



SAVER



SAVER S.p.A.

DESIGN AND PRODUCTION
OF COMPOSITE MATERIALS FOR
CHALLENGING APPLICATIONS
IN STRATEGIC MARKETS



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Company's History and Mission

For more than 30 years **Saver** has been a symbol of excellence, quality and competence in the field of composite materials and filament wound tubes. Today Saver is a privately owned company completely independent in terms of capital, know-how and technology. Its organisation consists of around 100 people situated in plants and subsidiaries in Italy and Germany.

It is **Saver's** mission

"To design and produce composite materials for challenging applications in strategic markets".

To maintain global leadership in the production of advanced composites **Saver** follows the specific customer requirements concerning technological development, competitiveness, flexibility and reliability.

Saver is compliant with its own ethical code in the creation and conduct of long-term relationships with all customers, suppliers and partners. Respect for the individual, the law and the environment, the preservation of its own patrimonial and intellectual independence as well as accurate investment policies for the development of human capital, technologies, products and markets is an important and



Plant of Tribiano (Milan)



Some composite insulators in Saver HV Division

integrated part of the company's philosophy. ■


Products and Technologies

Saver is not only a supplier of strategic products but also a long-term partner for the development of technological solutions through quality excellence and continued improvement of raw materials, processes, machinery and human resources.

For the production of reinforced epoxy tubes it can be chosen among three technologies:

- Wet-winding of glass and polyester fibres
- Dry-winding of glass, polyester and aramid fibres vacuum-impregnated
- Dry-winding of glass, aramid and hybrid fabrics vacuum-impregnated

On the basis of a wide variety of resin formulations from 120° C up to more than 300° C tg, numerous customer requests in high-voltage as well as medium and low voltage applications, in automotive industry, machine construction and railways can be satisfied.



Vacuum-impregnated filament wound tubes for HV applications



Starting from our long experience with wet-wound glass epoxy tubes also for composite insulators since 2007 we have included the silicon moulding, producing complete:

- Hollow Composite Insulators

for HV applications which comply with the requirements of IEC 61462. Saver's technical departments are equipped with CAD software for 2D and 3D design, dimensioning and for FEM electrical simulation analysis which allow our customers to find the most highly stressed areas in the insulator and in its materials. ■

Hollow composite insulators



Varnished filament wound tubes

Equipment

Saver is equipped with state-of-the-art machinery which ensures high process reliability, best quality of all manufactured products and price efficiency. For the production of wet-wound and vacuum-impregnated tubes as well as composite insulators Saver is equipped, amongst others, with:

- 35,000 mandrels in a diameter range from 6 to 1000 mm and lengths up to 8000 mm
- 14 winding machines
- Several vacuum chambers
- 13 parallel and CNC lathes
- 5 clamping machines for silicon injection moulding
- Numerous moulds for siliconisation
- 3D coordinate measuring machine
- Machines for tightness and pressure tests

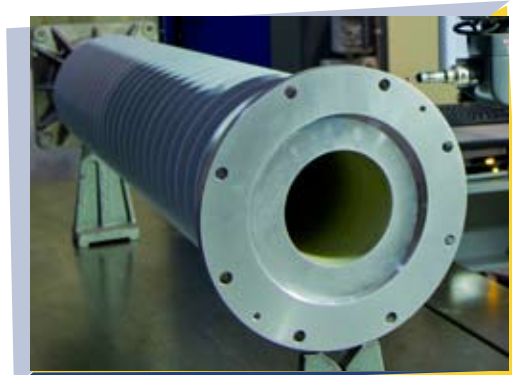
The variety and multiplicity of our equipment enables us to find customised solutions and it allows the flexibility to satisfy short-term customer needs. Saver is also equipped with several control and testing devices to ensure reliability and constant quality. ■



**Saver HV Division
- Moulding department**



Filament winding process close-up



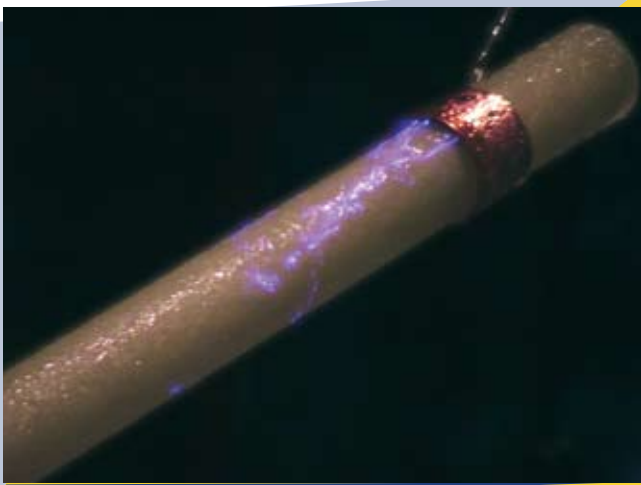
**3D coordinate measuring machine -
hollow composite insulator being measured**

Quality Management and Supervisory

All Saver production sites are certified in accordance with ISO 9001 and the plant dedicated for automotive products is certified to the even more stringent ISO TS 16949. This ensures procedures and consequently products on a high-quality and stable level. In addition we have installed a supervisory system called SCADA (supervisory control and data acquisition) which monitors each key parameter in production. It is able to carry out real time and remote checking and it compares deviations, historical values and results in tendencies. ■



SCADA system remote checking of moulding parameters



Electrical test of insulating stick for HV applications

Internal laboratory of Saver



customers

Saver's customers are mainly involved in electro-technical applications but also in the automotive industry, machine construction and railways. Worldwide acting global players such as

- ABB
- Alstom
- Siemens
- Bosch
- Hitachi
- Deutsche Bahn

but also medium-sized companies like Maxwell Technologies, Catu Electric, Pfisterer, Mersen, Haulotte, Dautel and many others rely on Saver's products and service. Customers around the world underline the high export orientation and the confidence which Saver has established during the last 30 years. ■



Filament wound tubes - close-up



Rings for automotive industry (starter motors)



Self-lubricating maintenance free bearings-Durobearing™

Why Saver?

There are several positive aspects which result in our customers' benefits. Don't wait any longer to speak to and rely on us. The following benefits can also be yours:

Private Ownership and Independency

- Allows investments in machinery and tools for your needs
- Allows fast decisions to solve your problems and requirements
- Allows long-term cooperation and high reliability in all fields
- Serious consultancy which is not bound to short-term success but to sustainability

Research and Development

- Ensures high-quality and comprehensive advisory service by specialists
- Cooperation with universities ensures participation on latest developments
- Design and calculation according to your specific needs
- In-depth know-how to guarantee attractive and reliable tailor-made solutions
- Continuous training of staff to assist you with the most up-dated knowledge
- Equipment for design and type testing to accelerate necessary homologation processes

Machinery and Tools

- State-of-the-art equipment to ensure best quality at competitive prices and high-process reliability
- 14 winding machines
- 35,000 - already available and always growing - mandrels to follow your short-term tube and insulator requests
- 5 clamping machines and numerous moulds for high flexibility of your demands in composite insulators
- Several vacuum chambers to ensure short lead times of your vacuum-impregnated tubes
- Comprehensive testing equipment to satisfy all your inspection requests
- Machinery for the entire product range of insulation materials enabling you to buy wet-wound tubes, vacuum-impregnated tubes and composite hollow insulators from one source. ■



Dry winding process - close-up



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