



SLOVENSKI STANDARD
SIST HD 590 S1:2004

01-julij-2004

Mechanical coupler for measurements on bone vibrators (IEC 60373:1990)

Mechanical coupler for measurements on bone vibrators

Mechanischer Kuppler für Messungen an Knochenleitungshörern

Coupleur mécanique destiné aux mesures des ossivibrateurs

Ta slovenski standard je istoveten z: HD 590 S1:1991

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ICS:

17.140.50 Elektroakustika Electroacoustics

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HARMONIZATION DOCUMENT

HD 590 S1

DOCUMENT D'HARMONISATION

HARMONISIERUNGSDOKUMENT

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Descriptors: Audiometry, electroacoustics, hearing aids, bone vibrator, calibration, coupler, specification, measurement, characteristic

ENGLISH VERSION

MECHANICAL COUPLER FOR MEASUREMENTS ON BONE
VIBRATORS
(IEC 373:1990)

Coupleur mécanique destiné aux
mesures des ossivibrateurs
(CEI 373:1990)

Mechanische Kuppler für
Messungen an Knochenleitungshörern
(IEC 373:1990)

This Harmonization Document was approved by CENELEC on 1991-03-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for implementation of this Harmonization Document on a national level.

Up-to-date lists and bibliographical references concerning national implementation may be obtained on application to the Central Secretariat or to any CENELEC member.

This Harmonization Document exists in three official versions (English, French, German).

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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CENELEC
European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B-1050 Brussels

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FOREWORD

The CENELEC questionnaire procedure, performed for finding out whether or not the International Standard IEC 373:1990 could be accepted without textual changes, has shown that no CENELEC common modifications were necessary for the acceptance as Harmonization Document.

The reference document was submitted to the CENELEC members for formal vote and was approved by CENELEC as HD 590 S1 on 1 March 1991.

The following dates were fixed:

- latest date of announcement
of the HD at national level (doa) 1991-09-01
- latest date of publication of
a harmonized national standard (dop) 1992-03-01
- latest date of withdrawal of
conflicting national standards (dow) 1992-03-01

For products which have complied with the relevant national standard before 1992-03-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1997-03-01.

Annexes designated "normative" are part of the body of the standard. In this standard, annex ZA is normative.

ENDORSEMENT NOTICE

The text of the International Standard IEC 373:1990 was approved by CENELEC as a Harmonization Document without any modification.

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ANNEX ZA (normative)

OTHER INTERNATIONAL PUBLICATIONS QUOTED IN THIS STANDARD
WITH THE REFERENCES OF THE RELEVANT EUROPEAN PUBLICATIONS

IEC				
<u>Publication</u>	<u>Date</u>	<u>Title</u>	<u>EN/HD</u>	<u>Date</u>
118-9	1985	Hearing aids - Part 9: Methods of measurement of characteristics of hearing aids with bone vibrator output	HD 450.9 S1	1987
645	1979	Audiometers	-	-
ISO				
<u>Publication</u>	<u>Date</u>	<u>Title</u>		
266	1975	Acoustics - Preferred frequencies for measurements		
7566	1987	Acoustics - Standard reference zero for the calibration of pure-tone bone conduction audiometers		

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**NORME
INTERNATIONALE
INTERNATIONAL
STANDARD**

**CEI
IEC
60373**

Deuxième édition
Second edition
1990-01

**Coupleur mécanique destiné aux mesures
des ossivibrateurs**

**Mechanical coupler for measurements
on bone vibrators**

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Numéro de référence
Reference number
CEI/IEC 60373: 1990

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MECHANICAL COUPLER FOR MEASUREMENTS
ON BONE VIBRATORS**

FOREWORD

- 1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.
- 3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.
- 4) The IEC has not laid down any procedure concerning marking as an indication of approval and has no responsibility when an item of equipment is declared to comply with one of its recommendations.

PREFACE

This standard has been prepared by IEC Technical Committee No. 29: Electroacoustics.

It replaces the first edition issued in 1971.

The text of this standard is based on the following documents:

Six Months' Rule	Report on Voting	Two Months' Procedure	Report on Voting
29C(C0)50	29C(C0)54	29C(C0)58	29C(C0)61

Full information on the voting for the approval of this standard can be found in the Voting Reports indicated in the above table.

