ICS 17.140.30, 93.080.30 SLOVENSKÁ TECHNICKÁ NORMA Apríl 2026

STN	**Zariadenia na zníženie hluku z cestnej dopravy Skúšobná metóda na určovanie akustických vlastností Časť 5: Vlastné charakteristiky Zvuková pohltivosť v podmienkach priameho zvukového poľa**	**STN EN 1793-5** 73 6041

Road traffic noise reducing devices - Test method for determining the acoustic performance - Part 5: Intrinsic characteristics - Sound absorption under direct sound field conditions

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 03/26

Obsahuje: EN 1793-5:2025

Oznámením tejto normy sa ruší
STN EN 1793-5 (73 6041) zo septembra 2016

obsahuje farebné strany

142266

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 1793-5

December 2025

ICS 17.140.30; 93.080.30

Supersedes EN 1793-5:2016, EN 1793-5:2016/AC:2018

English Version

Road traffic noise reducing devices - Test method for determining the acoustic performance - Part 5: Intrinsic characteristics - Sound absorption under direct sound field conditions

Dispositifs de réduction du bruit du trafic routier - Méthode d'essai pour la détermination de la performance acoustique - Partie 5: Caractéristiques intrinsèques - Absorption acoustique dans des conditions de champ acoustique direct

Lärmschutzvorrichtungen an Straßen - Prüfverfahren zur Bestimmung der akustischen Eigenschaften - Teil 5: Produktspezifische Merkmale - Schallabsorption in gerichteten Schallfeldern

This European Standard was approved by CEN on 17 November 2025.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN 1793-5:2025 E

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European foreword

This document (EN 1793-5:2025) 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of an identical text or by endorsement, at the latest by June 2026, and conflicting national standards shall be withdrawn at the latest by June 2026.

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

This document supersedes EN 1793-5:2016.

EN 1793-5:2025 includes the following significant technical changes with respect to EN 1793-5:2016:

— the definitions from 3.1 to 3.8 have been updated to be in accordance with all other parts of the series of standards;

— the single number rating DL_{RI} is now reported with one decimal digit;

— Annex A on the low-frequency limit and the window width has been added;

— one value for the standard deviation of reproducibility and repeatability in each one-third octave frequency band has been retained, in place of three values (min, max and median) as before (see Table B.1);

— Annex C (template of the test report) is now normative;

— the example in C.5 on the declaration of the measurement uncertainty has been updated accordingly.

The EN 1793 series, under the general title *Road traffic noise reducing devices — Test method for determining the acoustic performance*, consists of the following parts:

— *Part 1: Intrinsic characteristics — Sound absorption under diffuse sound field conditions;*

— *Part 2: Intrinsic characteristics — Airborne sound insulation under diffuse sound field conditions;*

— *Part 3: Normalized traffic noise spectrum;*

— *Part 4: Intrinsic characteristics — Intrinsic sound diffraction;*

— *Part 5: Intrinsic characteristics — Sound absorption under direct sound field conditions;*

— *Part 6: Intrinsic characteristics — Airborne sound insulation under direct sound field conditions.*

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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, France, Germany, Greece, Hungary, Iceland,

Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Introduction

This document describes a test method for determining the intrinsic characteristics of sound absorption of road traffic noise reducing devices designed for roads in non-reverberant conditions (a measure of intrinsic performance). The methodology assesses indirectly sound absorption by measuring sound reflection (the complementary characteristics). It can be applied indoors or outdoors. Indoors, it can be applied in a purposely built test facility (under direct sound field conditions). Outdoors, it can be applied in a purposely built test facilities, e.g. near a laboratory or a factory, as well as *in situ*, i.e. where the road traffic noise reducing devices are installed. The method can be applied without damaging the surface.

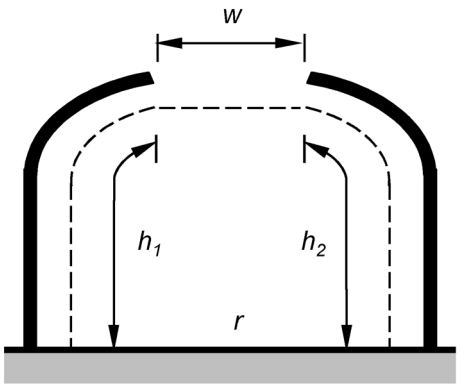
The method can be used to qualify products to be installed along roads as well as to verify the compliance of installed noise reducing devices to design specifications. Regular application of the method can be used to verify the long-term performance of noise reducing devices. The method requires the average of results of measurements taken in different points in front of the device under test and/or for specific angles of incidences. The method is able to investigate flat and non-flat products.

The measurement results of this method for sound absorption are not comparable with the results obtained under diffuse sound field conditions (EN 1793-1:2025), mainly because the present method uses a directional sound field, not a diffuse sound field. The test method described in the present document should not be used to determine the intrinsic characteristics of sound absorption of road traffic noise reducing devices to be installed in reverberant conditions, e.g. claddings inside tunnels or deep trenches.

