

Motor and Generator Casting

Casting as an alternative to impregnation

Due to growing environmental and technical requirements, the casting process tends to compete more and more with impregnation.

In automotive e-drives, wind turbine generators, traction motors as well as in high-voltage industrial drives, the protection of windings or even complete encapsulation become a must!

We offer casting resins that are able to fulfill:

Strong global environmental requirements: “Safe, green and clean,” such as

- No emission of VOC (volatile organic compound) particles
- No smell → Worker- and environment-friendly
- High flash point → no ATEX¹⁾ issues (no explosion risk)
- No chemical waste → Clean process
- CMR²⁾-free solution → Fully in line with REACH regulation



Technical concerns: “Void and PD (partial discharge) free solution”

- Excellent chemical protection, especially needed in harsh environmental conditions, such as in offshore, oil & gas and automotive applications
- High thermal conductivity → Long lifetime
- Outstanding mechanical properties → Vibration resistance
- Void-free → Partial discharge-free systems
- Flame-retardant → Onboard applications (traction, automotive, marine...)



Cost-effectiveness: “Total cost effective”

- Low-temperature cure → Lower energy demand
- No explosion risk → No ATEX¹⁾ requirements
- No waste → No waste treatment cost and associated issues
- No storage or transport safety issues → Lower cost
- Small line easy to integrate in the process flow → Lean manufacturing







1) Explosion risk regulation

2) Carcinogenic, mutagenic or reproductively toxic

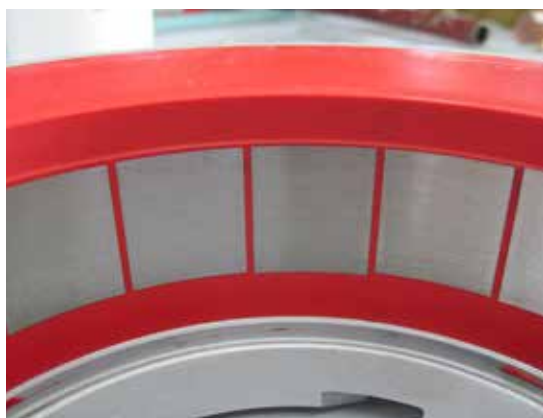
Replace impregnation by polyurethane

Polyurethane (incl. polybutadiene) resins are cured at room temperature and mainly used for high-humidity protection in applications such as pumps, coils or even immersed applications resistant to medium temperature (class B 130°C to class F 155°C max).

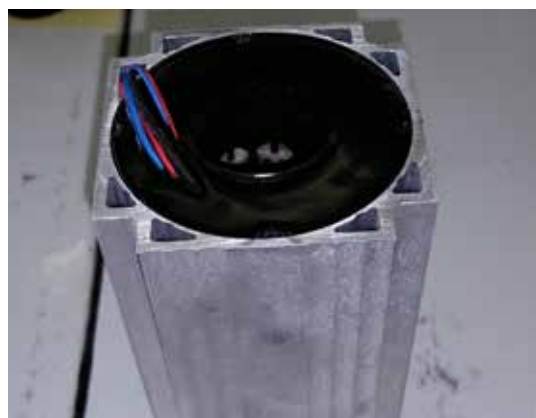
The Von Roll/Dolph's resin range selection, presented in the following table, combines safe handling and outstanding performance.

Reference	Viscosity @25°C (mPa.s)	Hardness	Thermal conductivity (W/m.K)	Homologation	Main properties
Damival® 13518	2 000	D85	0.65	 94 V0, EN45545HL2, R22,23,24 RTI 120°C	High glass transition temperature resin with outstanding homologation for universal applications.
Damival® 13554	1 400	D35 - A85	0.80	 94 V0	Low-viscosity flexible resin. Universal. Good thermal conductivity. Highly cost-effective.
Dolph® C(a)-1138	2 300	D40	0.60	 94 V0, UL file DV-155J	Universal flexible resin belonging to UL electrical systems.
Dolph® C(a)-1128	100 000 T ³⁾	A45	0.35	End winding protection	Highly flexible polybutadiene with outstanding chemical protection. Can be sprayed.
Damival® 13682	5 000	A46	0.95	 EN45545 - HL3, R22,23,24 UL 94 V0	Highly flexible polybutadiene CMR-free hardener. High temperature resistance (150°C) and thermal conductivity. Outstanding water and chemical resistance.

