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Electrical insulation systems (EIS) - Thermal evaluation of combined liquid and solid components -
Part 1: General requirements

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Electrical insulation systems (EIS) - Thermal evaluation of combined liquid and solid components - Part 1: General requirements

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IEC TS 62332-1 has been prepared by IEC technical committee 112: Evaluation and qualification of electrical insulating materials and systems. It is a Technical Specification.

This third edition cancels and replaces the second edition published in 2011. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) Modifications have been made based on an extensive test series conducted using this methodology based on the first edition. This included updating expected times and temperatures to use in order to get useful results, as well as making the range of equipment covered more broad. The method now covers electrotechnical devices using different sealing systems, as well as devices using enamel covered wires.

The text of this Technical Specification is based on the following documents:

Draft	Report on voting
112/716/DTS	112/723/RVDTS

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Technical Specification is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 62332 series, published under the general title *Electrical insulation systems (EIS) -Thermal evaluation of combined liquid and solid components*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,
– withdrawn, or
– revised.

INTRODUCTION

This document specifies a method for the thermal evaluation of electrical insulation systems (EISs) for electrotechnical products with combined liquid and solid components. This document covers general test requirements. It is intended that subsequent parts will cover specific product test requirements.

Prior to this document, the procedure for determining the thermal endurance of insulation systems for liquid-immersed products involved one of two processes: firstly, sealed-tube ageing and, secondly, ageing of full-scale models.

The ageing of full-scale models is impractical, especially for larger products, such as power transformers. Similarly, the use of sealed-tube ageing is not practical when testing components having drastically different thermal capabilities. For example, testing of a system with a solid material with an RTI of 200 °C with a liquid having a 130 °C thermal capability cannot be performed efficiently. Accelerated ageing temperatures which significantly age the liquid will result in extremely long ageing times for the solid. Accelerated ageing temperatures which significantly age the solid will result in extreme, or even hazardous, ageing of the liquid.

This document specifies an accelerated thermal ageing procedure and model that allows for the solid materials to be aged at temperatures separate from the liquid ageing temperatures, all in the same apparatus. The model acts more in the true-life ageing mode of insulation systems, where solid insulation near the active parts is exposed to much higher temperatures than the major volume of liquid in the equipment. The model contains all the primary EIS elements, and in relative component ratios which compare with actual electrotechnical products.

The model has a dual temperature capability that allows independent control of the temperatures of the solid and liquid components by the use of separate circuits. A detailed bibliography is provided.

Further useful information can be found in IEC 60076-6 [1], IEC 60076-7 [2], IEC 60076-14 [3], IEC 60641-2 [4], [5], [6], [7] and[8].