

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

Materials related to high-voltage insulation. Von Roll's commitment is extensive including all the steps in the manufacturing process.



Flexibles

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



Wires

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



Transformers

High-performance transformers for power transmission and distribution, tailored solutions to all applications of today's energy supply companies.



Cables

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



Testing

Von Roll provides electrical, thermal and mechanical testing of individual materials as well as complete insulating systems. We are UL-certified.



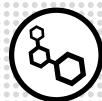
Liquids

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



Training

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



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.

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About Von Roll

As one of the longest established industrial companies in 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 in insulation products, systems and services and is represented at more than 32 locations in 19 countries with around 3,400 employees.



DAMIVAL® Resins

We Enable Energy

As one of the oldest industrial companies in 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 insulation products and the only company to offer the complete range of insulation products, composites, consulting, tests and services for the electrotechnical 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 utilization
- » 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

The requirements of the electrical and electronic industries for resins are very broad but also very specific and exacting. As a result of long and continuous work in selecting and combining appropriate raw materials, Von Roll has developed a range of two-component potting resins – DAMIVAL® resins – specially designed to fulfill the most demanding conditions of the electrical insulation and electronic protection markets.

The DAMIVAL® product range has properties excellently suited to:

- » Overmolding, encapsulation, impregnation
- » Bonding, sealing, covering, filling up empty spaces
- » Protecting against moisture, shocks and vibrations, harsh environments
- » Increasing thermal dissipation

Von Roll provides an extensive range of systems designed to insulate and to protect electrical and electronic components.



DAMIVAL® Resins

Polyurethane and Epoxy Systems for Potting and Encapsulation

Von Roll's expertise in formulating and producing resins has enabled innovative DAMIVAL® resins that simplify processing and save manufacturing time with low shrinkage and low sensitivity to moisture, and smooth outgassing during curing.

In accordance with industrial environmental programs and directives, all grades are free of halogens and volatile organic compounds (VOCs).

DAMIVAL formulations comply with the Restriction on Hazardous Substances (RoHS) regulation (2002/95/EC). Several systems are UL approved (file E108253).



We provide customers with global expertise and an in-depth understanding of their needs. Our DAMIVAL® formulations can be adapted to match specific requirements based on the properties desired. Our tailored solutions are developed in partnership with customers to achieve the most appropriate resin system for your application, equipment and expected performance.

The DAMIVAL® range includes cold curing systems, polyurethanes and epoxies, as well as hot curing epoxies for atmospheric and vacuum casting technologies.

DAMIVAL® formulations are designed to meet the most demanding specifications in numerous industries, with optimization of mechanical and thermal characteristics as well as clients' processes.



Protection and insulation of capacitive and inductive components used to filter the power coming from the windmill generator.



Encapsulation of transformers and PCBA used in trains and subways, compliant with high safety standards.



Casting of motors and sensors used for oil research and extraction.

Polyurethane DAMIVAL®

Polyurethane systems improve overall productivity. Potting and casting can be quickly achieved thanks to fast hardening at room temperature. This is a noticeable advantage over traditional materials such as silicones and epoxies.

A variety of resin formulations can be blended with several hardeners to produce many different grades, each having selected properties that match processing requirements and adequate characteristics on finished products.

Our polyurethane resins are used for potting, encapsulation, impregnation and insulation of electric devices. These tailored solutions optimize mechanical and thermal characteristics as well as clients' processes.

The main advantages of polyurethane DAMIVAL® are:

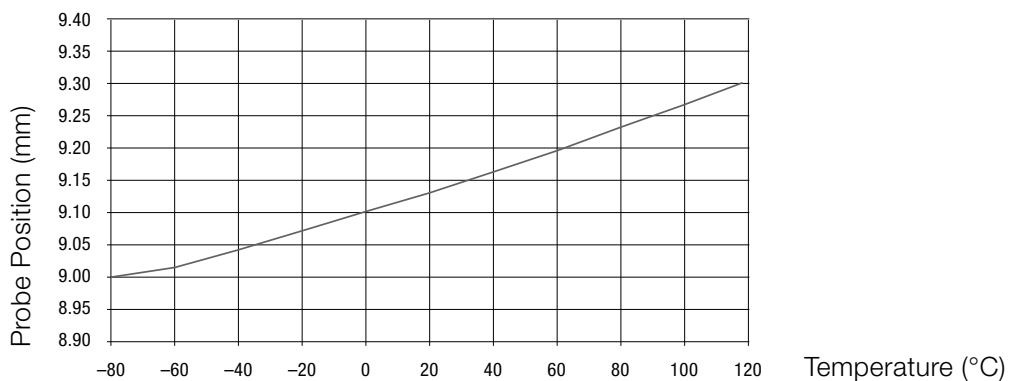
- » Adaptable viscosity and gel time
- » Customized processability
- » Variable flexibility of the cured resin
- » Low shrinkage
- » Low exothermic reactions
- » Good adhesion on most surfaces
- » Excellent resistance to vibrations and rising temperature
- » Suitable for a wide range of operating temperatures, from -60°C up to 155°C



