AS 2586—1983

Australian Standard®

Audiometers

This Australian standard was prepared by Committee AK/2, Techniques for Measurement. It was approved on behalf of the Council of the Standards Association of Australia on 18 October 1982 and published on 7 February 1983.

The following interests were represented on the committee responsible for the preparation of this standard:

Audiological Acoustical Society
Australian Acoustical Society
CSIRO, Division of Building Research
CSIRO, National Measurement Laboratory
Department of Defence
Department of Health, N.S.W.
Department of Transport and Construction
Hearing Aid Council of Australia
Metal Trades Industry Association of Australia
National Acoustic Laboratories
Otological Society of Australia
Telecom
Universities

This Standard was issued in draft form for comment as DR 81035.

AS 2586—1983

Australian Standard®

Audiometers

First published 1983

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140

ISBN 0 7262 2809 5

PREFACE

This standard was prepared by a subcommittee of the Association's Committee on Techniques for Measurement. It is based on IEC 645—1979, Audiometers, to which it corresponds in all essential details, and supersedes AS Z43, Instrumentation for Audiometry, Part 1—1971, Pure Tone Audiometers, and AS 1591, Instrumentation for Audiometers, Part 6—1977, Speech Audiometers.

This standard provides for five types of audiometers, viz Types 1, 2, 3, 4 and 5. This classification is based on the type of test signal they generate, i.e. pure tone or speech or both, and according to the mode of operation or according to their complexity or range of functions they test, e.g. diagnostic, screening, free-field.

Provision is made for the testing of hearing by means of air-conduction earphones and bone-conduction vibrators using pure tones of specified frequencies and sound pressure level ranges, and also by means of speech signals. Specifications are given for the masking sounds required for standard tests of audiological function. Manual and automatic recording types of audiometer are included.

CONTENTS

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard for AUDIOMETERS

1 SCOPE. This standard specifies requirements for audiometers designed primarily for use in determining hearing threshold levels in comparison with a chosen standard reference threshold level.

NOTE: A recommended form of chart for the recording of audiometric measurements is given in Appendix C.

2 OBJECT. The object of this standard is to ensure—

(a) that tests of hearing, particularly threshold, on a given human ear performed with different audiometers which comply with this standard shall give substantially the same results under comparable conditions; and

(b) that the results obtained shall represent a good comparison between the hearing of the ear tested and the reference threshold of hearing.

3 REFERENCED DOCUMENTS. The following standards are referred to in this standard:

AS 1591 Instrumentation for Audiometry
- Part 4 — A Mechanical Coupler for Calibration of Bone Vibrators Used in Hearing Aids and Audiometers*
- Part 5 — Wide Band Artificial Ear

AS 1633 Glossary of Acoustic Terms

AS 3100 Approval and Test Specification for Definitions and General Requirements for Electrical Materials and Equipment

AS Z43 Instrumentation for Audiometry
- Part II — Reference Zero for the Calibration of Pure Tone Audiometers
- Part III — Reference Coupler for the Calibration of Earphones Used in Audiometry

IEC 268 Sound System Equipment
Z68-3 — Part 3: Sound System Amplifiers

4 CLASSIFICATION. Audiometers shall be classified into five types, viz Types 1, 2, 3, 4 and 5, according to the type of test signal they generate, i.e. pure tone or speech or both, and according to the mode of operation or according to their complexity or the range of auditory functions they test, e.g. diagnostic, screening, free-field.

Audiometers with which it is possible to make a diagnostic assessment (having as a minimum both air-conduction and bone-conduction facilities) are classified as Types 1, 2 and 3. Instruments with air-conduction facilities only are classified as Types 4 and 5.

NOTES:

1. All audiometers and other equipment for subjective audio-logical tests can be considered as a series of functional units. This standard covers the general requirements for audiometers as a whole as well as their functional units; signal sources, signal level controls and transducers.
2. In addition, as the units specified cover the majority of audiometric applications, instruments which may not necessarily be conventional pure tone audiometers (such as an acoustic impedance admittance system or a narrow-band noise generator), but which contain circuitry for measurement of auditory sensitivity or presentation of supraliminal signals should, where possible, comply with the appropriate Clauses of this standard. By using Table 1, the reader should be able to find the appropriate Clauses (6 to 9) of this standard which describe the performance requirements for a given instrument.
3. This standard is not intended to restrict or inhibit the development and incorporation of new features or other improvements likely to assist with audiological measurement, especially instruments designed to test hearing by objective methods.

5 DEFINITIONS. For the purpose of this standard, the following definitions apply:

NOTE: For other definitions of acoustic terms, see AS 1633.

5.1 Pure tone audiometer — an instrument for the measurement of hearing for pure tones and in particular the auditory threshold.

5.1.1 *Manual audiometer* — a pure tone audiometer in which the signal presentations, frequency and hearing level selection and recording of the results are performed manually.

5.1.2 *Automatic recording audiometer* — a pure tone audiometer in which signal presentations, hearing level variation, frequency selection or frequency variation, and recording of subject responses are implemented automatically.

5.2 Speech audiometer — an instrument for the measurement of hearing for speech test material.

5.3 Air conduction — the transmission of sound through the external and middle ear.

5.4 Bone conduction — the transmission of sound to the internal ear mediated by mechanical vibration of the cranial bones and soft tissues.

5.5 Equivalent threshold level (monaural listening) — the equivalent threshold level of an ear at a specified frequency, for a specified type of transducer to the human head is the vibration level or sound pressure level set up by the transducer at that frequency in a specified coupler or artificial ear when the transducer is actuated by that voltage, which with the transducer applied to the ear concerned, would correspond to the threshold of hearing.

5.6 Reference equivalent threshold level† — the reference equivalent level at a specified frequency, for a specified type of transducer, and for a specified pattern of coupler or artificial ear, is the modal value, at that frequency, of the equivalent threshold levels of an

* In course of revision.

† The values of reference equivalent threshold vibration levels for bone conduction are under consideration.