SLOVENSKI STANDARD
SIST EN 1793-2:2013

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Nadomešča:
SIST EN 1793-2:1999

Protihrupne ovire za cestni promet - Preskusna metoda za ugotavljanje akustičnih lastnosti - 2. del: Karakteristike, značilne za izolacijo pred zvokom v zraku

RRoad traffic noise reducing devices - Test method for determining the acoustic performance - Part 2: Intrinsic characteristics of airborne sound insulation under diffuse sound field conditions

Lärmschutzeinrichtungen an Straßen - Prüfverfahren zur Bestimmung der akustischen Eigenschaften - Teil 2: Produktspezifische Merkmale der Luftschalldämmung unter den Bedingungen eines diffusen Schallfeldes

Dispositifs de réduction du bruit du trafic routier - Méthode d'essai pour la détermination de la performance acoustique - Partie 2: Caractéristiques intrinsèques de l'isolation aux bruits aériens dans des conditions de champ acoustique diffus

Ta slovenski standard je istoveten z: **EN 1793-2:2012**

ICS:

17.140.30	Emisija hrupa transportnih sredstev	Noise emitted by means of transport
93.080.30	Cestna oprema in pomožne naprave	Road equipment and installations

SIST EN 1793-2:2013 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1793-2

November 2012

ICS 17.140.30; 93.080.30

Supersedes EN 1793-2:1997

English Version

Road traffic noise reducing devices - Test method for determining the acoustic performance - Part 2: Intrinsic characteristics of airborne sound insulation under diffuse sound field conditions

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This European Standard was approved by CEN on 29 September 2012.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 1793-2:2012) has been prepared by Technical Committee CEN/TC 226 “Road equipment”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2013, and conflicting national standards shall be withdrawn at the latest by March 2014.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1793-2:1997.

In the previous version of this European Standard, the scope covered the noise reducing devices wherever they can be used alongside roads. In the current version of this European Standard, as its adapted title states explicitly, the scope is restricted to noise reducing devices designed for use under diffuse field conditions, e.g. inside tunnels or deep trenches or under covers (an explanation is presented in the introduction).

EN 1793-2 is part of a series and should be read in conjunction with the following:

— EN 1793-1, *Road traffic noise reducing devices — Test method for determining the acoustic performance — Part 1: Intrinsic characteristics of sound absorption*;

— EN 1793-3, *Road traffic noise reducing devices — Test method for determining the acoustic performance — Part 3: Normalized traffic noise spectrum*;

— CEN/TS 1793-4, *Road traffic noise reducing devices — Test method for determining the acoustic performance — Part 4: Intrinsic characteristics — In situ values of sound diffraction*;

— CEN/TS 1793-5, *Road traffic noise reducing devices — Test method for determining the acoustic performance — Part 5: Intrinsic characteristics — In situ values of sound reflection and airborne sound insulation*;

— EN 1793-6, *Road traffic noise reducing devices — Test method for determining the acoustic performance — Part 6: Intrinsic characteristics — In situ values of airborne sound insulation under direct sound field conditions*.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

Noise reducing devices alongside roads have to provide adequate sound insulation so that sound transmitted through the device is not significant compared with the sound diffracted over the top. This European Standard specifies a test method for qualifying the intrinsic airborne sound insulation performance for noise reducing devices designed for roads in reverberant conditions, e.g. inside tunnels or deep trenches or under covers.

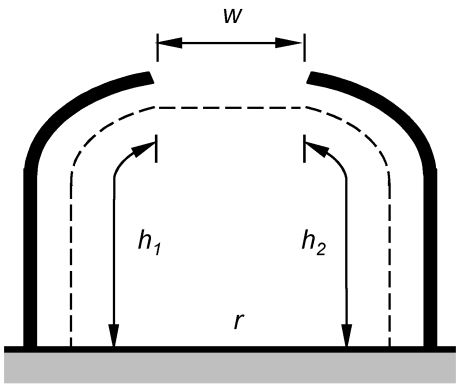
The measurement results of this method for airborne sound insulation are comparable but not identical with the results of the test method EN 1793-6, mainly because the present method uses a diffuse sound field, while the other method assumes a directional sound field. However, research studies suggest that a quite good correlation exists between the two methods.

The test method described in this European Standard should not be used to determine the intrinsic characteristics of airborne sound insulation for noise reducing devices to be installed on roads in non-reverberant conditions.

This European Standard is not concerned with determining insertion loss (extrinsic performance) which additionally depends on factors which are not related to the product itself; e.g. the dimensions of the barrier and quality of installation work and site factors such as ground impedance, site geometry etc. The test is designed to allow the intrinsic airborne sound insulation performance of the device to be measured; the resulting rating should aid the selection of devices for reverberant roadside applications.

