



## BSI Standards Publication

# Railway applications — Track — Noise barriers and related devices acting on airborne sound propagation — Test method for determining the acoustic performance

Part 5: Intrinsic characteristics — In situ  
values of sound reflection under direct  
sound field conditions

**bsi.**

...making excellence a habit.<sup>TM</sup>

This is a preview. Click here to purchase the full publication.

**National foreword**

This Published Document is the UK implementation of CEN/TS 16272-5:2014.

The UK participation in its preparation was entrusted to Technical Committee RAE/2, Railway Applications - Track.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2014. Published by BSI Standards Limited 2014

ISBN 978 0 580 76214 7

ICS 93.100

**Compliance with a British Standard cannot confer immunity from legal obligations.**

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 May 2014.

**Amendments issued since publication**

Date	Text affected

---

**TECHNICAL SPECIFICATION**  
**SPÉCIFICATION TECHNIQUE**  
**TECHNISCHE SPEZIFIKATION**

**CEN/TS 16272-5**

April 2014

ICS 93.100

English Version

**Railway applications - Track - Noise barriers and related devices  
 acting on airborne sound propagation - Test method for  
 determining the acoustic performance - Part 5: Intrinsic  
 characteristics - In situ values of sound reflection under direct  
 sound field conditions**

Applications ferroviaires - Voie - Dispositifs de réduction du  
 bruit - Méthode d'essai pour la détermination des  
 performances acoustiques - Partie 5: Valeurs in situ de la  
 réflexion acoustique dans des conditions de champ  
 acoustique direct

Bahnanwendungen - Oberbau - Lärmschutzwände und  
 verwandte Vorrichtungen zur Beeinflussung der  
 Luftschallausbreitung - Prüfverfahren zur Bestimmung der  
 akustischen Eigenschaften - Teil 5: Produktspezifische  
 Merkmale - In-situ-Werte zur Schallreflexion in gerichteten  
 Schallfeldern

This Technical Specification (CEN/TS) was approved by CEN on 26 February 2013 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

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**

## Contents

<b>Foreword</b> .....	<b>4</b>
<b>Introduction</b> .....	<b>5</b>
<b>1 Scope</b> .....	<b>7</b>
<b>2 Normative references</b> .....	<b>7</b>
<b>3 Terms and definitions</b> .....	<b>7</b>
<b>4 Symbols and abbreviations</b> .....	<b>10</b>
<b>5 Sound reflection index measurements</b> .....	<b>11</b>
<b>5.1 General principle</b> .....	<b>11</b>
<b>5.2 Measured quantity</b> .....	<b>11</b>
<b>5.3 Test arrangement</b> .....	<b>12</b>
<b>5.4 Measuring equipment</b> .....	<b>16</b>
<b>5.4.1 Components of the measuring system</b> .....	<b>16</b>
<b>5.4.2 Sound source</b> .....	<b>17</b>
<b>5.4.3 Test signal</b> .....	<b>17</b>
<b>5.5 Data processing</b> .....	<b>18</b>
<b>5.5.1 Calibration</b> .....	<b>18</b>
<b>5.5.2 Sample rate</b> .....	<b>18</b>
<b>5.5.3 Background noise</b> .....	<b>18</b>
<b>5.5.4 Signal subtraction technique</b> .....	<b>18</b>
<b>5.5.5 Adrienne temporal window</b> .....	<b>19</b>
<b>5.5.6 Placement of the Adrienne temporal window</b> .....	<b>21</b>
<b>5.5.7 Low frequency limit and sample size</b> .....	<b>21</b>
<b>5.6 Positioning of the measuring equipment</b> .....	<b>22</b>
<b>5.6.1 Maximum sampled area</b> .....	<b>22</b>
<b>5.6.2 Selection of the measurement positions</b> .....	<b>23</b>
<b>5.6.3 Reflecting objects</b> .....	<b>27</b>
<b>5.6.4 Safety considerations</b> .....	<b>27</b>
<b>5.7 Sample surface and meteorological conditions</b> .....	<b>27</b>
<b>5.7.1 Condition of the sample surface</b> .....	<b>27</b>
<b>5.7.2 Wind</b> .....	<b>27</b>
<b>5.7.3 Air temperature</b> .....	<b>28</b>
<b>5.8 Measurement uncertainty</b> .....	<b>28</b>
<b>5.9 Measuring procedure</b> .....	<b>28</b>
<b>5.10 Test report</b> .....	<b>29</b>
<b>Annex A (informative) Measurement uncertainty</b> .....	<b>30</b>
<b>A.1 General</b> .....	<b>30</b>
<b>A.2 Expression for the calculation of sound reflection index</b> .....	<b>30</b>
<b>A.3 Contributions to measurement uncertainty</b> .....	<b>31</b>
<b>A.4 Expanded uncertainty of measurement</b> .....	<b>31</b>
<b>A.5 Measurement uncertainty based upon reproducibility data</b> .....	<b>32</b>
<b>Annex B (informative) Template of test report on sound reflection of railway noise barriers</b> .....	<b>33</b>
<b>B.1 Template of test report</b> .....	<b>33</b>
<b>B.2 Test setup (example)</b> .....	<b>34</b>

B.3	Test object and test situation (example) .....	35
B.4	Results (example) .....	37
B.4.1	Part 1 – Results in tabular form .....	37
B.4.2	Part 2 – Results in graphic form .....	38
	Bibliography .....	39