

# Impregnating Resins for Electrical Applications

Your coils and our impregnating agents – a powerful combination. ELANTAS Europe offers a broad range of impregnating products for motors, generators and transformers. Optimal results are guaranteed due to our individual solutions and services.

## Impregnating Resins for Electrical Applications

Our product range covers impregnating resins and varnishes based upon epoxides and unsaturated polyesters / polyesterimides from our own production. This ensures our supply to be **independent** and guarantees you **optimal results**. Whether monomer free or with minimal draining losses, whether highly reactive or elastic – we offer you impregnation materials for all kind of requirements with our brands **Dobeckan®**, **Elan-protect®**, **EpoxyLite®**, **Elmotherm®** and **Aquanel®** for

- Trickle
- Dipping
- Hot-Dipping with/without UV-supported curing
- Impregnating by Vacuum (VI)
- Impregnating by Vacuum Pressure (VPI).



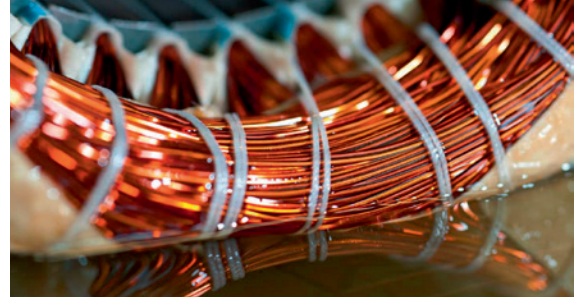
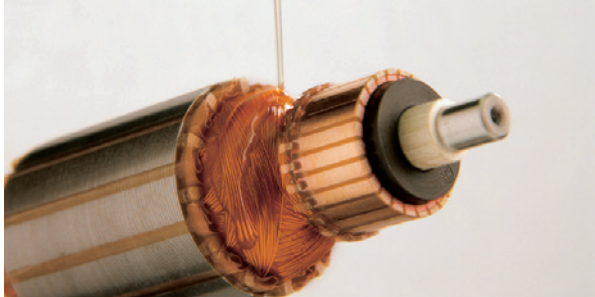
### **Innovation is our tradition**

It is our declared goal to deliver products which make the technology of tomorrow **more reliable, sustainable and safer** – already today. Due to a very close collaboration with our customers, our solutions are not limited to the impregnating material but they are holistically also including its production and application.

Innovation in all fields of our business does not end in itself for us. It is always being orientated to the requirements of our customers – and we measure our progress by our customers' **satisfaction**. ELANTAS Europe is running worldwide **research and application laboratories**. Thanks to our close contact to our customers and many years of experience as leading supplier of impregnation materials.

In our application laboratories we develop worldwide solutions for the challenges associated with the insulation of electrotechnical goods. And our team of **application specialists** ensures that these solutions will be perfectly implemented at your site. So we are contributing to the **reliability, long life and safety** of your products not only with our products but also with our technical application consulting service.





### Trickle Impregnation

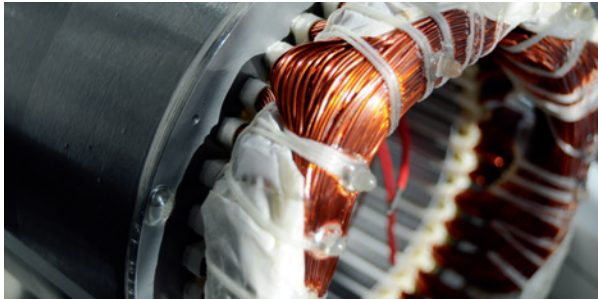
The Trickle Impregnation is used for the rapid processing of various wire wound components, including armatures, rotors and stators. It is suited to a continuous and high throughput production environment. The component to be impregnated is loaded on to a rotating fixture, which then advances through the whole impregnation cycle of pre-heat, impregnation, gelation, curing and cooling. Then the components return fully impregnated, with complete cured resin. This technique can be used to apply the resin directly on to the windings at pre-defined locations, using strategically positioned nozzles in the impregnation area.

### Roll Dip Impregnation

The Roll Dip Impregnation combines dipping with pre-heated and rotating components. The impregnating resin is stored in an open bath which is raised up to cover the rotating windings during the impregnation stage. The rotation of the component, in combination with the pre-heating, ensures good penetration and a high degree of resin uptake in the windings. This technique also ensures that any part of the rotating component that comes into contact with the bath is covered with a uniform resin film.

