SLOVENSKI STANDARD
SIST EN 14388:2015

01-december-2015

Nadomešča:
SIST EN 14388:2005
SIST EN 14388:2005/AC:2008

Protihrupne ovire za cestni promet - Specifikacije

Road traffic noise reducing devices - Specifications

Lärmschutzvorrichtungen an Straßen - Vorschriften

Dispositifs de réduction du bruit du trafic routier - Spécifications

Ta slovenski standard je istoveten z: **EN 14388:2015**

ICS:

93.080.30	Cestna oprema in pomožne naprave	Road equipment and installations

SIST EN 14388:2015 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 14388

September 2015

ICS 93.080.30

Supersedes EN 14388:2005

English Version

Road traffic noise reducing devices - Specifications

Dispositifs de réduction du bruit du trafic routier - Spécifications

Lärmschutzvorrichtungen an Straßen - Vorschriften

This European Standard was approved by CEN on 12 December 2014.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN 14388:2015 E

Contents

Page

European foreword

This document (EN 14388:2015) 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 March 2016 and conflicting national standards shall be withdrawn at the latest by June 2017.

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 14388:2005.

The main changes compared to the previous edition are:

- Two standards EN 1793-2 and EN 1793-6 are now specified for the measurement of airborne sound insulation, each with a specific field of application.
- Revision of Annex ZA according to Regulation EU 305/2011.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of the EU Construction Products Regulation.

For relationship with the EU Construction Products Regulation, see informative Annex ZA, which is an integral part of this document.

According to the CEN-CENELEC Internal Regulations, the national standards organizations 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.

1 Scope

This European Standard specifies requirements for the following road traffic noise reducing devices (as defined in 3.1):

- noise barriers (as defined in 3.2);
- claddings (as defined in 3.5);
- road covers (as defined in 3.6); and
- added devices (as defined in 3.7).

These devices may include both acoustic and structural elements, where:

- an acoustic element is an element whose primary function is to provide a noise reducing device with sound insulation, diffraction and/or sound absorption, it is a part of noise reducing device to be used along roads, and
- a structural element is an element whose primary function is to support or hold in place acoustic elements, it is a part of noise reducing device to be used along roads. Depending upon the design of the noise reducing device, structural elements may potentially be tested separately from acoustic elements.

They may be made of different materials for which specific standards are to be applied in accordance with the specifications prescribed hereafter. Some of the materials may contain dangerous substances, the reason why all the materials are declared.

This European Standard identifies the relevant characteristics of road traffic noise reducing devices, the corresponding methods of evaluation and specifies the provisions on evaluation of conformity and marking.

This European Standard covers acoustic, non-acoustic and long term performance, but not aspects such as resistance to vandalism or requirements of visual appearance.

This European Standard does not cover road surfaces or the airborne sound insulation of houses.

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 1317-2, *Road restraint systems — Part 2: Performance classes, impact test acceptance criteria and test methods for safety barriers including vehicle parapets*

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

EN 1793-2, *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*

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*

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*

EN 1794-1:2011, *Road traffic noise reducing devices — Non-acoustic performance — Part 1: Mechanical performance and stability requirements*

EN 1794-2:2011, *Road traffic noise reducing devices — Non-acoustic performance — Part 2: General safety and environmental requirements*

EN 14389-1, *Road traffic noise reducing devices — Procedures for assessing long term performance — Part 1: Acoustical characteristics*

EN 14389-2, *Road traffic noise reducing devices — Procedures for assessing long term performance — Part 2: Non-acoustical characteristics*

3 Terms and definitions

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

3.1
noise reducing device (NRD)
device designed to reduce the propagation of traffic noise away from the road environment

Note 1 to entry: This may be a noise barrier, cladding, a road cover or an added device. These devices may include both acoustic and structural elements.

