AS/NZS 60076.2:2013

Australian/New Zealand Standard™

Power transformers

Part 2: Temperature rise for liquid-immersed transformers (IEC 60076-2, Ed 3.0 (2011) MOD)

STANDARDS Australia

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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 27 September 2013 and on behalf of the Council of Standards New Zealand on 27 September 2013.
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Australasian Railway Association
Australian Chamber of Commerce and Industry
Australian Industry Group
Department of Resources, Energy and Tourism
Electricity Engineers Association, New Zealand
Energy Efficiency and Conservation Authority of New Zealand
Energy Networks Association
Engineers Association

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This Standard was issued in draft form for comment as DR AS/NZS 60076.2.

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-008, Power Transformers, to supersede AS 2374.2—1997, *Power transformers*, Part 2: *Temperature rise*.

The objective of this Standard is to provide designers, suppliers, purchasers and users of liquid-filled power transformers with a set of normal temperature service conditions and temperature rise limits with provision for special service conditions and methods of testing transformers to verify compliance.

This Standard is an adoption with national modifications and has been reproduced from IEC 60076-2, Ed. 3.0 (2011), *Power transformers,* Part 2: *Temperature rise for liquid-immersed transformers*, and has been varied as indicated to take account of Australian and New Zealand conditions. The variations are specified in Appendix ZZ. Appendix ZA provides additional informative details.

Appendix ZZ addresses the following issues:

(a) Clarification of Clause 6.2.

(b) Description of a typical ambient temperature measuring method commonly used in Australia.

(c) Additional information for Annexes 'D' and 'E' to assist in assessment of results.

(d) Technical correction in Annex 'E'.

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

(i) This Standard is applicable only to liquid-immersed transformers.

(ii) The winding hot-spot temperature rise limit is introduced among the prescriptions.

(iii) The modalities for the temperature rise test were improved in relation to the new thermal requirements.

(iv) Five informative annexes have been added in order to facilitate the standard application.

The variations described in Appendix ZZ form the Australian and New Zealand variations for the purposes of the CB Scheme for recognition of testing to standards for safety and electrical equipment.

As this Standard is reproduced from an International Standard, the following applies:

(A) In the source text 'this part of IEC 60076' should read 'this Australian/New Zealand Standard'.

(B) A full point should be substituted for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian Standards, as follows:

Reference to International Standard		*Australian Standard*	
IEC		AS	
60076	Power transformers	60076	Power transformers
60076-1	Part 1: General	60076.1	Part 1: General
		2374	Power transformers
60076-8	Part 8: Application guide	2374.8	Part 8: Application guide

Only international references that have been adopted as Australian or Australian/New Zealand Standards have been listed.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the annex or appendix to which they apply. A 'normative' annex or appendix is an integral part of a Standard, whereas an 'informative' annex or appendix is only for information and guidance.

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AUSTRALIAN/NEW ZEALAND STANDARD

Power transformers

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Temperature rise for liquid-immersed transformers
(IEC 60076-2, Ed. 3.0 (2011) MOD)

1 Scope

This part of IEC 60076 applies to liquid-immersed transformers, identifies power transformers according to their cooling methods, defines temperature rise limits and gives the methods for temperature rise tests.

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, *Power transformers – Part 1: General*

IEC 60076-8:1997, *Power transformers – Part 8: Application guide*

IEC 60085:2007, *Electrical insulation – Thermal evaluation and designation*

IEC 61181:2007, *Mineral oil-filled electrical equipment – Application of dissolved gas analysis (DGA) to factory tests on electrical equipment*

IEC Guide 115:2007, *Application of uncertainty of measurement to conformity assessment activities in the electrotechnical sector*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60076-1 and the following apply.

3.1
external cooling medium
the medium external to the transformer cooling system (air or water) into which the heat produced by the transformer losses is transferred

3.2
internal cooling medium
the liquid in contact with the windings and other transformer parts by means of which the heat produced by the losses is transferred to the external cooling medium

NOTE The liquid can be mineral oil or other natural and synthetic liquid.

3.3
temperature rise
the difference between the temperature of the part under consideration (for example, the average winding temperature) and the temperature of the external cooling medium