

Railway applications - Track - Noise barriers and related devices acting on airborne sound propagation - Test method for determining the acoustic performance - Part 2: Intrinsic characteristics - Airborne sound insulation in the laboratory under diffuse sound field conditions

EESTI STANDARDI EESSÕNA

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English Version

**Railway applications - Track - Noise barriers and related devices
acting on airborne sound propagation - Test method for
determining the acoustic performance - Part 2: Intrinsic
characteristics - Airborne sound insulation in the laboratory
under diffuse sound field conditions**

Applications ferroviaires - Voie - Dispositifs de réduction du
bruit - Méthode d'essai pour la détermination des
performances acoustiques - Partie 2: Caractéristiques
intrinsèques - Isolation au bruit aérien en salle réverbérante
dans des conditions de champ acoustique diffus

Bahnanwendungen - Oberbau - Lärmschutzwände und
verwandte Vorrichtungen zur Beeinflussung der
Luftschallausbreitung - Prüfverfahren zur Bestimmung der
akustischen Eigenschaften - Teil 2: Produktspezifische
Merkmale - Luftschalldämmung (Labormethode) bei
diffusen Schallfeldern

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Foreword

This document (EN 16272-2:2012) 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of an identical text or by endorsement, at the latest by April 2013, and conflicting national standards shall be withdrawn at the latest by April 2013.

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.

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This European Standard is one of the series EN 16272 "Railway applications — Track — Noise barriers and related devices acting on airborne sound propagation — Test method for determining the acoustic performance" as listed below:

- *Part 1: Intrinsic characteristics — Sound absorption in the laboratory under diffuse sound field conditions*
- *Part 2: Intrinsic characteristics — Airborne sound insulation in the laboratory under diffuse sound field conditions*
- *Part 3-1: Normalised railway noise spectrum and single number ratings for diffuse field applications*
- *Part 3-2: Normalized railway noise spectrum and single number ratings for direct field applications*¹⁾
- *Part 4: Intrinsic characteristics — In situ values of sound diffraction under direct sound field conditions*¹⁾
- *Part 5: Intrinsic characteristics — In situ values of sound reflection under direct sound field conditions*²⁾
- *Part 6: Intrinsic characteristics — In situ values of airborne sound insulation under direct sound field conditions*¹⁾
- *Part 7: Extrinsic characteristics — In situ values of insertion loss*²⁾

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1) In preparation.

2) This document has been prepared as a CEN Technical Specification and is in preparation.

Introduction

Noise barriers installed along railways need to provide adequate sound insulation so that sound transmitted directly through the device is not significant compared to the sound diffracted over the top. This European Standard specifies a test method for assessing the airborne sound insulation performance of noise barriers and related devices acting on airborne sound propagation designed for particular railway applications in reverberant field (a measure of intrinsic performance). It is not concerned with determining sound insulation performance in situ, nor with determining the acoustic efficiency at receiver positions (insertion loss), which additionally depend on factors which are not related to the product itself, e.g. the dimensions of the barrier and quality of installation work and site factors such as site geometry, ground impedance, meteorological effects, etc. The test is designed to allow the intrinsic airborne sound insulation performance of the device under test to be measured. The resulting rating should aid the selection of the devices for particular railway applications in reverberant field.

The measurements results of this method for airborne sound insulation are comparable but not identical with the results of the prEN 16272-6 method, mainly because the present method assumes a diffuse sound field, while the prEN 16272-6 method uses a directional sound field. Research studies suggest that a very good correlation exists between data measured according to the method described in the present standard and data measured according to the method described in prEN 16272-6.

The test method described in this European Standard should not be used to determine completely the intrinsic characteristics of airborne sound insulation for noise reducing devices to be installed in non-reverberant conditions, e.g. alongside railways in open space.

This method may be used to qualify noise reducing devices for other applications, e.g. to be installed along roads or nearby industrial sites. In such cases, the single-number ratings should be calculated using an appropriate spectrum.

This European Standard should be read in conjunction with:

- EN 16272-3-1, *Railway applications — Track — Noise barriers and related devices acting on airborne sound propagation — Test method for determining the acoustic performance — Part 3-1: Normalised railway noise spectrum and single number ratings for diffuse field applications*;
- prEN 16272-6, *Railway applications — Track — Noise barriers and related devices acting on airborne sound propagation — Test method for determining the acoustic performance — Part 6: Intrinsic characteristics — In situ values of airborne sound insulation under direct sound field conditions*.

1 Scope

This European Standard specifies the laboratory method for measuring the airborne sound insulation of noise barriers. It covers the assessment of the intrinsic airborne sound insulation performance of noise barriers and related devices acting on airborne sound propagation designed for railways which can reasonably be assembled inside the testing facility described in EN ISO 10140 series.

All noise reducing devices different from noise barriers and related devices acting on airborne sound propagation, e.g. devices for attenuation of ground borne vibration and on board devices are out of the scope of this European Standard.

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.

ENV 13005, *Guide to the expression of uncertainty in measurement*

EN 16272-3-1, *Railway applications — Track — Noise barriers and related devices acting on airborne sound propagation — Test method for determining the acoustic performance — Part 3-1: Normalised railway noise spectrum and single number ratings for diffuse field applications*

EN ISO 10140 (all parts), *Acoustics — Laboratory measurement of sound insulation of building elements*

3 Terms and definitions

For the purpose of this document the following terms and definitions apply.

3.1

noise barrier

noise reducing device, which obstructs the direct transmission of airborne sound emanating from railways; it may either span or overhang the railway

Note 1 to entry: Noise barriers are generally made of acoustic and structural elements (see 3.2 and 3.3).

3.2

acoustic element

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

3.3

structural element

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

4 Symbols and abbreviations

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