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POWER TRANSFORMERS
Part 6—SOUND LEVELS

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STANDARDS ASSOCIATION OF AUSTRALIA
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The following interests were represented on the committee responsible for the preparation of this standard:

Australian-British Trade Association

Australian Electrical and Electronic Manufacturers Association

Confederation of Australian Industry

Defence Standardization Committee

Electrical testing laboratories

Electricity Supply Association of Australia

Electricity Supply Engineers Association of N.S.W.

Institution of Engineers, Australia

Railways of Australia Committee

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AUSTRALIAN STANDARD

POWER TRANSFORMERS
Part 6
SOUND LEVELS

AS 2374, Part 6—1982

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PREFACE

This standard was prepared by the Association's Committee on Power Transformers. It is based on AS C61, Power Transformers, for the setting of acceptable levels of sound, and on IEC 551, Measurement of Transformer and Reactor Sound Levels, for methods of measurement, and is Part 6 of a six-part standard to supersede AS C61.

The other Parts of the standard are—

Part 1—General Requirements
Part 2—Temperature Rise
Part 3—Insulation Levels and Dielectric Tests
Part 4—Tappings and Connections
Part 5—Ability to Withstand Short Circuit.

For this standard, it was decided to maintain the previous practice of specifying sound levels in terms of sound pressure. However, when sufficient comparative data have been gathered, the standard will be reviewed to provide for the conversion of the sound levels given in Appendix A to levels in terms of sound power.

This standard may require reference to the following standards:

AS 1259	Sound Level Meters Part 2—Type 2, Precision
SAA MP44	Guide for the Use of Sound Measuring Equipment Part 1—Portable Sound Level Meters.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard for POWER TRANSFORMERS

PART 6—SOUND LEVELS

1 SCOPE. This standard defines the permissible limits of sound level which may be generated by a transformer and sets out the methods of measuring that sound level.

2 APPLICATION. This standard is intended to apply to measurements made in the manufacturer's works as, when measurements are made on site, conditions may be very different owing to proximity of other objects, extraneous noises, etc. Nevertheless, the same general rules given herein may be followed when site measurements are made.

The methods described are applicable to transformers of all types covered by AS 2374, Part 1, without further limitation as regards size or voltage, and when fitted with their normal auxiliary equipment, that may influence the measurement result. There may however be special cases where configurations and electrical safety demands different test methods. These methods and the acceptable sound levels shall then be agreed between the purchaser and the manufacturer.

3 DEFINITIONS. For the purpose of this standard, the definitions in AS 2374, Part 1, and the following definitions apply:

3.1 Sound level—the reading given by a sound level meter complying with Clause 5 herein.

NOTE: This instrument responds to sound pressure.

3.2 Principal radiating surface—a hypothetical surface surrounding the transformer or cooling equipment which is assumed to be the surface from which sound is radiated.

NOTE: The method for determining the principal radiating surface for particular equipment is given in Clause 7.2.

3.3 Prescribed contour—a horizontal line, spaced at a definite distance from the principal radiating surface, along which the measurement points are located.

NOTE: The method for determining the prescribed contour for particular equipment is given in Clause 7.2.

3.4 Background noise—the noise present at the measuring position with the exclusion of that produced by the equipment the sound level of which is being measured. It includes the noise from all other apparatus necessary for the measurement process.

4 PERMISSIBLE SOUND LEVEL.

4.1 Standard Sound Levels. The mean sound level of a transformer shall not exceed the value given in Tables A1.1, A1.2 and A3 of Appendix A for the appropriate rating of oil-immersed and dry-type transformers respectively, when measured at the factory.

4.2 Special Reduced Sound Levels. Special reduced mean sound levels may be specified for some oil-immersed transformers. The sizes of transformers and the appropriate values of sound level are given in Table A2 of Appendix A.

4.3 Other Sound Levels. Where other mean sound levels are required, they are subject to agreement between the purchaser and the manufacturer.

4.4 Acceptance or Rejection of Sound Level Performance. The acceptance or rejection of any transformer, the mean sound level of which exceeds that specified by the purchaser is subject to negotiation between the purchaser and the manufacturer.

4.5 Choice of kV.A. Rating in Tables A1.1, A1.2, A2 and A3.

4.5.1 *General.* The tables in Appendix A show specific kilovolt ampere ratings (and not ranges). For a rating intermediate between those shown, the sound level for the next higher rating shall be used.

4.5.2 *Transformers with combined cooling (maximum sound level).* The maximum permissible sound level appropriate to the modes of cooling of a transformer having a combination of natural and forced cooling shall be that appropriate to the maximum rating with all cooling equipment operating.

4.5.3 *Transformers with combined cooling (sound level for reduced cooling).* Where a transformer is to be tested for sound level with reduced cooling and correspondingly reduced rating, the permissible sound level shall be that shown in the appropriate table for the correspondingly reduced rating.

4.5.4 *Multi-winding transformers.* For the purpose of determining permissible sound levels, the rating of a multi-winding transformer shall be taken as half the sum of the kilovolt ampere ratings of all windings. Where mixed cooling is also involved, see Clauses 4.6.2 and 4.6.3.

5 TEST INSTRUMENTS. Measurements shall be made using a sound level meter complying with AS 1259, Part 2, with the A-weighting network incorporated.

Sound level measurements should be carried out in accordance with the recommendations of SAA MP44.

6 CONDITIONS FOR MEASUREMENT.

6.1 Criteria for Adequacy of the Test Environment. The test environment should be free from reflecting objects other than a reflecting floor so that the equipment under test radiates into a free field over a reflecting plane.