOLPHON® CB-1128	Polybutadiene	Thixotropic	24h at 25°C	No	Thixotropic two component black rubber for winding protection.
DOLPHON® CW-1081	Epoxy	Thixotropic	2h at 60°C or 72h at 25°C	No	Thixotropic two component resin. Excellent abrasion and chemical resistance.



Coatings protect the tool.



Special coatings for modern PCBs (printed circuit boards).



Painted or sprayed.

We Enable Energy

Von Roll is the sole full-range supplier of materials and systems for the insulation of electrical machines as well as high-performance products for various high-tech industries.



Mica

All materials related to high-voltage insulation. Von Roll's commitment to mica starts with mining and ends with finished tapes.



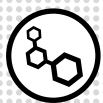
Resins

Impregnation resins for high- and low-voltage, potting resins, casting resins, as well as encapsulating and conformal coatings.



Flexibles

Insulating flexible materials for low-voltage applications such as flexible laminates and adhesive tapes.



Composites

Engineered materials made from a resin and a support structure with distinct physical, thermal and electrical properties. They can be molded, machined or semi-finished.



Cables

Mica tapes for fire-resistant cables. Von Roll provides a wide range of products that are ideally suited to all commonly used standards.



Wires

Insulated round, flat and Litz wires for high-voltage, low-voltage and electronic applications.



Testing

Von Roll provides electrical, thermal and mechanical testing of individual materials as well as complete insulating systems.



Training

Von Roll Corporate University provides a training program in high- and low-voltage insulation for its customers.

Please contact us or visit our website www.vonroll.com for further information:

Asia/Pacific

Von Roll India Pvt Ltd.

15/1/2, 20/1B,
Kempalinganahalli, NH,
48, Kunigal Road, 562 123
Nelamangala, Bangalore, India
P +91 80 4332 9200
F +91 80 2836 0153
cs.asia.india@vonroll.com

Von Roll Asia Pte Ltd.

6 Serangoon North Avenue 5
#03-01
Singapore 554910
Singapore
P +65 6556 4788
F +65 6556 4959
cs.asia@vonroll.com

Von Roll Shanghai Co., Ltd.

Unit C, No.1235
Minqiang Road, Songjiang District
Shanghai, 201612
China
P +86 21 6768 7020
F +86 21 5768 7891
cs.asia.china@vonroll.com

Americas

Von Roll USA, Inc.

200 Von Roll Drive
Schenectady, NY 12306
USA
P +1 518-344-7100
F +1 518-344-7288
cs.americas@vonroll.com

Von Roll do Brasil Ltda.

Rua Vaticano, No. 179.
06713-040, Jd. Fontana Cotia,
Sao Paulo
Brazil
P +55 11 4208 5995
F +55 11 4193 6789
cs.south.america@vonroll.com

Europe

ALBESIANO SISA vernici s.r.l.

Via Rigolfo 73, Zona Vadò
10028 Trofarello
Italy
P +39 011 649 31 11
F +39 011 649 31 12
cs.europe.liqu@vonroll.com

Von Roll Schweiz AG

Passwangstrasse 20
4226 Breitenbach
Schweiz
P +41 61 785 51 11
F +41 61 785 51 88
cs.europe.mica@vonroll.com

Von Roll France SA

145 rue de la République
69330 Meyzieu
France
T +33 478 04 59 04
F +33 478 31 66 43
cs.europe.liqu@vonroll.com

About Von Roll

Von Roll is the global market leader for electrical insulation products and the only company to provide the complete range of electrical insulation and composite products, systems and services for generators, high- and low-voltage motors, transformers and other electrical applications.

Von Roll has strong expertise in resins and varnishes worldwide, with liquids production plants in Europe (2), America (1), China (1) and India (1). In 2007 Von Roll purchased the American company John C. Dolph's, and in May 2013 Von Roll acquired the Italian company Albesiano Sisa Vernici S.r.l. With a highly committed research and development department and application laboratories in all continents, Von Roll offers a strong technical support as well as a superior sales and service network to customers all over the world.