3.2
noise barrier
noise reducing device which obstructs the direct transmission of airborne sound emanating from road traffic

3.3
acoustic element
element whose primary function is to provide the acoustic performance of the device

3.4
structural element
element whose primary function is to support or hold in place acoustic elements

3.5
cladding
noise-reducing device which is attached to a wall or other structure and reduces the amount of sound reflected

3.6
cover
noise-reducing device which either spans or overhangs the highway

3.7
added device
added component that influences the acoustic performance of the original noise-reducing device (acting primarily on the diffracted energy)

4 Requirements

4.1 General

Products covered by the standard, when required, shall be tested in accordance with the supporting standards indicated in Table 1, Table 2, Table 3, Table 4 and Table 5.

The test methods or calculation methods referred to in Table 1, Table 2, Table 3, Table 4 and Table 5 generate declared performance only. On this basis, compliance criteria are not relevant.

Table 1 — Noise barriers: Required test methods and declared values

Characteristic	Test method or calculation	Declared value	Amount of samples
Sound absorption DL_α[a]	EN 1793–1 (test)	dB, on specified absorptive side(s) of the barrier	1
Airborne sound insulation			
DL_R in reverberant fields[b]	EN 1793–2 (test)	dB	1
$DL_{SI,E}$, $DL_{SI,P}$ and $DL_{SI,G}$ in non-reverberant fields[c]	EN 1793–6 (test)	dB	1
Resistance to loads			
Self weight of an acoustic element: wet, reduced wet or dry as defined in EN 1794–1:2011, B.2:	EN 1794–1:2011, Annex B (test or calculation)	kN/element for specified condition: wet, reduced wet or dry	1 if tested
Maximum vertical load an element can withstand in order to fulfil EN 1794–1:2011, B.3.2: (load from upper elements)	EN 1794–1:2011, Annex B (test or calculation)	kN/m along the acoustic element	1 if tested
Maximum normal (90°) load an acoustic element can withstand in order to fulfil EN 1794–1:2011, A.3.3: (wind and static load)	EN 1794–1:2011, Annex A (test or calculation)	kPa on the element	1 if tested
Maximum normal (90°) load a structural element can withstand in order to fulfil EN 1794–1:2011, A.3.2 and B.3.3: (wind, static load and self weight)	EN 1794–1:2011, Annex A and B (calculation)	kN/m along the structural element, for specified barrier heights (h)	Not applicable
Maximum bending moment a structural element can withstand in order to fulfil EN 1794–1:2011, E.2: (dynamic load from snow clearance)	EN 1794–1:2011, Annex E (test or calculation)	kNm at ground level	1 if tested
Maximum normal (90°) load an acoustic element can withstand in order to fulfil EN 1794–1:2011, E.2: (dynamic load from snow clearance)	EN 1794–1:2011, Annex E (test or calculation)	kN on a 2m x 2m reference surface on the acoustic element	1 if tested
Resistance to brush fire	EN 1794–2:2011, Annex A (test)	Class 1 to 3	1
Shatter properties	EN 1794–2:2011, Annex B (test)	Class 1 to 4	1
Light Reflectivity			
The value of reflectivity measured in accordance with EN 1794–2:2011, E.3:	EN 1794–2:2011, Annex E (test)	Class 1 to 3	1
Release of dangerous substances	4.2 of this standard and EN 1794–2:2011, Annex C	As relevant, in accordance with 4.2	As relevant, in accordance with 4.2

Characteristic	Test method or calculation	Declared value	Amount of samples
Durability			
Acoustic parameters, DL_α, DL_R and DL_{SI} (as appropriate)	EN 14389–1	dB after 5 years, 10 years, 15 years and 20 years	Not applicable
Non acoustic parameters (working life when subject to environmental conditions)	EN 14389–2	Declared lifetime (years)	Not applicable
Impact of stones[d]			
Damage caused by controlled impacts	EN 1794–1:2011, Annex C (test)	Succeed or fail	1
Safety in collision[e]			
Behaviour under impacts specified in EN 1317–2	EN 1794–1:2011, Annex D (test)	Succeed or fail	1
Environmental protection			
Identification of constituent materials and breakdown products	EN 1794–2:2011, Annex C	Material details	Not applicable
Transparency[f]			
Assessment in accordance with supporting standard	EN 1794–2:2011, Annex F (test and calculation)	Static and/or dynamic	1

