

MARKETS // PRODUCTS

COATED MATERIALS

SELECTOR GUIDE

vonRoll

WE ENABLE ENERGY

Von Roll offers a great variety of insulation materials for the electrical and electronic markets to create the most reliable machines. For every application there is an ideal set of materials that form a fully compatible system. We also supply engineering application support and testing services to maximize production efficiency and optimize approval processes.

Von Roll is a global company with multiple manufacturing sites in most continents, allowing optimized regional support. Our coated materials line are composed of these varied constructions.

A VARIETY OF INSULATION SYSTEMS

- + **Coated glass cloth**
 - Fully cured
 - B-stage prepregs
- + **Coated daglass tapes**
 - Sealing tapes
 - Power cable splicing tapes
 - End-winding tapes
- + **Coated and oriented films**
 - Friction coated films
 - Shrink films
- + **Coated papers**
 - Rotor turn insulation
 - Slot consolidation
- + **Coatings for specialty applications**

COATED GLASS – CURED

Von Roll produces a wide range of impregnated glass cloth products for different applications and available cured or uncured. Alkyd polyesters, unsaturated polyesters, epoxies and silicones are included in the range. The glass cloth provides the physical strength and barrier properties while the resin imparts the flexibility for application and temperature performance in use. Used in many applications in motors, generators and transformers.

Product Name	General description	Composition	Thermal class
Fully Cured Products			
THERM-AL H® Series	THERM-AL H® is a series of polyester coated closed weave glass fabrics with 180°C thermal capability, good flexibility, tear strength, and exceptionally high tensile strength. THERM-AL H® is recommended for a wide variety of uses in the motor and transformer industry including phase separators, slot liners, barrier and layer insulation, bus bar, and coil wrapping, to name but a few. Available in thicknesses from 5 to 17 mils.	Tough conformable insulation for slots and endwindings	180°C
THERM-AL H® PST Series	Our THERM-AL H® series of cured polyester on glass cloth is available with adhesive one side.	Tough conformable insulation for slots and endwindings	180°C
THERM-AL H® 2001 Series	Our THERM-AL H® series of cured polyester on glass cloth is available with adhesive one side and release liner.	Tough conformable insulation for slots and endwindings	180°C
FABRI-THERM® 76566	FABRI-THERM® 76566 is treated with ALKANEX polyester varnish. The varnished glass cloth offers outstanding thermal resistance combined with excellent electrical and physical properties and provides reliable insulation over a wide range of design and environmental conditions. Suggested in ground and phase insulation where a high degree of stiffness is required.	High degree of stiffness and strength for coil supports and spacing	180°C
FABRI-THERM® 76578	FABRI-THERM® 76578 is our ALKANEX treated glass cloth 76566 with an added friction coat on both sides. The varnished glass cloth offers outstanding thermal resistance combined with excellent electrical and physical properties and provides reliable insulation over a wide range of design and environmental conditions. Suggested in ground and phase insulation where a high degree of stiffness and friction coated surface is required.	High degree of stiffness and strength for coil supports and spacing	180°C
517-1403, 1405, 1407, 1410	517-1403, 1405, 1407 and 1410 are woven glass fabrics treated with a flexible epoxy resin. Material is valuable in liquid insulated equipment and in epoxy encapsulated units to ensure good bonding and compatibility.	Works well in liquid insulated equipment and epoxy encapsulated units	155°C
517-1419, 1427, 1429, 1430	517-1419, 1427, 1429, 1430 are straight woven glass fabric treated with a high temperature epoxy resin. The mechanical strength of the resin provides compression stability for rotor turn applications.	Works well in liquid insulated equipment and epoxy encapsulated units	155°C
FABRI-THERM® 76511 & A	FABRI-THERM® 76511 is a woven glass fabric treated with a fully cured silicone resin. It offers good dielectric strength and the excellent mechanical properties required for many high temperature applications. Available in 3 - 13 mil thickness. MIL-I-17205	High temperature applications with good resistance to oil, moisture and ozone. MIL-I-17205C	180°C

