

SHRINK FIXING TUBES

SOLUTION FOR FIXING AND FOR PROTECTION AGAINST THE CORROSION OF PERMANENT MAGNETS NEI MOTORI BLDC BRUSHLESS (SPM)



BLDC brushless motors have experienced exponential development in the world of electric motors in recent years thanks to the many advantages, including smaller dimensions with the same torque, a reduction in electrical consumption, higher speeds, lower maintenance and lower heat dissipation and can be overloaded.

One of the main critical issues of these SPM (Surface Permanent Magnets) motors is attributable to the complexity of anchoring of the magnets on the rotor and the fragility of the magnets themselves; these latter cannot be welded onto the rotor because at high temperatures the permanent magnets demonstrate an irreversible loss of magnetic flux.

REVOLUTIONARY SOLUTION COVERED BY EUROPEAN INDUSTRIAL PATENT NR. EP 2763283 B1

To avoid this problem, **Politubes** patented **SHRINK FIXING TUBES** in collaboration with DuPont Teijin

Films: a special spiral heat-shrinkable polyester tube (Mylar® HS) which makes the anchoring of permanent magnets automated, thus reducing the cost of assembling these motors.

The spiral tube is fitted on the rotor with the magnets in position and instantly heat-shrunk offering:

1. Marked cohesion of the rotor magnets.
2. The protection of magnets from scratches, rubbing and polluting agents.
3. No danger of cracking or damage to the delicate permanent magnets during the assembly process.

The temperatures and the short times to obtain heat-shrinking do not represent any danger of reducing the magnetic flux of the magnets themselves.

Other important advantages offered by the **SHRINK FIXING TUBES**:

- Unlike very expensive steel rings, the heat shrink spiral wound tube also wraps and protects the edges of the magnets, which are also subject to corrosion and which, if chipped, could cause seizure of the motor itself.
- The trimmings that often need to be performed during the assembly process are avoided if rigid rings are used; the Politubes spiral tube adheres without any force to the magnets, assuming their shape and avoiding cracks or scratches on the magnets themselves; this also means a perfect balance of the rotor itself.
- A part of the assembly is removed as possible expensive and often manual windings based on epoxy resins can be eliminated; with our tubes the lengthy activation times of the resins are therefore avoided in the oven, increasing productivity and reducing hidden production costs.

- The tubes can be used very well in combination with the epoxy adhesives used to fix the magnets, ensuring further protection both against the potential failure of the glue with detachment of the magnets, and against scratches or other contaminating agents.
- Minimum footprint of between 0.12 and 0.25 mm; this avoids any reduction of the magnetic flow inside the rotor, allowing the magnets to achieve their full potential.

In motors which use ring magnets obtained by compression in molds of Neodymium Iron Boron Nd-Fe-B magnets with the addition of thermosetting resins (plastoferrite), our tube also protects the magnet against corrosion given the delicacy of the alloys used avoiding seizure.

The heat-shrinkable polyester tube is used for temperatures with peaks of up to 155°C.

The adhesives, carefully selected during our forty years of experience, comply with all REACH and RoHS regulations and guarantee complete preservation of the original properties of the films used.

Politubes' R&D department remains available to listen to your needs and to design together innovative tailor-made solutions.

Advantages obtained with the Politubes tubular Mylar® HS for permanent magnets

- Affordability
- Reliability over time
- Simplicity of assembly
- Preservation of properties from -40°C to +155°C
- Design improvement
- Automation of production cycles
- Visual check ensured by the transparency of the tube
- European Patent Nr. EP 2763283 B1



DuPont Teijin Films™
A NEW WORLD IN POLYESTER FILMS

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