AS 4241—1994
IEC 1043:1993

Australian Standard®

Acoustics—Instruments for the measurement of sound intensity—Measurement with pairs of pressure sensing microphones

[IEC title: Electroacoustics—Instruments for the measurement of sound intensity—Measurement with pairs of pressure sensing microphones]

This Australian Standard was prepared by Committee AV/2, Acoustics Instrumentation and Measurement Techniques. It was approved on behalf of the Council of Standards Australia on 3 August 1994 and published on 17 October 1994.

The following interests are represented on Committee AV/2:

Association of Consulting Engineers, Australia

Australian Acoustical Society

Australian and New Zealand Environment and Conservation Council

Australian Hearing Services

Civil Aviation Authority

CSIRO—Division of Applied Physics

CSIRO—Division of Building, Construction and Engineering

Department of Occupational Health Safety and Welfare, Western Australia

National Association of Testing Authorities, Australia

University of Queensland

WorkCover Authority of N.S.W.

Australian Standard®

Acoustics—Instruments for the measurement of sound intensity—Measurement with pairs of pressure sensing microphones

First published as AS 4241—1994.

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140
ISBN 0 7262 9210 9

PREFACE

This Standard was prepared by the Standards Australia Committee on Acoustics Instrumentation and Measurement Techniques. It is identical with and reproduced from IEC 1043:1993, *Electroacoustics—Instruments for the measurement of sound intensity—Measurement with pairs of pressure sensing microphones*.

The objective of this Standard is to specify the performance requirements for sound intensity instruments, comprising sound intensity probes and processors, which detect sound intensity by pairs of spatially separated pressure sensing microphones.

Under arrangements made between Standards Australia and the International Standards Bodies, ISO and IEC, as well as certain other Standards organizations, users of this Australian Standard are advised that the number of this Standard is not reproduced on each page; its identity is shown only on the cover and title pages.

For the purpose of this Australian Standard, the source text should be modified as follows:

(i) *Terminology* The words 'Australian Standard', should replace the words 'International Standard' wherever they appear.

(ii) *Decimal marker* Substitute a full point for a comma as a decimal marker.

(iii) *References* The references to International Standards should be replaced by references to the following Australian Standards:

Reference to International Standard or other publication		*Australian Standard*	
IEC		AS	
651	Sound level meters	1259	Sound level meters
		1259.1	Part 1: Non-integrating
942	Sound calibrators	—	
1260	Specification for octave-band and fractional octave-band filters (under consideration). (Revision of IEC 225:1966)	—	
ISO			
9614	Acoustics—Determination of sound power levels of noise sources using sound intensity	—	
9614-1	Part 1: Measurement at discrete points	—	

CONTENTS

INTRODUCTION

This International Standard specifies the requirements for sound intensity instruments, comprising sound intensity probes and processors, which detect sound intensity by pairs of spatially separated pressure sensing microphones. These instruments, and others employing different detection methods, are still the subject of development.

Sound intensity instruments have two main applications. The first is the investigation of the radiation characteristics of sound sources. The second is the determination of the sound power of sources, especially *in situ*, where sound intensity measurement enables sound power determination to be made under acoustical conditions which render determination by sound pressure measurement impossible.

This International Standard applies to instruments to be used for the determination of sound power in accordance with the requirements of ISO 9614-1 and ensures well-defined performance for instruments used in other applications.

Specifications and tolerances are based on current instrument technology and on typical industrial requirements for dynamic capability index.

Requirements for the verification of performance of probes and processors are written in terms of type tests. A scheme for periodic verification, serving as the basis of the periodic recalibrations required in many countries, is given in annex A.

Probes and processors are treated separately and together; in the latter case they are called “instruments”.

NOTES

AUSTRALIAN STANDARD

Acoustics—Instruments for the measurement of sound intensity—Measurement with pairs of pressure sensing microphones

1 Scope

The primary purpose of this Standard is to ensure the accuracy of measurements of sound intensity applied to the determination of sound power in accordance with ISO 9614-1. To meet the requirements of that standard, instruments are required to analyse the sound intensity in one-third octave or octave bands, and optionally to provide A-weighted band levels. They are also required to measure sound pressure level in addition to sound intensity level to facilitate the use of the field indicators described in ISO 9614-1.

This International Standard only applies to instruments which detect sound intensity by pairs of spatially separated pressure sensing microphones.

This International Standard specifies performance requirements for instruments used for the measurement of sound intensity, and their associated calibrators.

The requirements are intended to reduce to a practical minimum any differences in equivalent measurements made using different instruments, including instruments comprising probes and processors from different manufacturers.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 9614-1: 1993, *Acoustics — Determination of sound power levels of noise sources using sound intensity — Part 1: Measurement at discrete points*

IEC 651: 1979, *Sound level meters*

IEC 942: 1988, *Sound calibrators*

IEC 1260: 19XX, *Specification for octave-band and fractional octave-band filters* (under consideration). (Revision of IEC 225: 1966)