This method may be used to qualify noise reducing devices for applications in other reverberant conditions, e.g. found along railways or near industrial sites. In these cases the single-number ratings should be calculated using an appropriate spectrum.

For the purpose of this European standard reverberant conditions are defined based on the geometric envelope, *e*, across the road formed by the barriers, trench sides or buildings (the envelope does not include the road surface) as shown by the dashed lines in Figure 1. Conditions are defined as being reverberant when the percentage of open space in the envelope is less than or equal to 25 %, i.e. reverberant conditions occur when $w/e \leq 0,25$, where $e = (w+h_1+h_2)$.



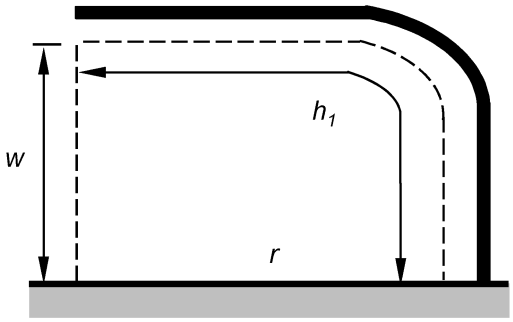
Key

h_1: length of left barrier surface

h_2: length of right barrier surface

envelope, $e = w+h_1+h_2$

(a) Partial cover on both sides of the road

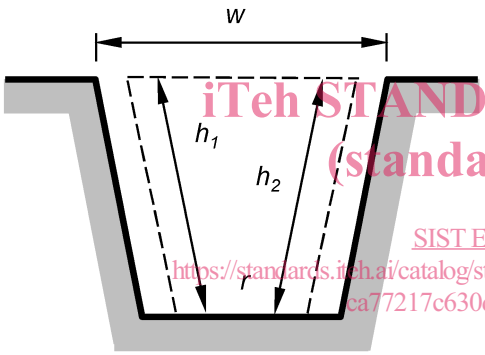


Key

h_1: length of partial cover surface envelope

$e = w+h_1$

(b) Partial cover on one side of the road



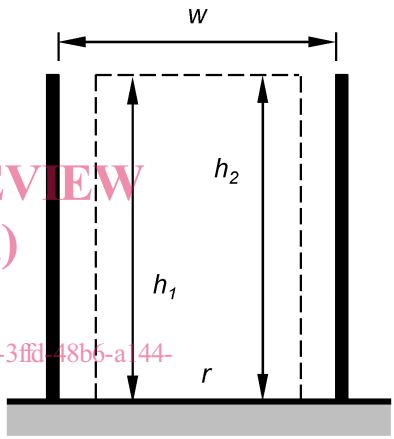
Key

h_1: length of left trench side

h_2: length of right trench side; envelope

envelope, $e = w+h_1+h_2$

(c) Deep trench



Key

h_1: length of left barrier/building

h_2: length of right barrier/building

envelope, $e = w+h_1+h_2$

(d) Tall barriers or buildings

In all cases r: road surface; w: width of open space.

Figure 1 —Sketch of the reverberant condition check in four cases (not to scale)

1 Scope

This European Standard specifies the laboratory method for measuring the airborne sound insulation performance of road traffic noise reducing devices in reverberant conditions. It covers the assessment of the intrinsic performance of barriers that can reasonably be assembled inside the testing facility described in EN ISO 10140-2 and EN ISO 10140-4.

This method is not intended for the determination of the intrinsic characteristics of airborne sound insulation of noise reducing devices to be installed on roads in non-reverberant conditions.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1793-3, *Road traffic noise reducing devices — Test method for determining the acoustic performance — Part 3: Normalized traffic noise spectrum*

EN ISO 10140-1, *Acoustics — Laboratory measurement of sound insulation of building elements — Part 1: Application rules for specific products (ISO 10140-1)*

EN ISO 10140-2, *Acoustics — Laboratory measurement of sound insulation of building elements — Part 2: Measurement of airborne sound insulation (ISO 10140-2)*

EN ISO 10140-4, *Acoustics — Laboratory measurement of sound insulation of building elements — Part 4: Measurement procedures and requirements (ISO 10140-4)*

3 Symbols

For the purposes of this document, the following symbols apply.