3) meaning Thixotrop



Polyurethane resins are suited for permanent magnets



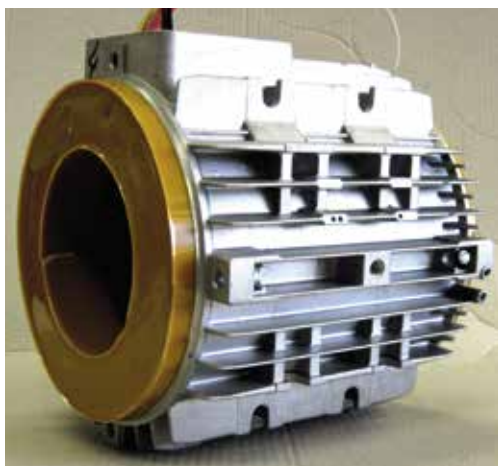
Servo motor casting

Replace impregnation by epoxy

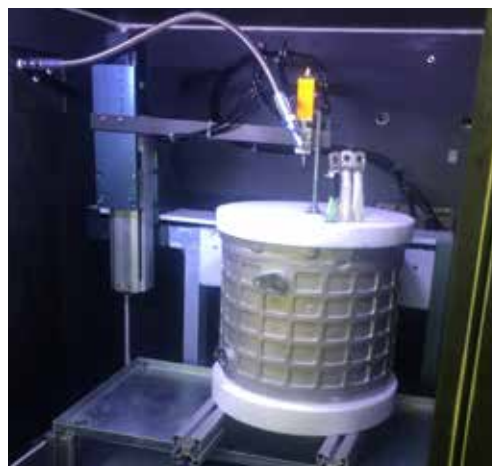
Epoxy (cold- and hot-curing) resins are mainly used for high chemical resistance under harsh environmental conditions. For example, offshore platforms, oil & gas, railway, wind turbine and automotive applications need to be resistant to high temperature, including class H+ 180°C.

The Von Roll/Dolph's range, shown in the following table, represents a selection of cold- and hot-curing resins combining safe handling and outstanding results.

Reference	Viscosity (mPa.s)	Hardness	Thermal conductivity (W/m.K)	Homologation	Main properties
Dolphon® C(a)-1114	1 000 @ 50°C	85	0.85	 UL 94 V0 EN 45545-2	Cold-curing universal casting resin available in different colors and packing sizes.
Dolphon® C(a)-1123	1 500 @ 50°C	85	1.4	Meets UL 94 V0	Cold-curing high thermal conductivity resin
Damival® 15350 FL	1 000 @ 50°C	50	0.75	 1446, class H Meets UL 94 V0	Cold-curing flexible high thermal shock-resistant resin: -60°C/+240°C.
Damival® 15225	500 @ 80°C	75	0.45	 1446, class H	Hot-curing, flexible and thermal shock-resistant resin Low viscosity for easy application
Dolphon® C(a)-1037	2 000 @ 80°C	85	0.80	Class H IEC 85 Meets UL 94 HB	Hot-curing, high Tg and high thermal shock-resistant resin: -60°C/+240°C Excellent mechanical properties
Dolphon® PDR-2200	800 @ 80°C	85	1.3	Class H IEC 85 Meets UL 94 HB	Hot-curing, high Tg and high thermal shock-resistant resin: -60°C/+240°C Very low coefficient of thermal expansion



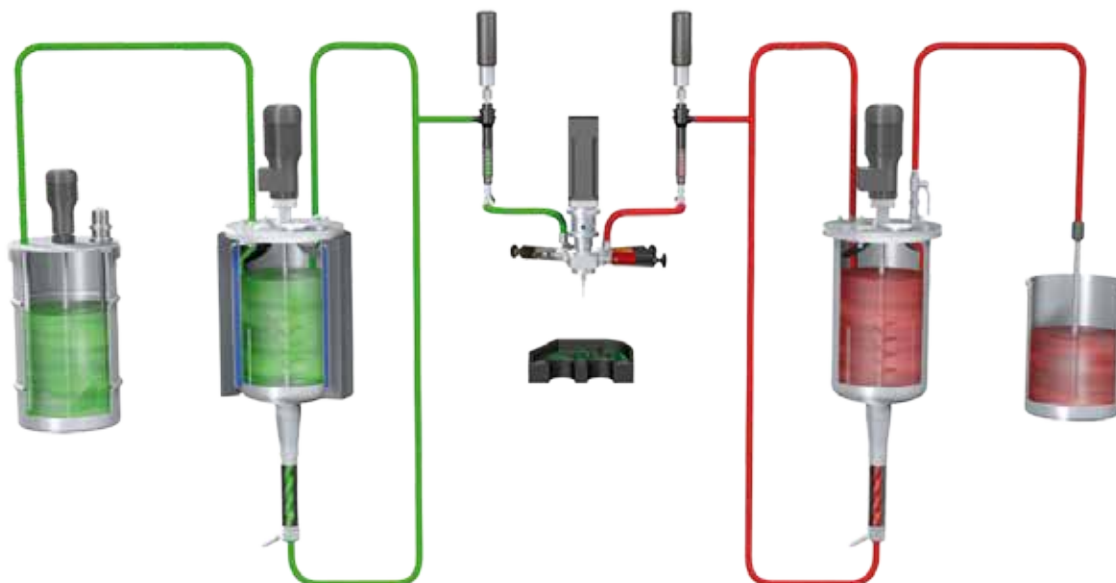
Casted stator



Electric drive casting equipment

Replace impregnation by casting

Potting compounds are applied on different manual or automatic dispensing machines with static or dynamic mixers. The process is always a strong key success factor. We recommend contacting our local technical managers in order to optimize the best choice of resin for the equipment parameters.



Dispensing machine from BD Tronic, Germany

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