Product	Viscosity	Temperature Index	Typical Cure Schedule	Description (Ex Website /2016)
Aquanel® 014-3997/40	35 – 45 s B2 Cup 21 °C	180	3 h / 160 °C	Single component, solventless emulsion, zero VOC, high bond strength, high chemical and moisture resistance, for the impregnation of stators, rotors and small transformers. For dip, hot dip and dip-roll application
Dobeckan® FT 1040/120	115 – 135 mPa.s 23 °C	180	30 min / 130 °C or 15 min / 140 °C	Two component, UL recognised, unsaturated polyester-imide resin, contains styrene, tough-hard material, for household machines and magnet wheels. For trickle application.
Dobeckan® FT 1080/...	115 – 135 or 450 – 550 mPa.s 23 °C	200	30 min / 130 °C or 15 min / 140 °C	Two component, UL recognised, unsaturated polyester-imide resin, contains styrene, high bond strength, for processing of armatures and rotors. For trickle application.
Dobeckan® T 2001/...	115 – 135 or 470 – 520 mPa.s 23 °C	180	45 min / 130 °C or 15 min / 150 °C	Two component, UL recognised, unsaturated polyester-imide resin, contains styrene, excellent bond strength, for high speed power tools, starter motors and dynamos. For trickle application.
Dobeckan® FT 2002/...EK	6500 – 7500 mPa.s 23 °C	180	2 h / 150 °C	Single component, UL recognised, unsaturated polyester resin, monomer and VOC free, medium viscosity, environmentally compatible. For hot dip trickle and dip-roll application.
Dobeckan® MF 8005	850 – 1150 mPa.s 23 °C	180	30 min / 150 °C or 15 min / 160 °C	Single component, UL recognised, unsaturated polyester resin, monomer and VOC free, low viscosity, environmentally compatible, high reactivity, stable, for small and medium size motors. For dip, trickle and dip-roll application.
Dobeckan® 3820-150	140 – 160 mPa.s 23 °C	180	1 h / 140°C or 30 min / 160° C	Two component, unsaturated polyester resin, contains acrylate, high reactivity, for small to medium size automotive alternators. For trickle and dip-roll application.
ELAN-protect® EP 101#	400 – 2500 mPa.s 25 °C	180	3 h / 165 °C	Single component, UL recognised, epoxy resin, low viscosity, excellent moisture and chemical resistance. Suitable for low voltage electric motor stators. For dip, hot dip, dip-roll and trickle application.
ELAN-protect® UP 142	900 – 1500 mPa. 23 °C	180	1 h / 150°C or 30 mins / 160 °C	Single component, UL recognised, unsaturated polyester-imide resin, low viscosity, VOC free, high bond strength, quick surface drying, stable, for stators and rotors. For dip, hot dip, trickle and dip-roll application.

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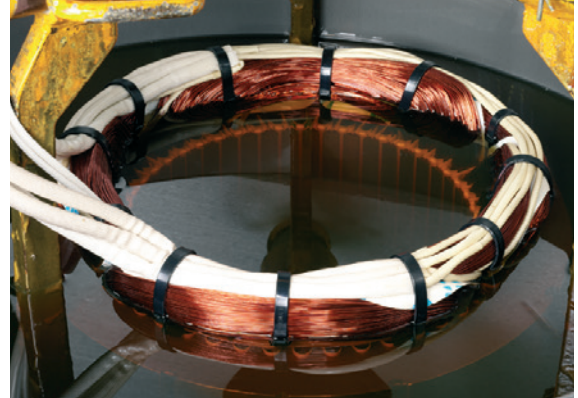
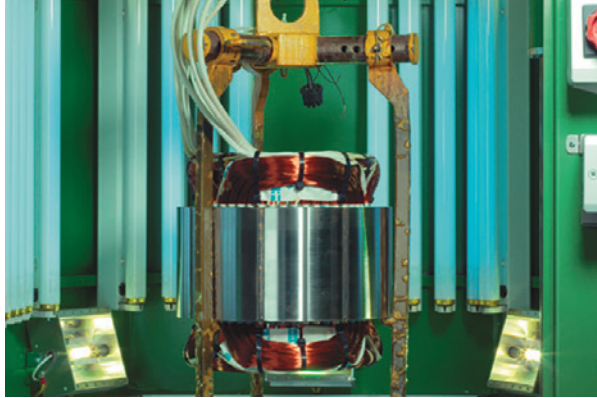


### Dip & Hot Dip Impregnation

The Dip Impregnation is a simple method of impregnation and is used for all types of wire wound electrical components. Here the component is dipped into the impregnation material until it is fully immersed. Air in the component is displaced by the impregnating material and the component is then removed to drain; this is followed by a curing process in an oven. The component can be pre-heated before dipping if a hot dip process is required. This technique has the advantage of faster penetration, better filling content and control of the process.