a Only applicable if the device is described as sound absorptive

b Applicable if the device is intended to be used in reverberant fields

c Applicable if the device is intended to be used in non-reverberant fields

d Optional

e Optional except if combined safety and noise barrier

f Optional

Table 2 — Cladding: Required test methods and declared values

Characteristic	Test method or calculation	Declared value	Amount of samples
Sound absorption DLα[a]	EN 1793–1 (test)	dB, on specified absorptive side(s) of the barrier	1
Resistance to loads			
Self weight of an acoustic element: wet, reduced wet or dry as defined in EN 1794–1:2011, B.2:	EN 1794–1:2011, Annex B (test or calculation)	kN/element for specified condition: wet, reduced wet or dry	1 if tested
Maximum vertical load an element can withstand in order to fulfil EN 1794–1:2011, B.3.2: (load from upper elements)	EN 1794–1:2011, Annex B (test or calculation)	kN/m along the acoustic element	1 if tested
Maximum normal (90°) load an acoustic element can withstand in order to fulfil EN 1794–1:2011, A.3.3 (wind and static load)	EN 1794–1:2011, Annex A (test or calculation)	kPa on the element	1 if tested
Maximum normal (90°) load an acoustic element can withstand in order to fulfil EN 1794–1:2011, E.2: (dynamic load from snow clearance)	EN 1794–1:2011, Annex E (test or calculation)	kN on a 2m x 2m reference surface on the acoustic element	1 if tested
Resistance to brush fire	EN 1794–2:2011, Annex A (test)	Class 1 to 3	1
Shatter properties	EN 1794–2:2011, Annex B (test)	Class 1 to 4	1
Light Reflectivity			
The value of reflectivity measured in accordance with EN 1794–2:2011, E.3:	EN 1794–2:2011, Annex E (test)	Class 1 to 3	1
Release of dangerous substances	4.2 of this standard and EN 1794–2:2011, Annex C	As relevant, in accordance with 4.2	As relevant, in accordance with 4.2
Durability			
Acoustic parameters, DL_α, DL_R and DL_{SI} (as appropriate)	EN 14389–1	dB after 5 years, 10 years, 15 years and 20 years	Not applicable
Non acoustic parameters (working life when subjected to environmental conditions)	EN 14389–2	Declared lifetime (years)	Not applicable
Impact of stones[b]			
Damage caused by controlled impacts	EN 1794–1:2011, Annex C (test)	Succeed or fail	1
Safety in collision[c]			
Behaviour under impacts specified in EN 1317–2	EN 1794–1:2011, Annex D (test)	Succeed or fail	1
Environmental protection			
Identification of constituent materials and breakdown products	EN 1794–2:2011, Annex C	Material details	Not applicable

