
Železniške naprave - Zgornji ustroj proge - Protihrupne ovire in pripadajoče naprave, ki vplivajo na širjenje zvoka v zraku - Neakustične lastnosti - 3. del: Splošne varnostne in okoljske zahteve

Railway applications - Track - Noise barriers and related devices acting on airborne sound propagation - Non-acoustic performance - Part 3: General safety and environmental requirements

Bahnanwendungen - Oberbau - Lärmschutzwände und verwandte Vorrichtungen zur Beeinflussung der Luftschallausbreitung - Nicht akustische Eigenschaften - Teil 3: Allgemeine sicherheits- und umweltbezogene Anforderungen

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Applications ferroviaires - Voie - Écrans antibruit et dispositifs connexes influant sur la propagation aérienne du son - Performances non acoustiques - Partie 3 : Exigences générales pour la sécurité et l'environnement

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Railway applications - Track - Noise barriers and related devices acting on airborne sound propagation - Non-acoustic performance - Part 3: General safety and environmental requirements

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EN 16727-3:2017 (E)**European foreword**

This document (EN 16727-3:2017) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by July 2017 and conflicting national standards shall be withdrawn at the latest by July 2017.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 European Standard is one of the series EN 16727 “Railway applications — Track — Noise barriers and related devices acting on airborne sound propagation — Non-acoustic performance” as listed below:

- *Part 1: Mechanical performance under static loadings — Calculation and test methods*
- *Part 2-1: Mechanical performance under dynamic loadings due to passing trains — Resistance to fatigue*
- *Part 2-2: Mechanical performance under dynamic loadings caused by passing trains — Calculation method*
- *Part 3: General safety and environmental requirements*

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prEN 16727-1, *Railway applications — Track — Noise barriers and related devices acting on airborne sound propagation — Non-acoustic performance — Part 1: Mechanical performance under static loadings — Calculation and test methods*

prEN 16727-2-1, *Railway applications — Track — Noise barriers and related devices acting on airborne sound propagation — Non-acoustic performance — Part 2-1: Mechanical performance under dynamic loadings due to passing trains — Resistance to fatigue*

EN 16727-2-2, *Railway applications — Track — Noise barriers and related devices acting on airborne sound propagation — Non-acoustic performance — Part 2-2: Mechanical performance under dynamic loadings caused by passing trains — Calculation method*

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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

While performing their primary function, noise barriers and related devices acting on airborne sound propagation installed along railways should not pose hazards to rail users or other people in the vicinity or to the environment at large. Noise barriers and related 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 minimize risk to adjacent premises, or to rail users in confined corridors. Noise barriers and related devices should not reflect light towards train drivers in such a way as to compromise rail 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 barriers should allow a means of escape by rail users and access by operatives in the event of an emergency.

Noise barriers and related devices acting on airborne sound propagation are not, in general, expected to resist the impact of vehicles, but designers can utilize information about the consequences of such impact load to establish the requirements for protection of rail users and passers-by.

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EN 16727-3:2017 (E)

1 Scope

This European Standard specifies minimum requirements and other criteria for assessing the general safety and environmental performance of noise barriers and related devices acting on airborne sound propagation under typical rail-side 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 G.

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.

prEN 16727-1:2015, *Railway applications - Track - Noise barriers and related devices acting on airborne sound propagation - Non-acoustic performance - Part 1: Mechanical performance under static loadings - Calculation and test methods*

EN 50122-1, *Railway applications - Fixed installations - Electrical safety, earthing and the return circuit - Part 1: Protective provisions against electric shock*

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

3 Terms and definitions

(standards.iteh.ai)

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

3.1 noise barrier

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noise reducing device, which obstructs the direct transmission of airborne sound emanating from railways and which will typically span between posts and also may overhang the railway

Note 1 to entry: Noise barriers are generally made of acoustic and structural elements (see 3.3 and 3.4).

3.2 cladding

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

Note 1 to entry: Claddings are generally made of acoustic and structural elements (see 3.3 and 3.4).

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

Note 1 to entry: In some noise barriers, the acoustic function and the structural function cannot be clearly separated and attributed to different components.

3.5**added device**

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

3.6**rail side exposure**

use of the product as a noise barrier installed alongside railways

4 Symbols and abbreviations

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

Table 1 — Symbols and abbreviations

| Symbol or abbreviation | Designation | Unit |
|------------------------|--|---------|
| r | Radius of curvature in a vertical section of the impact surface of the impactor described in Annex B | mm |
| α | Aperture angle in a vertical section of the impactor described in Annex B | degrees |

5 Requirements**5.1 Reaction to brush fire (standards.iteh.ai)**

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

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

5.2 Secondary safety (shatter properties)

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

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

5.3 Environmental protection

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

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

5.4 Means of access or escape in emergency

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

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

5.5 Reflection of light

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

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

5.6 Electric ground connection of noise barriers on electrified lines

The provisions in Annex F shall be applied.

This European Standard permits specifying authorities to indicate that there is no requirement for electric ground connection.

5.7 Electrolytic corrosion

The provisions in Annex G shall be applied.

This European Standard permits specifying authorities to indicate that there is no requirement for electrolytic corrosion to be mitigated.

6 Test report

6.1 Information to be reported

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

- a) number and year of this European Standard;
- 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.

6.2 Summary report

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)

Reaction to brush fire

A.1 General

Noise barriers and related devices acting on airborne sound propagation can be exposed to fire arising from dry vegetation or other material in close proximity. 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 railway.

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 materials.

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

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 railway.

The acoustic elements shall be installed as in the intended use.

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 m² 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 localized sources of fire at their 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 m³.

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