
Protihrupne ovire za cestni promet - Neakustične lastnosti - 2. del: Metode ugotavljanja splošnih značilnosti glede varnosti in varovanja okolja

Road traffic noise reducing devices - Non-acoustic performance - Part 2: Methods of determination of the general safety and environmental characteristics

Lärmschutzvorrichtungen an Straßen - Nichtakustische Eigenschaften - Teil 2: Methoden zur Bestimmung der allgemeinen Sicherheits- und Umwelteigenschaften

Dispositifs de réduction du bruit du trafic routier - Performances non acoustiques - Partie 2 : Méthodes de détermination des caractéristiques générales de sécurité et des caractéristiques environnementales

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ICS:

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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

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Road traffic noise reducing devices - Non-acoustic performance - Part 2: Methods of determination of the general safety and environmental characteristics

Dispositifs de réduction du bruit du trafic routier - Performances non acoustiques - Partie 2 : Méthodes de détermination des caractéristiques générales de sécurité et des caractéristiques environnementales

Lärmschutzvorrichtungen an Straßen - Nichtakustische Eigenschaften - Teil 2: Methoden zur Bestimmung der allgemeinen Sicherheits- und Umwelteigenschaften

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 226.

If this draft becomes a European Standard, 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.

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

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European foreword

This document (prEN 1794-2:2021) has been prepared by Technical Committee CEN/TC 226 “Road equipment”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 1794-2:2020.

This document is part of a series that consists of the following parts under the general title “*Road traffic noise reducing devices — Non-acoustic performance*”:

- *Part 1: Methods of determination of the mechanical and stability characteristics*
- *Part 2: Methods of determination of the general safety and environmental characteristics*
- *Part 3: Reaction to fire – Burning behaviour of noise reducing devices and classification*

The main change compared to the previous edition is:

- The Annexes A to F: the acceptance criteria given in the previous version of this standard have been deleted and transferred to EN 14388:2021.

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prEN 1794-2:2021 (E)**Introduction**

While performing their primary function, road traffic noise reducing devices should not pose hazards to road users or other people in the vicinity or to the environment at large. Noise reducing devices should not reflect light in such a way as to prejudice road safety. They should be made from materials which do not emit noxious fumes or leachates as the result of natural or industrial processes, or as the result of fire. Noise reducing devices should allow a means of escape by road users and access by operatives in the event of an emergency or for maintenance.

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1 Scope

This document specifies methods and criteria for assessing the general safety and environmental performance of road traffic noise reducing devices under typical roadside conditions. Appropriate test methods are provided where these are necessary. The treatment of each topic is covered separately in Annexes A to E.

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.

prEN 1794-1:2021, *Road traffic noise reducing devices - Non-acoustic performance - Part 1: Mechanical performance and stability requirements*

EN ISO 2813:2014, *Paints and varnishes - Determination of gloss value at 20°, 60° and 85° (ISO 2813:2014)*

3 Terms, definitions and symbols

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at <https://www.electropedia.org/>

— ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1.1

road traffic noise reducing device

RTNRD

device designed to reduce the propagation of traffic noise away from the road environment

Note 1 to entry: The NRD may comprise acoustic elements (3.1.2) only or both structural (3.1.3) and acoustic elements.

Note 2 to entry: Applications of NRD include noise barriers (3.1.4), claddings(3.1.5), covers (3.1.6) and added devices(3.1.7).

3.1.2

acoustic element

element whose primary function is to provide the acoustic characteristic of the device

3.1.3

structural element

element whose primary function is to support or hold in place acoustic elements

3.1.4

noise barrier

noise reducing device which obstructs the direct transmission of airborne sound emanating from road traffic

prEN 1794-2:2021 (E)**3.1.5****cladding**

noise-reducing device which is attached to a wall or other structure and reduces the amount of sound reflected

3.1.6**cover**

noise-reducing device which either spans or overhangs the road

3.1.7**added device**

additional component that influences the acoustic characteristic of the original noise-reducing device

Note 1 to entry: The added device is acting primarily on the diffracted energy.

3.2 Symbols

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

ϕ_m	angle at which reflections from the surface of the transparent material obscure the view through the material, in degrees;
ϕ_0	angle between the visual axis and the normal to the noise reducing device (see Figure F.2) in degrees;
θ	angle of incidence
α_n	angle of transparency (see Figure F.2) in degrees;
α	angle (see Figure B.1)
β_n	angle of opacity (see Figure F.2) in degrees;
η	angle of the transparent elements
μ	terms of refractive index
t_θ	function of the angle of incidence
K_A	visual acuity factor (see Figure F.1) in degrees;
k	Parameter
L_T	light transmission index (as determined in accordance with EN 410 or EN 2155-5), in percent;
L_T'	overall transparency for different material thickness t'
$L_T/100$	coefficient
r	radius (see Figure B.1)
S_O	area of opaque features within transparent elements, in square millimetres;
S_T	total area of transparent elements, including horizontal features, in square millimetres;
t/t'	material thickness/ different material thickness
T	transparency, in percent;
T_r	transparency looking right, in percent;
T_l	transparency looking left, in percent;

T_D	dynamic transparency, in percent;
T_S	static transparency, in percent.
u_i	estimated uncertainties
u_T	sum of the estimated combined uncertainties
u_T^2	the square of the uncertainty in T
w_i	weights

4 Characteristics

4.1 Safety in case of brushwood fire

The safety in case of brushfire shall be determined in accordance with Annex A.

