

**POWER TRANSFORMERS –
Design and application of liquid-immersed power transformers
using high- temperature insulation materials**

1 Scope

This part of IEC 60076 provides specification, design, testing and loading information for use by both the manufacturer and user of liquid-immersed power transformers employing either high-temperature insulation or combinations of high-temperature and conventional insulation.

It is applicable to:

- Power transformers designed in accordance with IEC 60076-1,
- Converter transformers designed to IEC 61378 series,
- Arc furnace transformers,

and covers the use of various liquid and solid insulation combinations.

Whilst standards for traction transformers fall under the authority of IEC technical committee 9, this part of IEC 60076, however, may be applicable as a guideline for the use for of high-temperature insulation materials in traction transformers.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60076-1: 1993 Power transformers –Part 1: General

IEC 60076-2, Power transformers –Part 2: Temperature rise

IEC 60076-3, Power transformers –Part 3: Insulation levels, dielectric tests and external clearances in air

IEC 60076-5, Power transformers –Part 5: Ability to withstand short-circuit

IEC 60076-7:2005, Power transformers –Part 7: Loading guide for oil-immersed power transformers

IEC 60085, Electrical insulation – Thermal evaluation and designation

IEC 60216-1, Electrical insulating materials – Properties of thermal endurance – Part 1: Ageing procedures and evaluation of test results

IEC 60296, Fluids for electro technical applications – Unused mineral insulating oils for transformers and switchgear

IEC 60317 (all parts), Specifications for particular types of winding wires

IEC 60554-3 (all parts), Specification for cellulosic papers for electrical purpose – Part 3: Specifications for individual materials

IEC 60641-3 (all parts), Pressboard and presspaper for electrical purpose – Part 3: Specifications for individual materials

IEC 60674-3 (all parts), Plastic films for electrical purpose – Part 3: Specifications for individual materials

IEC 60819-3 (all parts), Non-cellulosic papers for electrical purpose – Part 3: Specifications for individual materials

IEC 60836, Specifications for unused silicone insulating liquids for electrical purpose

IEC 60851-4, Winding wires – Test methods – Part 4: Chemical properties

IEC 60867, Insulating liquids - Specifications for unused liquids based on synthetic aromatic hydrocarbons

IEC 60893-3 (all parts), Insulating materials – Industrial rigid laminated sheets based on thermosetting resins for electrical purpose – Part 3: Specifications for individual materials

IEC 61099, Specifications for unused synthetic organic esters for electrical purposes

IEC 61100, Classification of insulating liquids according to fire-point and net calorific value

IEC 61212-3 (all parts), Insulating materials – Industrial rigid round laminated tubes and rods based on thermosetting resins for electrical purpose – Part 3: Specifications for individual materials

IEC 61378-1, Convertor transformers – Part 1: Transformers for industrial applications

IEC 61629-1, Aramid pressboard for electrical purposes – Part 1: Definitions designations and general requirements

ISO 2592, Determination of flash and fire points – Cleveland open cup method

ISO 2719, Determination of flash point – Pensky-Martens closed cup method