

Road traffic noise reducing devices — Non-acoustic performance —

Part 1: Mechanical performance and stability requirements

The European Standard EN 1794-1:2003 has the status of a
British Standard

ICS 93.080.30

National foreword

This British Standard is the official English language version of EN 1794-1:2003. It supersedes BS EN 1794-1:1998 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee B/509, Road equipment, to Subcommittee B/509/6, Fences for attenuation of noise, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 25 April 2003

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 24 an inside back cover and a back cover.

The BSI copyright date displayed in this document indicates when the document was last issued.

Amendments issued since publication

Amd. No.	Date	Comments

© BSI 25 April 2003

ISBN 0 580 41734 4

English version

Road traffic noise reducing devices - Non-acoustic performance - Part 1: Mechanical performance and stability requirements

Dispositifs de réduction du bruit du trafic routier -
Performances non-acoustiques - Partie 1: Performances
mécaniques et exigences en matières de stabilité

Lärmschutzeinrichtungen an Straßen - Nichtakustische
Eigenschaften - Teil 1: Mechanische Eigenschaften und
Anforderungen an die Standsicherheit

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

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Foreword

This document (EN 1794-1:2003) 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of an identical text or by endorsement, at the latest by October 2003, and conflicting national standards shall be withdrawn at the latest by October 2003.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 1794-1:1998.

This European Standard consists of the following parts under the general title "Road traffic noise reducing devices – Non acoustic performance".

¾ Part 1 : Mechanical performance and stability requirements

¾ Part 2 : General safety and environmental requirements

Annexes A to E of this part of EN 1794 are normative.

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 are exposed to a range of forces due to wind, dynamic air pressure caused by passing traffic, and the self weight of its component parts. They can also be subjected to shocks caused by stones or other debris thrown up by vehicle tyres and, in some countries, the dynamic force of snow ejected by equipment used to clear roads in winter. The deflections of a noise reducing device under such loads during its design life should not reduce its effectiveness.

1 Scope

This European Standard provides criteria to categorise road traffic noise reducing devices according to basic mechanical performance under standard conditions of exposure, irrespective of the materials used. A range of conditions and optional requirements is provided to allow for the wide diversity of practice within Europe. Individual aspects of performance are covered separately in the annexes. Safety considerations in the event of damage to noise reducing devices are covered in Part 2 of this European Standard.

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).

ENV 1991 -2-4, Eurocode 1, *Basis of design and actions on structures: Part 2 -4 : Actions on structures - Wind actions*.

EN 1317-1, *Road restraint systems - Part 1: Terminology and general criteria for test methods*.

EN 1317-2, *Road restraint systems - Part 2: Performance classes, impact test acceptance criteria and test methods for safety barriers*.

EN 1794-2: 2003, *Road traffic noise reducing devices - Non acoustic performance - Part 2: General safety and environmental requirements*.

3 Terms and definitions

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

3.1

noise barrier

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

3.2

cladding

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

3.3

cover

noise reducing device which either spans or overhangs the highway

3.4

structural element

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

3.5

acoustic element

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

3.6

mechanical test hammer

device of the type used for measuring the elasticity of hard surfaces

3.7

test area

central area of a full size panel enclosed by a margin of 125 mm from each edge, as shown in Figure C.2

3.8

vehicle occupants safe device

traffic safe noise reducing device for which a vehicle impact does not cause more danger to the occupants than allowed for safety barriers in EN 1317-2. However, it does not need to prevent the vehicle from going through it, nor is it presumed that parts of the device are prevented from becoming detached

3.9

combined safety and noise barrier

traffic safe noise reducing device which fulfils all the requirements for safety barriers in a given containment class as defined in EN 1317-2

3.10

dynamic load

load due to snow thrown against a noise reducing device by snow ploughing equipment

3.11

ploughing speed

speed of the snow ploughing equipment as it passes the noise barrier

4 Symbols and abbreviations

$C_e(z)$	exposure coefficient
C_p	pressure coefficient
d	deflection, in millimetres
d_{hmax}	horizontal maximum deflection, in millimetres
d_{vmax}	vertical maximum deflection, in millimetres
h	total height of acoustic elements, in millimetres
L	length of elements, in millimetres
L_S	greatest length of structural element, in millimetres
L_A	greatest length of acoustic element, in millimetres
$q_{(v)}$	dynamic pressure due to passing vehicles, in pascals
S	load factor
S_g	load factor (weight)
S_w	load factor (wind)
V_{ref}	mean wind velocity at height z , in metres per second
W	wind pressure, in pascals
z	height above the ground, in metres

air density, in kilograms per cubic metre

5 Requirements

5.1 Wind load and static load

Limiting values for elastic and permanent deflections shall not exceed the values specified in annex A.

To ensure connections do not fail load factors shall be applied in accordance with annex A.

NOTE This European Standard permits specifying authorities to indicate that there is no requirement for resistance to wind or static load.

5.2 Self weight

Under standard conditions the deflections shall not exceed the limiting values given in annex B.

NOTE This European Standard permits specifying authorities to indicate that there is no requirement for an element of a noise reducing device to support its own weight or the weight of other elements.

5.3 Impact of stones

Damage caused by controlled impacts shall not exceed the criteria specified in annex C.

NOTE This European Standard permits specifying authorities to indicate that there is no requirement for resistance to the impact of stones.

5.4 Safety in collision

When safety in collision has to be assessed, the behaviour under impacts specified in EN 1317-2 shall be classified in accordance with annex D.

NOTE This European Standard permits specifying authorities to indicate that there is no requirement for verification of safety in the event of an impact by an errant vehicle.

5.5 Dynamic forces from snow clearance

When the effects of dynamic forces from snow clearance have to be assessed, this shall be done in accordance with annex E.

NOTE This European Standard permits specifying authorities to indicate that there is no requirement for resistance to the force of snow thrown sideways by clearance equipment.

6 Test report

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

- a) number and year of this European Standard, EN 1794-1 : 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 the assessment, and the name of the assessor ;