a Only applicable if the device is described as sound absorptive

b Optional

c Optional except if combined safety and noise barrier

Table 3 — Covers: Required test methods and declared values

Characteristic	Test method or calculation	Declared value	Amount of samples
Sound absorption DL_{α}[a]	EN 1793–1 (test)	dB, on specified absorptive side(s) of the barrier	1
Airborne sound insulation			
DL_R in reverberant fields[b]	EN 1793–2 (test)	dB	1
$DL_{SI,E}$, $DL_{SI,P}$ and $DL_{SI,G}$ in non-reverberant fields[c]	EN 1793–6 (test)	dB	1
Resistance to loads			
Self weight of an acoustic element: wet, reduced wet or dry as defined in EN 1794–1:2011, B.2:	EN 1794–1:2011, Annex B (test or calculation)	kN/element for specified condition: wet, reduced wet or dry	1 if tested
Maximum vertical load an element can withstand in order to fulfil EN 1794–1:2011, B.3.2: (load from upper elements)	EN 1794–1:2011, Annex B (test or calculation)	kN/m along the acoustic element	1 if tested
Maximum normal (90°) load an acoustic element can withstand in order to fulfil EN 1794–1:2011, A.3.3: (wind and static load)	EN 1794–1:2011, Annex A (test or calculation)	kPa on the element	1 if tested
Maximum normal (90°) load a structural element can withstand in order to fulfil EN 1794–1:2011, A.3.2 and B.3.3: (wind, static load and self weight)	EN 1794–1:2011, Annex A and B (calculation)	kN/m along the structural element, for specified barrier heights (h)	Not applicable
Resistance to brush fire	EN 1794–2:2011, Annex A (test)	Class 1 to 3	1
Shatter properties	EN 1794–2:2011, Annex B (test)	Class 1 to 4	1
Light Reflectivity			
The value of reflectivity measured in accordance with EN 1794–2:2011, E.3:	EN 1794–2:2011, Annex E (test)	Class 1 to 3	1
Release of dangerous substances	4.2 of this standard and EN 1794–2:2011, Annex C	As relevant, in accordance with 4.2	As relevant, in accordance with 4.2
Durability			
Acoustic parameters, DL_{α}, DL_R and DL_{SI} (as appropriate)	EN 14389–1	dB after 5 years, 10 years, 15 years and 20 years	Not applicable
Non acoustic parameters (working life when subjected to environmental conditions)	EN 14389–2	Declared lifetime (years)	Not applicable
Impact of stones[d]			
Damage caused by controlled impacts	EN 1794–1:2011, Annex C (test)	Succeed or fail	1
Environmental protection			
Identification of constituent materials and breakdown products	EN 1794–2:2011, Annex C	Material details	Not applicable

Characteristic	Test method or calculation	Declared value	Amount of samples
Transparency[e] Assessment in accordance with supporting standard	EN 1794–2:2011, Annex F (test and calculation)	Static and/or dynamic	1

a Only applicable if the device is described as sound absorptive

b Applicable if the device is intended to be used in reverberant fields

c Applicable if the device is intended to be used in non-reverberant fields

d Optional

e Optional

Table 4 — Structural elements (if tested separately): Required test methods and declared values

Characteristic	Test method or calculation	Declared value	Amount of samples
Resistance to loads			
Maximum vertical load an element can withstand in order to fulfil EN 1794–1:2011, B.3.2: (load from upper elements)	EN 1794–1:2011, Annex B (test or calculation)	kN/m along the acoustic element	1 if tested
Maximum normal (90°) load a structural element can withstand in order to fulfil EN 1794–1:2011, A.3.2 and B.3.3: (wind, static load and self weight)	EN 1794–1:2011, Annex A and B (calculation)	kN/m along the structural element, for specified barrier heights (h)	Not applicable
Maximum bending moment a structural element can withstand in order to fulfil EN 1794–1:2011, E.2: (dynamic load from snow clearance)	EN 1794–1:2011, Annex E (test or calculation)	kNm at ground level	1 if tested
Resistance to brush fire	EN 1794–2:2011, Annex A (test)	Class 1 to 3	1
Shatter properties	EN 1794–2:2011, Annex B (test)	Class 1 to 4	1
Light Reflectivity			
The value of reflectivity measured in accordance with EN 1794–2:2011, E.3:	EN 1794–2:2011, Annex E (test)	Class 1 to 3	1
Release of dangerous substances	4.2 of this standard and EN 1794–2:2011, Annex C	As relevant, in accordance with 4.2	As relevant, in accordance with 4.2
Durability			
Non acoustic parameters (working life when subjected to environmental conditions)	EN 14389–2	Declared lifetime (years)	Not applicable
Impact of stones[a]			
Damage caused by controlled impacts	EN 1794–1:2011, Annex C (test)	Succeed or fail	1
Safety in collision[b]			
Behaviour under impacts specified in EN 1317–2	EN 1794–1:2011, Annex D (test)	Succeed or fail	1
Environmental protection			
Identification of constituent materials and breakdown products	EN 1794–2:2011, Annex C	Material details	Not applicable

[a] Optional

[b] Optional except if combined safety and noise barrier