R_i	Sound reduction index in the i^{th} one-third octave band
L_i	Normalised A-weighted sound pressure level, in decibels, of traffic noise in the i^{th} one-third octave band defined in EN 1793-3
DL_R	Single-number rating of airborne sound insulation performance expressed as a difference of A-weighted sound pressure levels, in decibels

4 Test arrangement

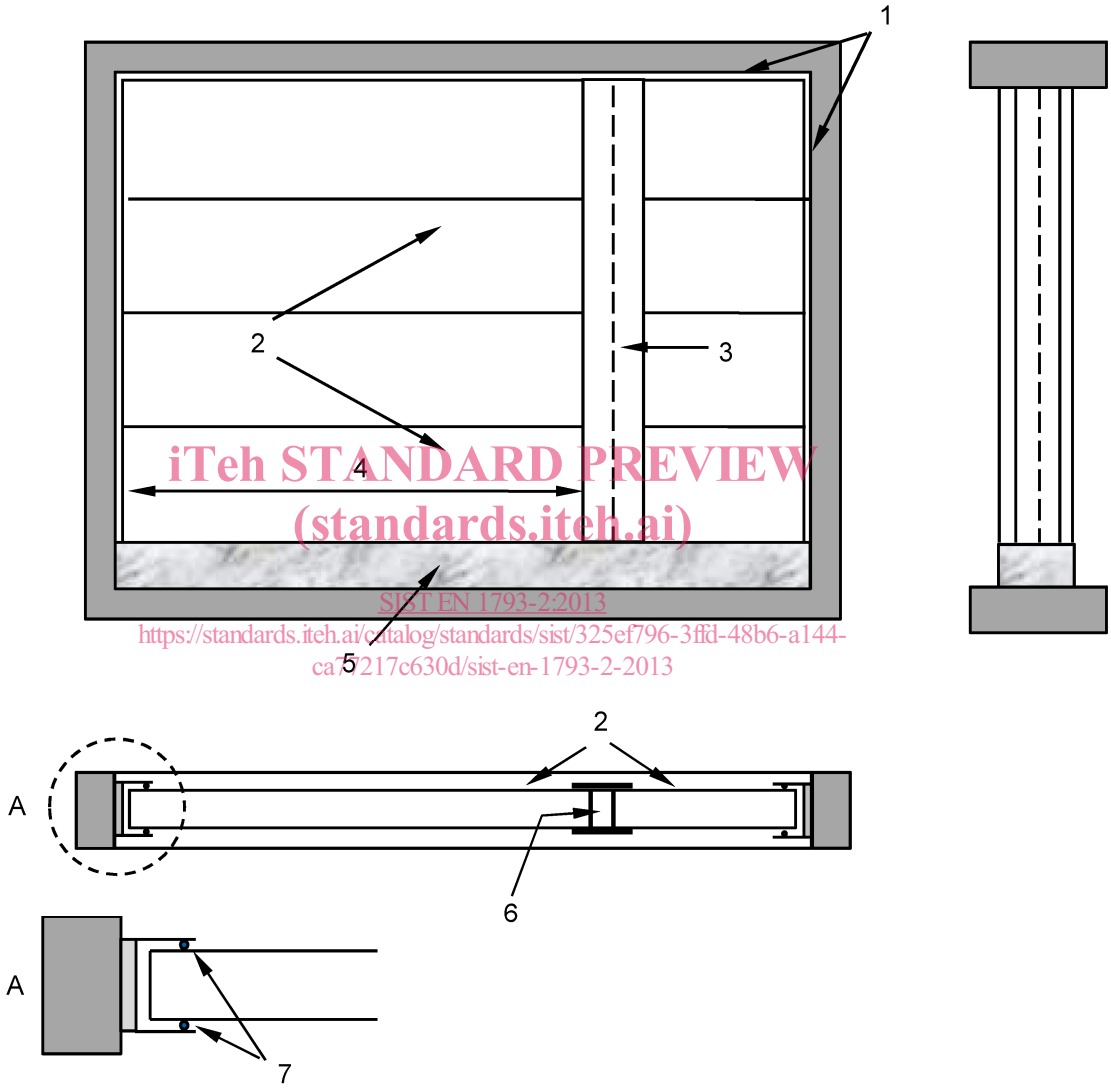
The test arrangement shall be as described in EN ISO 10140-1, EN ISO 10140-2 and EN ISO 10140-4 for partitions with the following modifications:

— The test specimen shall be mounted in the test opening and assembled in the same manner as the manufactured device is used in practice with the same connections and seals between component parts. The edge supports shall not overlap the sample by more than 70 mm and shall be sealed to prevent the leakage of sound.

— Where posts are employed in construction, at least one post shall be included in the specimen with panels attached on both sides. The length of the panels on one side of the post shall be ≥ 2 m (see Figure 1). The side that would face the traffic shall face the source room.

— The sample under test, excluding the plinth for levelling, shall have a windowed area not less than 9,5 m^2.

— The sample surface area to be used in calculations shall be the total surface area of the sample excluding the plinth for levelling and the overlap surface of the edge supports.



Key

1	sealing materials	5	bricked up plinth for levelling (if necessary)
2	panels (sealed as in practice)	6	post (sealed as in practice)
3	post	7	sealing materials to prevent edge leakage
4	L ≥ 2 m		

Figure 2 — Mounting conditions for test specimen