

# Australian/New Zealand Standard™

## Power transformers

### Part 3: Insulation levels, dielectric tests and external clearances in air (IEC 60076-3, Ed. 2 (2000) MOD)



### **AS/NZS 60076.3:2008**

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee EL-008, Power Transformers. It was approved on behalf of the Council of Standards Australia on 26 February 2008 and on behalf of the Council of Standards New Zealand on 17 March 2008.  
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The following are represented on Committee EL-008:

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Australian Greenhouse Office  
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Originated as AS 2374.3.0—1982 and as AS 2374.3.1—1992.  
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## PREFACE

This Standard was prepared by the Standards Australia/Standards New Zealand Committee EL-008, Power Transformers to supersede AS 2374.3.0—1982 and AS 2374.3.1—1992 six months after publication.

The objective of this Standard is to provide designers, suppliers, purchasers and users of oil-immersed power transformers with requirements for insulation levels, dielectric tests and minimum external clearances in air between live parts of bushings and to objects at earth potential.

This Standard is an adoption, with national modifications, and has been reproduced from IEC 60076-3, Ed.2 (2000) (including Corr 1:2000), *Power transformers—Part 3: Insulation levels, dielectric tests and external clearances in air*, and has been varied as indicated to take account of Australian and New Zealand conditions.

Variations to IEC 60076-3:2000 are indicated at the appropriate places throughout this Standard. Strikethrough (~~example~~) identifies IEC text, tables and figures which, for the purposes of this Australian/New Zealand Standard, are deleted. Where text, tables or figures are added, each is set in its proper place and identified by shading (example). Added figures are not themselves shaded, but are identified by a shaded border.

IEC 60076-3:2000 includes both European and North American practices. It is the tradition in Australia to follow European practice. Table 3 and Table 6 have been deleted as they indicate North American practices. References to these tables should be ignored.

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The terms 'normative' and 'informative' are used to define the application of the annex to which they apply. A normative annex is an integral part of a standard, whereas an informative annex is only for information and guidance.

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## INTRODUCTION

This part of IEC 60076 specifies the insulation requirements and the corresponding insulation tests with reference to specific windings and their terminals. It also recommends clearances in air between live parts of bushings on oil-immersed power transformers and to objects at earth potential (clause 16). Guidance can be obtained from IEC 60071.

The insulation levels and dielectric tests which are specified in clauses 4, 5, 6 and 7 in this standard apply to the internal insulation only. Whilst it is reasonable that the rated withstand voltage values which are specified for the internal insulation of the transformer should also be taken as a reference for its external insulation, this may not be true in all cases. A failure of the non-self-restoring internal insulation is catastrophic and normally leads to the transformer being out of service for a long period, while an external flashover may involve only a short interruption of service without causing lasting damage. Therefore, it may be that, for increased safety, higher test voltages are specified by the purchaser for the internal insulation of the transformer than for the external insulation of other components in the system. When such a distinction is made, the external clearances must be adjusted to fully cover the internal insulation test requirements.

## STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

**Australian/New Zealand Standard****Power transformers****Part 3: Insulation levels, dielectric tests and external clearances in air  
(IEC 60076-3, Ed. 2 (2000) MOD)**

Any table, figure or text of the international standard that is struck through is not part of this standard. Any Australian/New Zealand table, figure or text that is added is part of this standard and is identified by shading.

**1 Scope**

This International Standard applies to single-phase and three-phase oil-immersed power transformers (including auto-transformers), with the exception of certain small and special transformers, as defined in the scope of IEC 60076-1. It identifies transformer windings to their highest voltage for equipment  $U_m$  associated with their corresponding rated insulation levels and details the relevant applicable dielectric tests and minimum external clearances in air between live parts of bushings and to objects at earth potential.

For categories of power transformers and reactors which have their own IEC standards, this standard is applicable only to the extent in which it is specifically called up by cross reference in the other standards.

**2 Normative references**

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60076. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 60076 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

References to international standards that are struck through in this clause are replaced by references to Australian or Australian/New Zealand Standards that are listed immediately thereafter and identified by shading. Any Australian or Australian/New Zealand Standard that is identical to the International Standard it replaces is identified as such.

IEC 60050(421), *International Electrotechnical Vocabulary (IEV) – Chapter 421: Power transformers and reactors*

~~IEC 60060-1, High-voltage test techniques – Part 1: General definitions and test requirements~~

AS 1931.1, *High-voltage test techniques, Part 1: General definitions and test requirements* (identical to IEC 60060-1:1992)

~~IEC 60060-2, High-voltage test techniques – Part 2: Measuring systems~~

AS 1931.2, *High-voltage test techniques, Part 2: Measuring systems* (identical to IEC 60060-2:1994)

~~IEC 60071-1:1993, Insulation coordination – Part 1: Definitions, principles and rules~~