Product Name	General description	Composition	Thermal class
B-Stage Products			
FUSA-FAB® 76504 & P	FUSA-FAB® 76504 is a glass cloth coated with a semi-cured, low volatile, polyester resin to a 6 mil thickness. It provides an economical and uniform alternative to untreated fabric through reduced processing time and eliminating the need for multiple varnish dips. Provided with an interliner, the P version has no liner.	Rigid after curing, Easily machined, Highly resistant to attack by abrasion, moisture, oil and solvents	155°C
FUSA-FAB® 76003	FUSA-FAB® 76003 is a glass cloth coated with a semi-cured, low volatile, polyester resin to a 10 mil thickness. It provides an economical and uniform alternative to untreated fabric through reduced processing time and eliminating the need for multiple varnish dips. Provided with an interliner, the P version has no liner.	Rigid after curing, Easily machined, Highly resistant to attack by abrasion, moisture, oil and solvents	155°C
FUSA-FAB® 76590 & P	FUSA-FAB® 76590 is a glass cloth coated with a semi-cured, low volatile, polyester resin to a 6 mil thickness. It provides an economical and uniform alternative to untreated fabric through reduced processing time and eliminating the need for multiple varnish dips. The material comes with an interliner, the P version has no liner.	Rigid after curing, Easily machined, Highly resistant to attack by abrasion, moisture, oil and solvents	180°C
FUSA-FAB® 76591 & P	FUSA-FAB® 76591 is a glass cloth coated with a semi-cured, low volatile, polyester resin. It provides an economical and uniform alternative to untreated fabric through reduced processing time and eliminating the need for multiple varnish dips. The material comes with an interliner, the P version has no liner.	Rigid after curing, Easily machined, Highly resistant to attack by abrasion, moisture, oil and solvents	180°C
FUSA-FAB® 76591D	FUSA-FAB® 76591D is a double layer of glass cloth coated with a semi-cured, low volatile, polyester resin. The material comes with an interliner on each side of the fabric. It provides an economical and uniform alternative to untreated fabric through reduced processing time and eliminating the need for multiple varnish dips.	Rigid after curing, Easily machined, Highly resistant to attack by abrasion, moisture, oil and solvents	180°C
FUSA-FAB® 1510TX	FUSA-FAB® 1510TX is a high binder, B-stage epoxy resin-impregnated glass tape. It has a polyethylene separator for easier handling. It can be used in place of brushing resin to fill voids and irregularities in coils. Useful for slot consolidation in form wound coils.	Replaces brushing resin, b-staged epoxy resin impregnated glass	180°C
FUSA-FAB® 76477	FUSA-FAB® 76477 is a B-stage epoxy resin-impregnated glass tape. It has a polyethylene separator for easier handling. It can be used to insulate bolts and other connectors or stacked and pressed to make thick composites.	Used for thick composites, b-staged epoxy resin impregnated glass	180°C
FUSA-FAB® 710-023	FUSA-FAB® 710-023 is a "b-staged" epoxy coated fiberglass. The flexibility and slight tackiness of the "b-staged" resin permits easy taping that stays in place. When cured, a tough rigid structure is produced which provides excellent mechanical protection and a sealed insulation, which prevents the entrance of moisture and other contaminants.	Forms rigid structure, Moisture and chemical barrier	155°C

Product Name	General description	Composition	Thermal class
B-Stage Products			
Actoglass 710-029	Actoglass 710-029 is a fiberglass coated with a thermosetting epoxy resin that is flame retardant. The flexibility and slight tackiness of the epoxy "B-staged" resin permits easy taping that stays in place. When cured, a tough rigid structure is produced which provides excellent mechanical protection and a sealed insulation, which prevents the entrance of moisture and other contaminants.	Flame retardant, B-staged epoxy coated glass, Cures to tough rigid structure	155°C
FABRI-THERM® 76585	76585 tape is a B-staged silicone rubber coated on both sides of a silicone impregnated and cured glass cloth. There is no separator film in the tape. 76585 can be used in turn to turn insulation of alternator stator coils or traction motor field coils and other application requiring high temperature, bondable insulation.	High temperature, Silicone, B-staged	220°C
FABRI-THERM® A2440	FABRI-THERM® A2440 is a B-staged silicone rubber on one side of glass cloth. This tape has a thermal rating of 220°C and is designed especially for high performance demands of the transportation industry. When properly applied and cured, it affords a very reliable, durable, and flexible insulation system capable of withstanding extreme thermal and mechanical shock situations.	Excellent for transportation industry, durable, flexible, Withstands extreme thermal and mechanical shock	220°C



DAGLAS

Von Roll produces a wide range of impregnated daglas cloth products for different applications and available cured or uncured. The daglass cloth provides elongation of the tapes which vastly improves the conformability of a coated product and allows tighter taping and also some shrinking when heated. Our cured alkyd polyester or B-staged epoxies or polyesters impart the flexibility for application and temperature performance in use. Used in many applications in motors, transformers, power cables and bus bars.

