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Protihrupne ovire za cestni promet - Neakustične lastnosti – 2. del: Splošne zahteve za varnost in varstvo okolja

Road traffic noise reducing devices - Non-acoustic performance - Part 2: General safety and environmental requirements

Lärmschutzeinrichtungen an straßen - Nichtakustische Eigenschaften - Teil 2: Allgemeine Sicherheits - und Umweltanforderungen

Dispositifs de réduction du bruit du trafic routier - Performances non acoustiques - Partie 2: Exigences générales pour la sécurité et l'environnement

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Road traffic noise reducing devices - Non-acoustic performance - Part 2: General safety and environmental requirements

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This European Standard was approved by CEN on 2 January 2003.

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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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

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Foreword

This document (EN 1794-2:2003) 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of an identical text or by endorsement, at the latest by October 2003, and conflicting national standards shall be withdrawn at the latest by October 2003.

This document supersedes EN 1794-2:1998.

This European standard consists of the following parts under the general title "Road traffic noise reducing devices - Non-acoustic performance" :

— *Part 1 : Mechanical performance and stability requirements*

— *Part 2 : General safety and environmental requirements*

Annexes A to E of this part of EN 1794 are normative and annex F is informative.

Another standard covering long term durability (service life) is in course of preparation.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

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 assist the spread of fire from adjacent verges or nearby land. Fire resistance in accordance with particular standards can in addition be required to minimise risk to adjacent premises, or to road users in confined corridors. 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.

Noise reducing devices are not in general expected to resist the impact of vehicles, but designers can need information about the consequences of such impact load to establish the requirements for protection of road users and passers by.

1 Scope

This European Standard specifies minimum requirements and other criteria for assessing the general safety and environmental performance of road traffic noise reducing devices under typical roadside conditions. Requirements for more onerous conditions are a matter for consideration by the designer. Appropriate test methods are provided where these are necessary, but for some aspects a declaration of material characteristics may be required for the information of designers. The treatment of each topic is covered separately in annexes A to F.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 410, *Glass in building - Determination of luminous and solar characteristics of glazing.*

EN 1794-1: 2003, *Road traffic noise reducing devices - Non-acoustic performance - Part 1: Mechanical performance and stability requirements.*

EN 2155-5, *Aerospace series -Test methods for transparent materials for aircraft glazing – Part 5: Determination of visible light transmission.*

EN ISO 2813, *Paints and varnishes - Determination of specular gloss of non-metallic paint films at 20°, 60° and 85° (ISO 2813:1994, including Technical Corrigendum 1:1997)*

3 Terms, definitions and symbols

3.1 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply:

3.1.1
noise barrier
noise reducing device which obstructs the direct transmission of airborne sound emanating from road traffic

3.1.2
cladding
noise reducing device which is attached to a wall or other structure to reduce the amount of sound reflected

3.1.3
cover
noise reducing device which either spans or overhangs the highway

3.1.4
structural element
element whose primary function is to support or hold in place acoustic elements

3.1.5
acoustic element
element whose primary function is to provide the acoustic performance of the device

3.2 Symbols

α_m angle at which reflections from the surface of the transparent material obscure the view through the material, in degree ;

α_n angle of transparency (see Figure F.1), in degrees ;

$ß_n$ angle of opacity (see Figure F.1), in degrees ;

K_A visual acuity factor (see Figure F.2), in degrees ;

L_T light transmission index (as determined in accordance with EN 410 or EN 2155-5), in per cent ;

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 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.

4 Requirements

4.1 Resistance to brush fire

The noise reducing device shall be classified in accordance with annex A.

NOTE This European Standard permits specifying authorities to indicate that there is no requirement for resistance to brushwood fire.

4.2 Secondary safety (falling debris)

When a secondary safety has to be assessed, this shall be done in accordance with annex B.

NOTE This European Standard permits specifying authorities to indicate that there is no requirement for secondary safety.

4.3 Environmental protection

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

NOTE This European Standard permits specifying authorities to indicate that there is no requirement for environmental protection.

4.4 Means of escape in emergency

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

NOTE This European Standard permits specifying authorities to indicate that there is no requirement for means of escape in emergency.

4.5 Reflection of light

The results of a standard test of reflectivity shall be quoted in accordance with annex E.

NOTE This European Standard permits specifying authorities to indicate that there is no requirement for light reflection.

4.6 Transparency

The results of a standard test of transparency should be quoted in accordance with annex F.

NOTE This European Standard permits specifying authorities to indicate that there is no requirement for transparency.

5 Test report

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

a) number and year of this European Standard, EN 1794-2:2003 ;

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, if parts of manufactured elements are evaluated by testing ;

d) place and date of assessment, and the name of the assessor ;

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.

5.2 A summary report shall be produced, identifying the aspects of performance for which detailed reports are available and the level of performance assessed, where appropriate.

Annex A
(normative)

Resistance to brushwood fire

A.1 General

A 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 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 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 Requirements

The noise reducing device, after being tested by the method given in A.3, shall be classified as follows :

— class 1 : if the panel has been damaged to a greater extent than as defined for classes 2 and 3 ;

— class 2 : if the damaged area above either source is less than 0.06 m^2 and extends to no more than 200 mm above the base of the panel, and the panel has not been burnt through to the other side ;

— class 3 : if there is no damage other than discoloration.

A.3 Fire test

A.3.1 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.3.2 Testing shall be carried out in an enclosed fireproof and draught-free chamber having a volume of at least 150 m^3.

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.3.3 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.3.4 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.3.5 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.4 Test report

A.4.1 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.4.2 Photographs of the test panel before, during and after the test shall be supplied and shall include an appropriate means of judging scale.