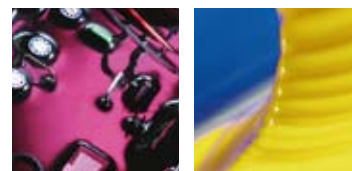
Von Roll has available a twofold range of DAMIVAL® polyurethane resins: 135xx and the 136xx.

The 136xx resin systems are «real» elastomer materials that combine outstanding adhesion, flexibility even at very low temperature as well as very low moisture absorption. These are cost-effective substitutes for silicone elastomers.

TMA method shows a high stability of the Coefficient of Thermal Expansion from -60°C up to 120°C for DAMIVAL® 13653



DAMIVAL® polyurethane resin is designed to efficiently integrate many fields of applications in the electronic, electrical, power-supply device, medical, automotive, marine, railway, aircraft and military industries.



The following table shows the comparative values for different references of DAMIVAL® polyurethane resin:

Reference		Mix ratio	Color	Mix viscosity	Gel time	Shore hardness	Thermal conductivity	Glass transition	UL94	Main characteristics
Resin	Hardener	Weight		MPa.s, 25°C	Minutes, 25°C		W/m.K	temperature °C		
13518	13500	100/35	white, red, black, gray	2000	35 or 90	87D	0.45	80	V0	Compliant with NF16-101 railway standard, UL listed, very rigid, used for capacitors and transformers.
13522	13500	100/40	black	1000	8 or 65	87D	0.45	90		High glass transition temperature, very low viscosity, suitable for transformers and sensors.
13524	13500	100/24	beige	1500	50	50D	0.33	32		Semi-rigid, hydrophobic, good thermal resistance, low viscosity grade for capacitors and sensors.
13532	13400	100/25	black	1200	70	40D	0.38	7		Semi-rigid, hydrophobic, low-viscosity type, suitable for PCBA and small transformers.
13551	13425	100/16	white, black	2300	50	28D	0.57	-10	V0	Compliant with NF16-101 railways standard, UL listed, good resistance to severe thermal variation, good thermal conductivity, suitable for transformers and PCB.
13552	13500	100/16	white, black	4500	60	50D	0.57	11	V0	Compliant with NF16-101 railway standard, UL listed, semi-flexible, good thermal conductivity, suitable for transformers and sensors.
13553	13500	100/13	black	3000	35	50D	0.68	9	V0	Compliant with NF16-101 railways standard, UL listed, high thermal resistance (155°C) and thermal conductivity, suitable for transformers, PCBA and sensors.
13575	13500	100/23	black	2000	30	80D	0.75	54	V0	Low mix viscosity and short curing time, excellent thermal conductivity, suitable for transformers and small water pumps.
13653	13500	100/25	black	3000	90	75A	0.24	-68		Remain flexible at low temperature, very hydrophobic, high adhesion, suitable for PCBA, sensors and marine application.
13654	13654	100/11	beige	4000	60	25A	0.35	-53		Ultrasoft and very hydrophobic, suitable for sensitive electronic devices and components.
13658	13400	100/24	brown transparent	2400	100	50A	0.21	-62		Transparent, high dielectrical strength, very flexible, suitable for high-voltage device and PCBA protection.

Examples of applications include:

- » Low-voltage and electronic transformers
- » Capacitors and electrical filters
- » Coils and magnets
- » Sensors
- » Electronic assemblies PCB protection
- » Relays
- » Motors