Product Name	General description	Composition	Thermal class
Sealing and Endwinding Tapes			
515 SERIES, and PST	The 515 series is a polyester/glass straight weave fabric coated with high temperature flexible resin. Material has excellent flexibility and tear strength with good elongation and conformability. Available in 5.8 and 10 mil thicknesses. Pressure sensitive adhesive coated versions available as PST.	Excellent flexibility and tear strength, good elongation and conformability	155°C
FUSA-FLEX® 76593	FUSA-FLEX® 76593 is a B-staged epoxy-coated polyester-glass tape that fuses during cure to provide tough moisture and chemical seal. Insulation for coils can be easily flexed for winding even pounded and scuffed without breaking the seal. During the curing process the polyester warp threads shrink, pulling the tape down lightly to ensure a leak-proof seal without pressure.	Sealable armor tape, Modified epoxy coating, shrinks 3-5%	155°C
ARMORFLEX 770-0070	ARMORFLEX 770-0070 is a B-staged insulation consisting of a woven polyester fiberglass cloth impregnated with a tough thermosetting polyester resin. The improved flexibility of this polyester glass and the slight tackiness of the resin permit easy taping that stays in place. Additionally, the polyester glass shrinks upon curing to form a tough, conformable, leak-proof barrier.	Sealable armor tape, Tough polyester resin	155°C
Power Cable Tapes			
600 SERIES	The 600 series is a polyester/glass straight-weave fabric coated with a high temperature, high quality black polyester varnish. Material has exceptional flexibility and toughness, along with good elongation and conformability to shape. Available in 10 and 12 mil thicknesses.	Exceptional flexibility and toughness, good elongation and conformability to shape	155°C
601 SERIES	The 601 series is our 600 series with an additional slip coating on both sides that improves the tapability. When packed with mineral oil it becomes an excellent splicing tape for power cables. Available in 10 and 12 mil thicknesses.	Exceptional flexibility and toughness, good elongation and conformability to shape	155°C

COATED PAPERS

Von Roll produces a wide range of coated paper products many of which feature Nomex® brand aramid paper. Our specially designed coatings enhance the utility of the papers by adding increased strength or bonding capability. Our cured alkyd polyester or b-staged epoxies or polyesters impart the flexibility for application and temperature performance in use. Used in many applications in motors, transformers, power cables and buss bars.

Product Name	General description	Composition	Thermal class
ALM-X 5	ALM-X 5 is a fully cured coated Nomex® aramid mat containing no silicones with a thermal rating of 180°C. ALM-X 5 exhibits excellent conformability, improved moisture resistance and exceptionally high dielectric strength while maintaining the other desirable properties of the substrate. Used for ground and phase insulation in motors and transformers.	High dielectric strength, excellent tear strength, coated Nomex®	180°C
1605TX	1605TX is a premium grade electrical insulation consisting of an aramid fiber paper coated on both sides with a B-staged, thermosetting, filled epoxy resin system. Sticky epoxy adhesive stripes are applied to one side to aid in assembly. Rotor turn insulation requiring high pressure molding.	aramid paper, Epoxy B-staged resin, high pressure molding	180°C
76714	76714 is a premium grade electrical insulation consisting of an aramid fiber paper coated on both sides with a B-staged, thermosetting, filled epoxy resin system. Rotor turn insulation requiring high pressure molding.	aramid paper, Epoxy B-staged resin, high pressure molding	180°C
76711	76711 is a one sided phenolic adhesive coated aramid paper. The B-staged resin is designed for a rapid heat cure with high bond strength. It is compatible with all types of magnet wire and other motor insulation. Used to consolidate slots in form wound coils.	Phenolic adhesive, aramid paper for coil slot consolidation	180°C
76712	76712 is a two sided phenolic adhesive coated aramid paper. The B-staged resin is designed for a rapid heat cure with high bond strength. It is compatible with all types of magnet wire and other motor insulation. Used to consolidate slots in form wound coils.	Phenolic adhesive, aramid paper for coil slot consolidation	180°C



FRICTION FILMS

Friction coated films are various films coated on one or both sides with an opaque specially formulated non-abrasive resin system that imparts high friction, no slip characteristics to the coated surface. The friction coating allows for easier, more economical manufacturing operations. Friction coating, for example, keeps slot liners in position during coil winding and other manufacturing steps and prevents magnet wire from slipping on film surfaces during winding and cutting of stick wound transformer coils.