Product	Viscosity	Temperature Index	Typical Cure Schedule	Description (Ex Website /2016)
Aquanel® VF111##	30 – 60 s ISO Cup 6 mm 25 °C	180	3h / 130 °C	Water-based varnish, UL recognised, low temperature curing, solvent free, for the general impregnation of electrical windings. For dip and hot dip application.
Aquanel® 014-3997/40	35 – 45 s B2 Cup 21 °C	180	3 h / 160 °C	Single component, solventless emulsion, zero VOC, high bond strength, high chemical and moisture resistance, for the impregnation of stators, rotors and small transformers. For dip, hot dip and dip-roll application
Dobeckan® FT 1052/...EK	100 – 110 s ISO Cup 4 mm 23°C	180	1 h / 150 °C	Single component, UL recognised, polyester-imide resin, contains styrene, little secondary drainage, high filling ability, for processing of motors, generators and transformers. For dip and dip-roll application.
Dobeckan® FT 2015/...EK	90 – 120 s ISO Cup 4 mm 23 °C	200	1 h / 150 °C	Single component, UL recognised, polyester-imide resin, contains vinyl toluene, little secondary drainage, high filling ability, excellent thermomechanical strength. For processing of motors, generators and transformers. For dip, dip-roll, VI and VPI application.
Dobeckan® 825034	150 – 200 s Ford 4 Cup 25 °C	180	2 h / 150 °C	Single component, UL recognised, polyester resin, low viscosity, low emission, flexible and resilient, suitable for stators, transformers and general purpose use. For dip application.
ELAN-protect® UP 142	900 – 1500 mPa.s 23 °C	180	1 h / 150 °C or 30 mins / 160 °C	Single component, UL recognised, unsaturated polyester-imide resin, low viscosity, VOC free, high bond strength, quick surface drying, stable, for stators and rotors. For dip, hot dip, trickle and dip-roll application.
ELAN-protect® UP 343	4500 – 5500 mPa.s 23 °C	200	2 h / 150 °C	Single component, UL recognised, polyester-imide resin, crack-free curing in thick layers, excellent penetration capacity, high elasticity, for stators and transformers. For hot dip application.
ELAN-protect® EP 101#	400 – 2500 mPa.s 25 °C	180	3 h / 165 °C	Single component, UL recognised, epoxy resin, low viscosity, excellent moisture and chemical resistance. Suitable for low voltage electric motor stators. For dip, hot dip, dip-roll and trickle application.
Elmotherm® 073-1010	C135 – 165 s B4 Cup 21 °C	200	6 h / 130 °C or 2 h / 180 °C	Solvented varnish, high build, excellent stability. Tough and resilient with excellent chemical resistance. Used by OEM's and repairers for electric motor stators and transformers. For dip and hot dip application.
Elmotherm® UF 92 (N)	42 – 52 s ISO Cup 6 mm 23 °C	180	6 h / 130 °C or 4 h / 120 °C + 4 h / 150 °C	Solvented impregnating varnish, UL recognised, without aromatic and halogenic components, elastic, resistant to lowest temperatures, for generators and drives in mining and shipbuilding. For dip and hot dip application.
Elmotherm® VF 970	60 – 90 s ISO Cup 6 mm 25 °C	200	6 h / 130 °C or 3 h / 150 °C	Solvented varnish, high bond strength, excellent moisture, chemical and Freon resistance. Designed for impregnation of rotating electrical equipment. For dip and hot dip application.
EpoxyLite® H 1009 #	1000 – 3500 mPa.s 25 °C	180	6 h / 130 °C or 3 h / 165 °C	Single component, epoxy resin, mechanically tough and resilient, excellent chemical and moisture resistance. Suitable for low voltage electric motors, coils and transformers. For dip, hot dip, VI and VPI application.

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### Hot Dip with UV-supported curing

Hot Dip UV Impregnation is used for the processing of wire wound stators. With this process it is possible to achieve a complete filling content of the windings with fast cycle times. Current heating is used to pre-heat the component, which is subsequently dipped into the resin. Direct heating of the windings allows for excellent, rapid penetration and gelation. The component is removed and drained and this is followed by a curing process using current heating supported by UV radiation.

