

ORGANISATION INTERNATIONALE
DE MÉTROLOGIE LÉGALE



INTERNATIONAL RECOMMENDATION

Sound calibrators

(with reference to International Standard 942-1988 of the International Electrotechnical Commission)

Calibreurs acoustiques

(en référence à la Norme Internationale 942-1988 de la Commission Électrotechnique Internationale)

OIML R 102

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CONTENTS

Foreword	3
1 Scope	4
2 Construction and maximum permissible errors	4
3 Stability	4
4 Inscription, marking and instruction manual	5
5 Marks	5
Annex A Extent of the procedures for pattern evaluation and verification of sound calibrators	6

FOREWORD

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SOUND CALIBRATORS

1 Scope

This Recommendation deals with sound calibrators, i.e. devices designed to produce a known effective sound pressure level or levels at a specified frequency or frequencies when coupled to specified types of microphone in specified configurations (e.g. with or without protective grid). Such devices are used for the acoustical calibration of microphones and sound measuring instruments. The Recommendation contains an appropriate test scheme for pattern evaluation and verification.

2 Construction and maximum permissible errors

2.1 Sound calibrators of classes 0, 1 and 2 that are submitted to the control of Legal Metrology Services shall comply with the requirements formulated in the International Standard IEC 942, first edition 1988.

The sound calibrators shall meet the tolerances stated in IEC 942, which are considered as the maximum permissible errors on pattern evaluation, initial verification and subsequent verification.

2.2 When different values for maximum permissible errors in service and at verification are prescribed by national regulation, the values of the maximum permissible errors in service shall be 1.25 times those specified for verification. The stated maximum permissible errors apply to sound pressure and frequency, corrected if necessary in accordance with IEC 942, subclause 3.3. The maximum permissible harmonic distortion for all classes is 3 % for pattern evaluation and verification, and 4 % in service.

When a barometer or a thermometer or both are specified by the manufacturer as necessary for the correct use of the sound calibrator and are supplied, they shall also be subject to pattern evaluation and verification.

2.3 The characteristics to be examined for pattern evaluation and verification are listed in Annex A.

3 Stability

The materials used and the construction of sound calibrators shall ensure sufficient stability to enable the instrument to comply with the tolerances and stability limits stated in Tables I and II and subclause 3.4 of IEC 942 when the device is set up in accordance with manufacturer's instructions for normal use.

4 Inscription, marking and instruction manual

4.1 Sound calibrators shall bear, clearly and indelibly, the following markings :

- a) manufacturer's name or trade mark,
- b) manufacturer's model designation and serial number,
- c) reference to IEC 942, by marking "IEC 942-1988",
- d) the class of instrument, and the letter "L" if applicable,
- e) pattern approval sign in conformity with national regulations.

4.2 Each sound calibrator shall be accompanied by an instruction manual which shall include all information listed in subclauses 4.1 and 4.2 of IEC 942.

4.3 Adaptors and other accessories that are parts of the main device shall be unambiguously identifiable by a list affixed to the device, or in an attached document or in any other appropriate manner.

5 Marks

It shall be possible to protect, by means of seals or marks, those parts and components of sound calibrators, accessible to the user, which may influence their accuracy.

A suitable place for the application of verification marks shall be provided.

ANNEX A
(mandatory)

EXTENT OF THE PROCEDURES FOR PATTERN EVALUATION AND VERIFICATION
OF SOUND CALIBRATORS

Preferably five specimens of the same pattern should be submitted for pattern evaluation. If only three specimens or fewer are tested, the acceptance for verification may be limited to two years so that further experience with the pattern may be gained.

Characteristics of sound calibrator (corresponding clauses of IEC 942-1988 in brackets)	Pattern evaluation	Verification
a) Acoustical and electrical properties		
A.1 Sound pressure level(s) when coupled to specified microphone(s) in specified configurations or to a given model of sound level meter (under reference ambient conditions) (2.2, 2.3, 2.4, 3.1 and 3.7)	x	x
A.2 Harmonic distortion (3.4)	x	x
A.3 Frequency (3.2)	x	x
A.4 Tone-burst capability (if applicable) (3.5)	x	x (3.5.1 only)
A.5 Battery voltage (3.6)	x	
b) Sensitivity to various environments		
A.6 Ambient pressure (3.3.1)	x	
A.7 Ambient temperature (3.3.2)	x	
A.8 Ambient humidity (3.3.3)	x	
A.9 Mechanical vibration (3.8)	x	

Characteristics of sound calibrator (corresponding clauses of IEC 942-1988 in brackets)	Pattern evaluation	Verification
A.10 Magnetic field (3.8)	x	
A.11 Electromagnetic susceptibility (*)	x	
c) Additional equipment		
A.12 Barometer (if applicable) (3.3.1)	x	x (at selected pressure)
A.13 Thermometer (if applicable) (3.3.2)	x	x (at selected temperature)

(*) See International Document OIML D 11 "General requirements for electronic measuring instruments".

