

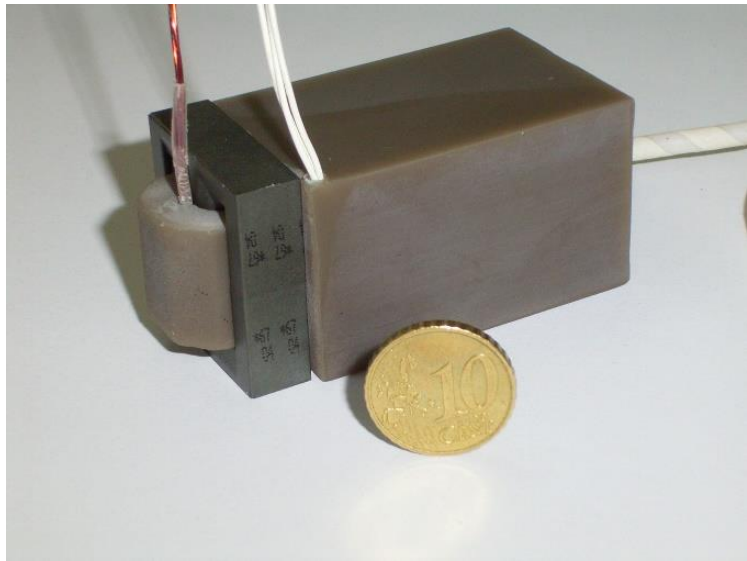
Category: Materials, Coatings & Processes

Reference: TD-DE-1025

High Voltage Casting Technology

TWTA-Travelling Wave Tube Amplifiers are broadband high frequency-amplifier. Main application are communication satellites where they enable space data communication. TWTA consist of a high voltage supply unit (Electronic Power Conditioner EPC) and a Travelling Wave Tube. The development and production of high voltage systems launched in space applications require a large dimensioned experience in design, machining and testing of high-class materials as well as knowledge concerning correct application of design rules to guarantee the requirements to low weight and high reliability of high voltage devices.

For enabling compact design of the high voltage section (low dimensions, volumes and mass) it will be entirely encapsulated by a solid state insulation material with a high value of dielectrical toughness. Beside the electric function the grouting has a function concerning the mechanical task of packaging and the mechanical installation of the high voltage section. For this purpose a high reliable epoxy resin system had been developed and qualified up to a nominal voltage of 30 kV.



It had been applied during various ESA- and commercial projects. Bubble-free grouting enables optimum electric and mechanical properties. The resin and the hardener will be subjected to a vacuum treatment in advance. The following grouting process takes place under vacuum conditions too. Mixing and dosage machines conduct resin and hardener into the vacuum casting chamber. Afterwards the casting will be hardened in an autoclave.

Innovative Aspects:

Special properties of the high voltage casting are:

- Low dimensions / weight of the casted high voltage modules
- Low outgassing
- High dielectrical toughness
- Low thermal expansion coefficient
- High thermal conductivity
- Good behaviour under partial pressure
- No ageing
- Broad thermal range

Application Areas:

Main fields of application are the production of:

- Insulators
- Distance pieces
- Feed troughs
- High tension coils
- Transformers (high- and low voltage)
- Packaging and insulation of high voltage components
- Transducer
- Sealing of any control units against environmental influence.

Following sectors may be interested in this technology:

- Automotive industry
- Electronic industry
- Aerospace
- Telecommunications

Cooperation:

The company is interested in cooperations and offers the service of casting of components.