AS 2374.7—1997
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Australian Standard®

Power transformers

Part 7: Loading guide for oil-immersed power transformers

[IEC title: Loading guide for oil-immersed power transformers]

This Australian Standard was prepared by Committee EL/8, Power Transformers. It was approved on behalf of the Council of Standards Australia on 25 August 1997 and published on 5 December 1997.

The following interests are represented on Committee EL/8:

Australasian Railway Association

Australian Chamber of Commerce and Industry

Australian Electrical and Electronic Manufacturers Association

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PREFACE

This Standard was prepared by the Standards Australia Committee EL/8, Power Transformers to supersede AS 1078—1984, *Guide to loading of oil-immersed transformers*.

It is technically equivalent to, and has been reproduced from, IEC 354, *Loading guide for oil-immersed power transformers*, incorporating IEC Corrigendum issued in 1992. (Note that these corrections are not marked in the text).

Appendix ZZ lists variations between this Standard and IEC 354. For the purposes of this Standard, the IEC text is amended, supplemented or replaced as set out in Appendix ZZ. These changes are indicated by a rule in the margin against each clause or part thereof affected.

Appendices ZA and ZB provide information on the determination of the thermal time-constant and indirect measurement of winding hot-spot temperature respectively.

This Standard will apply directly to transformers manufactured to AS 2374, Parts 1 and 2 (1997) and may be used for transformers manufactured to AS 2374—1970. It differs in a number of respects from AS 1078—1984. The range of oil-immersed transformers covered has been extended and now goes beyond the 75 MVA, 132 kV size of the previous guides. Transformers are classified into three size categories—distribution, medium power and large power transformers with different thermal characteristics and limits applicable for each category.

There have been changes to the hot spot factor, oil exponent, temperature and current limits, but no change to the rate of thermal ageing of insulation with temperature. In some cases the changes will result in higher ratings and in other cases lower ratings but limits provided take into consideration the type of loading viz. normal cyclic, long time cyclic and emergency ratings. The weighted average ambient temperatures are now determined by considering a sinusoidal and double sinusoidal temperature variation.

In this Standard the user is required to determine the oil thermal time constant from the transformer temperature rise test, however, in cases when insufficient information is available to do this, an alternative method is given in Appendix ZA as provided in the previous edition. The change in oil time constant for different loads has been dropped in this edition (oil index is now 1.0). For OF and OD cooling, calculations are based on the bottom oil temperature rather than the top oil temperature and for OD cooling a correction factor is applied for variations in ohmic resistance with temperature. The mean oil temperature for these calculations is determined by the R´ method.

As in AS 1078—1984 the tables set out in Section 3 are based on a set of transformer characteristics for each category of transformer. No correction factors or similar are provided for variations to these characteristics and following common practice with the use of modern computers, users are encouraged to perform their own calculations based on the algorithms provided.

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

(a) Its number does not appear on each page of text and its identity is shown only on the cover and title pages.

(b) In the source text, ‘this International Standard’ should read ‘this Australian Standard’.

(c) A full point substitutes for a comma when referring to a decimal marker.

References to international Standards should be replaced by equivalent Australian Standards, as follows:

Reference to International Standard		*Australian Standard*	
IEC		AS	
76	Power transformers	2374	Power transformers
76-1	Part 1: General	2374.1	Part 1: General requirements
76-2	Part 2: Temperature rise	2374.2	Part 2: Temperature rise

76-4*	Part 4: Tappings and connections	2374.1	Part 1: General requirements
76-5	Part 5: Ability to withstand short-circuit	2374.5	Part 5: Ability to withstand short-circuit

* Superseded by IEC 76-1:1993.