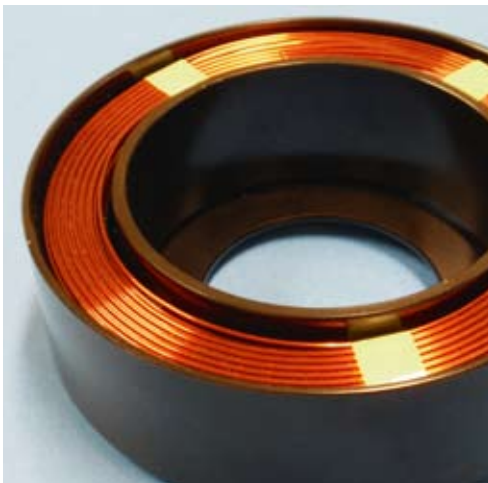
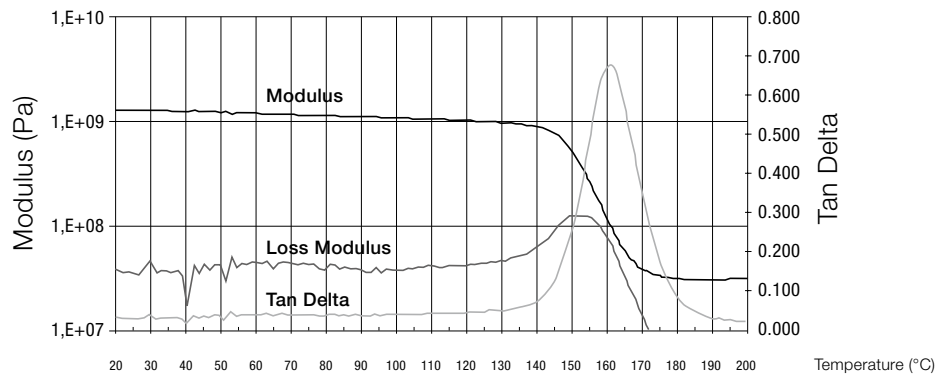
Epoxy DAMIVAL®

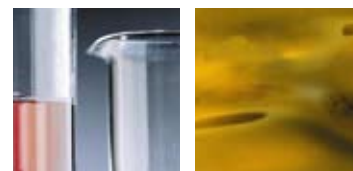
Epoxy systems include a resin and a specific hardener that must be blended together. Cold-curing resins are suitable up to class F (155°C) insulating systems. Hot-curing DAMIVAL® epoxies can be used in high-voltage applications as well as for impregnation of class H (180°C) coils and windings. They can be processed under vacuum to improve the penetration of the resin.

The main advantages of epoxy DAMIVAL® are:

- » Low viscosity, very fluid
- » High glass transition temperature
- » Dimensional stability at elevated temperatures
- » High thermal conductivity
- » Resistance to vibration and thermal shock
- » Outstanding adhesion
- » Thermal endurance up to 180°C
- » Resistance to moisture and water

The 160°C Glass Transition Temperature of DAMIVAL 15242 provides stable mechanical properties even at high temperatures





The following table shows the comparative values for different references of DAMIVAL® epoxy resin:

Reference		Mix ratio	Color	Minimum curing	Mix viscosity	Gel time	Maximum operating temperature	Thermal conductivity	Glass transition	Main characteristics
Resin	Hardener	Weight		°C	MPa.s	Minutes		W/m.K	°C	
15174	15174	100/40	amber	25	800 at 25°C	300 at 25°C	155	0.17	56	very fluid, nonfilled type for filament winding process, suitable for bonding application.
15208	15208	60/100	brown	25	15000 at 25°C	200 at 25°C	155	0.58	57	good thermal resistance and conductivity, easy control of blend quality, suitable for mechanically and thermally stressed equipment.
15215	15215	100/30	black	25	500 at 25°C	15 at 25°C	155	0.32	58	UL94 V0, very low viscosity, highly reactive, used for bus bars and connectors.
15216	15216	100/10	black	25	3500 at 25°C	20 at 25°C	155	0.45	110	high Tg and reactivity, easily machinable, suitable for electrobrakes and coils.
15350	15210	100/13	black	25	2300 at 25°C	50 at 25°C	155	0.83	68	UL94V0, good resistance to moisture, high thermal conductivity, used for small transformers, pumps and sensors.
15225	15225	100/100	black	90	500 at 80°C	25 at 120°C	155	0.37	35	excellent resistance to thermal shocks, low viscosity for good impregnation, short curing cycle (2h at 120°C), suitable for electromagnet and stator casting.
15242	15242	100/12	black	100	1000 at 50°C	10 at 120°C	180	0.4	160	good resistance to thermal shocks, stable thermal expansion up to 150°C, suitable for special coil encapsulation and sensors.

DAMIVAL® epoxy resin is designed to efficiently integrate a number of fields of applications in the electronic, electrical, large-power-generator device, telecommunications, automotive, marine and railway industries.

Examples of applications include:

- » Transformers
- » Electromagnets
- » Aquarium pumps
- » Capacitors
- » Electrovalves
- » Connectors
- » Sensors
- » Low-voltage motors
- » Electrical brakes
- » Air core reactors

Within Von Roll, innovation in liquids is constantly ongoing and represents a genuinely collaborative enterprise involving a great deal of teamwork with internal and external partners. For further information please ask our engineers and experts for technical support and special requests.