



Licensing opportunity

Monitoring of water release during vacuum treatment of high power capacitors

Field of use

Technology Keywords:
High power capacitors
Erosion
Vacuum measurements

Current state of technology

Stage of development:
Already on the market

Patent status

secret know how

Publication

TBA

Developed by

Jožef Stefan Institute

Reference

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Background

A Slovenian research institute offers its expertise in monitoring of water release from polymer-metalized foils during vacuum heat treatment of high power capacitors. These measurements are essential during the R&D phase and quality control in production of high power capacitors before they are impregnated by special oils. High break-down voltage of a capacitor is required for a high quality device over a long life-time. The institute is offering service, commercial and license agreements.

Description of the Invention

The Slovenian research institute provides the expertise in the monitoring of small and slow water releasing in evacuated capacitors during the scheduled thermal procedure. The kinetics of water releasing must be depressed before filling with a special oil. Residual water, not expelled completely, slowly interacts with metalized foils and contributes the main part in deterioration and failure of capacitors much before desirable for customers. Besides the main task to expel most of the water, the drying process must proceed at conditions that are not harmful for metal parts as water vapour is aggressive at high temperatures.

The technical problem is solved by determination of the pressure rise (outgassing rate) of a material after a certain (thermal) treatment, this may also include determination of the gasses being evolved (using quadrupole mass spectrometry).

These measurements and know-how are crucial in the R&D phase and/or at the later quality control of small evacuated sealed devices whose functionality inherently relies in the low level of pressure. The techniques and skills are particularly suitable for developers and producers of vacuum devices. In high power capacitors, break-down voltage tests in vacuum can be applied to predict performance before filling with oil and when results are acceptable, a long-term performance can be estimated. The research team has decades of experiences in the research and development of various types of evacuated sealed devices along with skills in vacuum science and technology & materials science. Manufacturers of high power capacitors are sought for service agreements. The industrial partner is expected to describe his needs and requirements for vacuum characteristics measurements of their high power capacitors.

Manufacturers and research organizations that have R&D of high power capacitors are sought for commercial agreements with technical assistance. The partner is expected to apply the expertise in the monitoring of water release with the help of technical assistance. Manufacturers and research organizations that have R&D of high power capacitors are sought for license agreement. The partner is expected to

apply the expertise in the monitoring of water release without the help of technical assistance.

Main Advantages

For determination of the pressure rise only inert gauges are being used: spinning rotor gauge, capacitance manometers and quadruple mass spectrometer applied in a separate UHV chamber.

The method has several advantages:

- is highly sensible, thus enabling measurements on a roll of metalized foil
- compares speed and quantity of released gas from samples with different geometry (width and shape of the roll)
- provides relation dependence of gas release kinetics to temperature
- determines influence of pumping speed on gas release kinetics