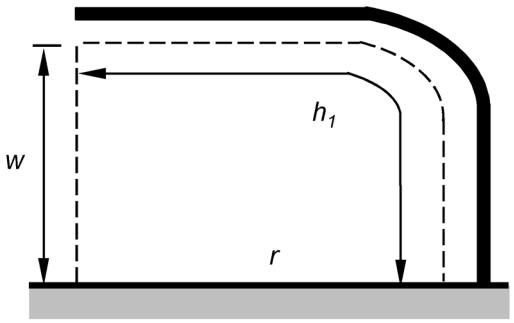
For the purpose of this document, reverberant conditions are defined based on the geometric envelope, *e*, across the road formed by the barriers, trench sides or buildings (the envelope does not include the road surface) as shown by the dashed lines in Figure 1. Conditions are defined as being reverberant 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 $e = (w+h_1+h_2)$.

This method introduces a specific quantity as a function of frequency, called sound reflection index, to define the sound reflection in front of a road traffic noise reducing device and then calculate a single-number rating for sound absorption from it, while the measurements under diffuse sound field conditions (according to EN 1793-1:2025) gives a sound absorption coefficient as a function of frequency and then calculate a single-number rating for sound absorption from it. Values of the sound absorption coefficient measured under diffuse sound field conditions can be converted to conventional values of a reflection coefficient, taking the complement to one. In this case, research studies suggest that some correlation exists between diffuse sound field data, measured according to EN 1793-1:2025 and direct sound field data, measured according to the method described in this document [6], [9], [17], [18], [19], [23].

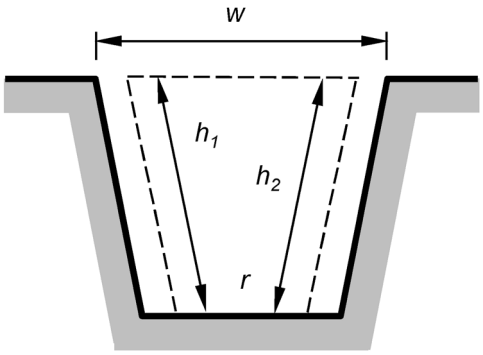
This method can be used to qualify noise reducing devices for other applications, e.g. to be installed nearby industrial sites. In this case, the single-number ratings can preferably be calculated using an appropriate spectrum.



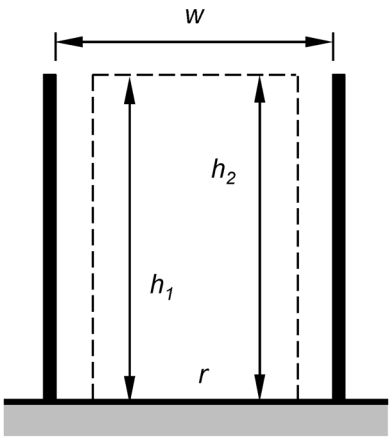
(a) Partial cover on both sides of the road; envelope, $e = w+h_1+h_2$



(b) Partial cover on one side of the road; $e = w+h_1$; $h_2 = 0$



(c) Deep trench envelope, $e = w+h_1+h_2$



(d) Tall barriers or buildings; envelope, $e = w+h_1+h_2$

Key

r	road surface
w	width of open space
h_1	developed length of the construction, e.g. cover, trench side, barrier or building
h_2	developed length of the construction, e.g. cover, trench side, barrier or building

NOTE Figure 1 is not to scale.

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

1 Scope

This document specifies a test method for measuring a quantity representative of the intrinsic characteristics of sound reflection from road noise reducing devices, the sound reflection index, and then calculate a single-number rating for sound absorption from it.

This document is applicable to:

— the determination of the intrinsic characteristics of sound absorption of noise reducing devices to be installed along roads, to be measured either on typical installations alongside roads or on a relevant test specimen section;

— the determination of the intrinsic characteristics of sound absorption of road traffic noise reducing devices in actual use under direct sound field conditions;

— the comparison of design specifications with actual performance data after the completion of the construction work;

— the verification of the long-term performance of road traffic noise reducing devices (with a repeated application of the method).

This document does not apply to:

— the determination of the intrinsic characteristics of sound absorption of road traffic noise reducing devices to be installed in reverberant conditions, e.g. inside tunnels or deep trenches.

Results for the sound reflection index are expressed as a function of frequency, in one-third octave bands between 200 Hz and 5 kHz, for qualification purposes. If it is not possible to get valid measurement results over the whole frequency range indicated, the results are given in a restricted frequency range, and the reasons for the restriction(s) are clearly reported.

For indoor measurements, see Annex D.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. 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 14389:2023, *Road traffic noise reducing devices — Procedures for assessing long term performance*

EN 61672-1, *Electroacoustics — Sound level meters — Part 1: Specifications*

ISO/IEC Guide 98-3:2008, *Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*