4.2 Resistance to dynamic loads: risk of falling debris

When secondary safety has to be determined, this shall be done in accordance with Annex B.

4.3 Environmental protection

The constituent materials and their breakdown products shall be identified in accordance with Annex C.

4.4 Access for maintenance and emergency exits

The acoustic and mechanical performances of doors or other means of escape shall be determined in accordance with Annex D.

4.5 Light reflection

The results of a standard test of reflectivity shall be determined in accordance with Annex E.

4.6 Transparency

The results of a standard test of transparency should be determined in accordance with Annex F.

5 Test report

Every test report on aspects of performance shall include the following information:

- a) number and year of this document;
- b) full description of the element or system tested, including manufacturer(s), part numbers, place and date of origin;
- c) description of the method of sampling, description of the sampling procedure, if the performance is determined by parts of manufactured elements;
- d) place and date of determination, and the name of the responsible person(s);
- e) sufficient description of any tests carried out, any results measured and the conclusions drawn about the product together with any illustrations or photographs, all as specified in the appropriate annex.

Annex A (normative)

Safety in case of brushwood fire

A.1 General

A road traffic noise reducing device can be exposed to fire arising from dry vegetation or other material in close proximity. More severe fires from spilt fuel can arise as the result of traffic accidents.

Where a road traffic noise reducing device is in close proximity to property it can also be necessary to consider the need to ensure that fire is not spread from the highway.

Where flammable systems are used, it is recommended that firebreaks of fire-resistant materials or other design are incorporated into the road traffic noise reducing device in order to prevent the propagation of fire. This annex is not applicable to such fire resistant material.

This annex describes a test for a representative panel of a vertical noise barrier under normal exposure to brushwood fires at the roadside.

It does not provide information on the results of exposure to more severe conditions, e.g. ignition by burning spilt fuel. The test should not be used to provide information on the fire safety of claddings used for tunnels or partial covers over the highway.

A.2 Fire test

A.2.1 Acoustic elements of at least 2 m long by 1,5 m high shall be tested by exposure to localised sources of fire at its base next to the front and rear faces independently. Panels shall be free of absorbed water before testing; in the case of timber components, the moisture content shall be reduced to 18 % by an approved drying method.

The mass and dimensions of the panel to be tested shall be measured and the panel shall be photographed. An identical panel shall be examined to determine its construction; the dimensions of its elements, including wall thickness of hollow sections, shall be measured and noted on a sketch at 1:20 scale.

A.2.2 Testing shall be carried out in an enclosed fireproof and draught-free chamber having a volume of at least 150 m³.

Fume extraction devices may be installed in or near the ceiling, but shall be prevented from fanning any flames during the test.

The temperature of the chamber, including the floor, before the test begins shall be between 15 °C and 25 °C. The chamber should be fitted with an observation port or window in a suitable position to observe the panel during the test.

A.2.3 Two identical sources of fire shall be prepared as follows:

- a) a rectilinear wire mesh basket 300 mm by 200 mm by 300 mm high shall be made from welded steel wire mesh, having a square mesh of 3 mm diameter drawn steel wire at 50 mm centres ;
- b) in addition, three 3 mm diameter wires 300 mm long shall be secured in a vertical position inside the basket, equispaced along the central line of the shorter dimension.

The flammable material shall comprise shavings of spruce, 0,2 mm thick by 2 mm wide, and approximately 50 mm long. The material shall be free from splinters and have a maximum moisture content of 30 % ; it shall be acclimatised at 20 °C and 65 % humidity until its weight is constant.

600 g of shavings shall be lightly pressed down into each basket so that it is just filled.

A.2.4 The test panel shall be supported in a vertical position corresponding to its orientation in use, on a plinth supporting the full length of the panel. The plinth shall be of masonry or concrete and have a vertical step to a level of 250 mm above the floor of the chamber. The base of the test panel shall be completely in contact with the plinth and the face to be tested shall be flush with the edge. The two sources of fire shall be placed on the floor of the chamber with their longer dimension flush against the plinth and the face of the test panel. Both sources shall be lit simultaneously, and the time taken for the test shall start at this point.

A.2.5 The performance of the panel shall be observed during the test and the time at which any significant change takes place recorded. After the sources of fire and any part of the panel which may have ignited have burnt out, the panel shall be examined and the extent of any damage photographed and measured. The opposite face of the panel shall not be tested until it and the floor of the chamber have cooled to below 25 °C.

A.3 Test report

A.3.1 The test procedure shall be described together with the timing of significant stages, indication of, for example maximum intensity of flames, the incidence of any observed changes to the test panel and the number of samples tested.

The test report shall record the nature and extent of any flames and smoke produced during the test.

A.3.2 Photographs of the test panel before, during and after the test shall be supplied and shall include an appropriate means of judging scale.

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