Product Name	General description	Composition	Thermal class
ACUFLEX® FCM, DFCEM	ACUFLEX® FCM products are polyester films coated on one or both sides with our high friction, no slip coating. Available on films from 1 to 10 mils thick.	No slip coating on polyester film	130°C
ACUFLEX® FCK, DFCK	ACUFLEX® FCK products are polyimide films coated on one or both sides with our high friction, no slip coating. Available on films from 1 to 5 mils thick.	No slip coating on polyimide film	220°C

SHRINK FILMS

ACUFLEX® heat shrinkable films are specially processed, post-oriented films designed to provide uniform, unidirectional shrinkage under heat. They are recommended for use during the initial construction and, later, the insulating stage of form wound coil production and leads. They are also suggested for use when curing glass banding tapes on armatures, commutators, and wherever a shrink film is required.

Product Name	General description	Composition	Thermal class
ACUFLEX® 76850	ACUFLEX® 76850 is a 6 % heat shrinkable polyester film tape. Moderate shrinkage percent suggested for use when curing glass banding tapes on armatures and commutators. Suitable for use wherever a shrink film is required.	6%, heat shrinkable unidirectional tape	NA
ACUFLEX® 76851	ACUFLEX® 76851 is a 12 % heat shrinkable polyester film tape. Standard shrinkage tape used commonly in resin rich coil consolidation. Suitable for use wherever a shrink film is required.	12%, heat shrinkable unidirectional tape	NA
ACUFLEX® 76855	ACUFLEX® 76855 is a 20 % heat shrinkable polyester film tape. High shrinkage tape used where the maximum force and shrinkage % is required. Used commonly in resin rich coil consolidation. Suitable for use wherever a high shrink film is required.	20%, heat shrinkable unidirectional tape	NA
ACUFLEX® 76856	ACUFLEX® 76856 is a shrink release laminate of oriented PET film and Tedlar® film. Excellent for consolidation of coils with resin rich technology.	Consolidation of resin rich prepregs and mica tapes	NA

COATINGS

Von Roll has developed many coating that can be used as special adders to the substrate of your choice. From low temperature curing epoxies suitable for curing in the field to pressure sensitive coating that assist in part assembly. A selection of our coatings is shown below.

Product Name	General description	Composition	Thermal class
Coating 6352	Coating 6352 is a dry to the touch, thermosetting, high temperature epoxy coating. Normally applied to both sides of Nomex® paper. The product is dry to the touch and has excellent storage stability. It is fused in place with the application of heat and moderate pressure to form a totally cured and bonded system providing a sealed insulation impermeable to moisture and other contaminants.	Sealed insulation system impermeable contaminants, High temperature epoxy resin system, Nomex	180°C
Coating 1812	Coating 1812 is a flexible B-stage epoxy coating applied to one or both sides of a substrate. Cures at low temperature and provides good bond to copper. Normally applied to Nomex® paper as transformer layer insulation.	Low temperature cure epoxy B stage coating. Layer Insulation. Nomex®	180°C
Coating 5001	Coating 5001 is a pressure sensitive curable epoxy adhesive protected by a release liner. Cures at low temperature and provides good bond to copper. Available on various substrates. Routinely applied to Acme Glass or Nomex® paper as rotor turn insulation in generators.	Low temperature cure epoxy adhesive, excellent adhesion to copper, rotor turn insulation.	155°C / 180°C
Coating 2003 & 2051	Coatings 2003 and 2051 are acrylic pressure sensitive adhesive applied to a variety of substrates. Supplied with a release liner.	Adhesive, aids in positioning insulating tapes and sheets	



TESTING



Materials and systems have to be tested in order to ensure the requested specifications concerning mechanical, electrical and thermal characteristics.

At Von Roll High-Voltage and Low-Voltage laboratories we are able to test our customers' materials and systems according to IEC, UL and other specifications.

- + Thermal, electrical and mechanical aging tests
- + Tan δ -measurements at different temperatures
- + Partial discharge measurements with different voltage ranges



TRAINING

For a number of years we have been offering a unique program of high-voltage and low-voltage insulation training within within our Von Roll Corporate University. The objectives of this program are:

- + Better understanding of high-voltage insulation technology for rotating machines and up-to-date knowledge on insulating materials and systems
- + Practical experience in the application of electrical insulating materials

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.



System components

Producer of integrated and ready-to-install system components for high-voltage electric motors, railway drives and generators.



Cables

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



Resins

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



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.



Flexibles

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



Ballistic Protection

High-quality systems for armored defense based on thermoset / thermoplastic products in single-use or tailored combinations.



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.

As one of Switzerland's longest-established industrial companies, Von Roll focuses on products and systems for electrical power generation, transmission, storage and industrial applications.

Von Roll's business portfolio is divided into the following businesses: Von Roll Insulation offers electrical insulation products, systems and services for generators, high- and low-voltage motors, transformers and other applications. Von Roll Composites produces composite materials and parts for a variety of industrial equipment.

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