The following publications are quoted in this standard:

- <https://standards.iteh.ai/catalog/standards/sist/f095277a-053e-4bd2-90e5-501414141414/sist-590-s1-2004>
- IEC 118-9 (1985): Hearing aids, Part 9: Methods of measurement of characteristics of hearing aids with bone vibrator output.
- IEC 645 (1979): Audiometers.
- ISO 266 (1975): Acoustics - Preferred frequencies for measurements.
- ISO 7566 (1987): Acoustics - Standard reference zero for the calibration of pure-tone bone conduction audiometers.
-

MECHANICAL COUPLER FOR MEASUREMENTS ON BONE VIBRATORS

1. Scope

This standard specifies requirements for mechanical couplers used for calibrating bone-conduction audiometers and for making measurements on bone vibrators and bone-conduction hearing aids in the frequency range from 125 Hz to 8 000 Hz inclusive.

2. Objects

2.1 *Audiometry*

The purpose of this standard, as applied to audiometry, is to provide a means of calibrating bone vibrators of the types used in bone-conduction audiometry by specifying a standardized mechanical impedance with which to load the vibrator and a device for measuring the alternating force produced. Reference equivalent threshold force levels corresponding to the normal threshold of hearing are specified by ISO 7566. For this application the bone vibrator is required to have a plane circular tip area of $175 \pm 25 \text{ mm}^2$ and to be applied to the mechanical coupler with a static force of $5,4 \pm 0,5 \text{ N}$, as specified in IEC 645. The mechanical coupler is also intended for other measurements on bone vibrators for audiometers viz. frequency response, unwanted sound radiation, harmonic distortion, etc.

2.2 *Hearing aids*

The purpose of this standard, as applied to hearing aids, is to provide a means of measuring the electro-mechanical characteristics (sensitivity, frequency response, harmonic distortion, etc.) of bone vibrators used in hearing aids, or the acousto-mechanical characteristics of complete hearing aids of the bone conduction type, when dynamically loaded by a specified mechanical impedance and applied with a static force in the range 1,7 N to 4 N.

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3. Definitions

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For the purpose of this standard the following terms apply:

3.1 *Bone vibrator*

An electro-mechanical transducer intended to produce the sensation of hearing by vibrating the cranial bones.

3.2 *Mechanical coupler*

A device designed to present a specified mechanical impedance to a bone vibrator applied with a specified static force, and equipped with a mechano-electric transducer to determine the alternating force level at the surface of contact between vibrator and mechanical coupler.

3.3 *Alternating force level (force level)*

Twenty times the logarithm to the base 10 of the ratio of the r.m.s. value of the force transmitting the vibration to the reference value of one micronewton (1 μN). Unit: dB.

3.4 *Mechanical Impedance* of a sinusoidally vibrating object at a specified frequency. The complex quotient of the alternating force transmitting the vibration to the component of velocity of the object in the direction of the force. Unit: Nsm^{-1} .

3.5 *Mechanical impedance level*

Twenty times the logarithm to the base 10 of the ratio of the absolute value (modulus) of the mechanical impedance to the reference value of 1 Nsm^{-1} . Unit: dB.

3.6 *Mechanical resistance*

The real part of the (complex) mechanical impedance.

3.7 *Mechanical reactance*

The imaginary part of the (complex) mechanical impedance.

Note.- By convention, mechanical reactance due to inertia is assigned a positive sign.

3.8 *Sensitivity level*

Twenty times the logarithm to the base 10 of the ratio of the sensitivity of a mechanical coupler, defined as electrical output in volts for an applied alternating force in newtons, to the reference sensitivity of 1 V/N. Unit: dB.

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4. Design features and specification

4.1 *General*

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The mechanical coupler shall consist, in essence, of a rigid mass of approximately 3,5 kg containing a force-sensing element and surmounted by visco-elastic material having an external profile as specified in 4.4. The mechanical impedance of the assembly for uniaxial vibration which is coincident with its major axis of symmetry shall comply with the specifications in 4.2 and 4.3. The whole assembly shall