Product	Viscosity	Temperature Index	Typical Cure Schedule	Description (Ex Website /2016)
Dobeckan® FT2006-350 UV	340 – 380 mPa.s 23 °C	200	30 mins / 150 °C + 10 mins / 150 °C UV	Single component, UL recognised, unsaturated polyester-imide resin, contains styrene, high elasticity and excellent thermal durability. For hot dip UV application of stators.
Dobeckan® MF 8001 UV2	8000 – 1000 mPa.s 23 °C	180	45 mins / 150 °C + 15 mins / 150 °C UV	Single component, UL recognised, unsaturated polyester-imide resin, stable, monomer and VOC free, environmentally compatible, good mechanical properties and excellent thermal durability. For hot dip UV application of stators.
Dobeckan® MF 8004 UV	10000 – 12000 mPa.s 23 °C	180	45 mins / 150 °C + 15 mins / 150 °C UV	Single component, UL recognised, unsaturated polyester-imide resin, stable, monomer and VOC free, environmentally compatible, high bond strength and excellent thermal durability. For hot dip UV application of stators.
Dobeckan® MF 8044 UV	6500 - 7500 mPa.s 23 °C	180	30 mins / 150 °C + 15 mins / 150 °C UV	Single component, UL recognised, unsaturated polyester-imide resin, stable, monomer and VOC free, environmentally compatible, high bond strength and excellent thermal durability. For hot dip UV application of stators.
ELAN-protect®	900 – 1500 mPa.s 23 °C	180	15 mins / 140 °C + 15 mins / 160 °C UV	Single component, UL recognised, unsaturated polyester-imide resin, low viscosity, VOC free, high bond strength, quick surface drying, stable, for stators. For hot dip UV application.

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### Vacuum Impregnation

The use of Vacuum or Vacuum Pressure Impregnation application techniques provides an optimum machine protection against all types of stress by using a correctly engineered combination of impregnating resin, insulation system and application process.

The application of resin / varnish products to electrical windings by use of Vacuum Impregnation over a conventional dip process, provides significant benefits for the protection of wound electrical equipment, such as stators, field coils and transformers. The removal of air content from a winding by the application of vacuum is designed to greatly reduce the void content of the finished winding thus extending the working life of a machine due to increased thermal dissipation as well as providing for improved mechanical properties.

The correct use of Vacuum Pressure Impregnation also permits global impregnation of rotating electrical machines with the correctly designed insulation systems up to at least 13.8 kV specifications.

Product	Viscosity	Temperature Index	Typical Cure Schedule	Description (Ex Website /2016)
Dobeckan® FT 2015/...EK	90 – 120 s ISO Cup 4 mm 23 °C	200	1 h / 150 °C	Single component, UL recognised, polyester-imide resin, contains vinyl toluene, little secondary drainage, high filling ability, excellent thermomechanical strength. For processing of motors, generators and transformers. For dip, dip-roll, VI and VPI application.
Dobeckan® ST NV 075-4475	850 – 1150 mPa.s 23 °C	180	2 – 3 h / 130 °C	Single component, acrylated unsaturated polyester-imide resin, high thermal stability, for processing of traction armatures and field coils. For VPI application.
ELAN-protect® EP 420	650 – 800 mPa.s 25 °C	180	6 – 12 h / 165 °C	Single component, UL recognised, epoxy based resin, low VOC, low viscosity, for processing of low, medium and high voltage machines. For VPI application.
EpoxyLite® EIP 4526	190 – 210 mPa.s 25 °C	180	6 h / 165 °C	Single component, epoxy resin, low stress, for processing of wound magnetic cores. For dip, hot dip, VI and VPI application.
EpoxyLite® H 1009 #	1000 – 3500 mPa.s 25 °C	180	6 h / 130 °C or	Single component, epoxy resin, mechanically tough and resilient, excellent chemical and moisture resistance. Suitable for low voltage electric motors, coils and transformers. For dip, hot dip, VI and VPI application.
EpoxyLite® TSA 220S	3300 – 5700 mPa.s 25 °C	220	12 h / 165 °C	Single component, modified epoxy resin, high thermal stability, excellent chemical and moisture resistance, for processing of traction armatures and field coils. For VPI application.
EpoxyLite® 578 EB #	3000 – 5000 mPa.s 25 °C	180	8 – 12 h / 165 °C	Single component, thixotropic epoxy resin, zero VOC, for general purpose applications. For VPI application.
EpoxyLite® 478	1700 – 2600 mPa.s 25 °C	180	6 h / 150 °C  3 h / 165 °C	Single component, UL recognised, modified epoxy resin, resilient, high chemical and moisture resistance. Suitable for transformers. For VI and VPI application.

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# Impregnating Resins for Electrical Applications

ELANTAS Europe with production sites in Germany and Italy is part of the division ELANTAS Electrical Insulation of the ALTANA group. As a leading manufacturer of insulating and protective materials for the electrical and electronics industry our portfolio includes wire enamels, impregnating resins and varnishes, casting and potting resins, electronic coatings, adhesives and flexible electrical insulation materials. In addition, we supply materials for other application areas such as special coatings, printed electronic products as well as tooling and composite materials.

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