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Declaration of uncertainties in test reports

Déclaration des incertitudes dans les rapports d'essai

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91.120.20	Akustika v stavbah. Zvočna izolacija	Acoustics in building. Sound insulation

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TECHNICAL REPORT

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TECHNISCHER BERICHT

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English Version

Declaration of uncertainties in test reports

Déclaration des incertitudes dans les rapports d'essai

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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (CEN/TR 16961:2018) has been prepared by Technical Committee CEN/TC 126 “Acoustic properties of building elements and of buildings”, the secretariat of which is held by AFNOR.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

1 Scope

The purpose of this document is to indicate how to present the uncertainty data determined by EN ISO 12999-1 in a laboratory test report of the Sound reduction index R of a building product or a building system, determined in accordance with EN ISO 717-1 and EN ISO 10140-2:2010, Figure B.1. It is planned to include this information in EN ISO 10140-2.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 12999-1, *Acoustics — Determination and application of measurement uncertainties in building acoustics — Part 1: Sound insulation (ISO 12999-1)*

EN ISO 717-1, *Acoustics — Rating of sound insulation in buildings and of building elements — Part 1: Airborne sound insulation (ISO 717-1)*

EN ISO 10140-2:2010, *Acoustics — Laboratory measurement of sound insulation of building elements — Part 2: Measurement of airborne sound insulation (ISO 10140-2:2010)*

EN 16703, *Acoustics — Test code for drywall systems of plasterboard with steel studs — Airborne sound insulation*

EN 12758, *Glass in building — Glazing and airborne sound insulation — Product descriptions and determination of properties*

3 Airborne sound insulation

In conjunction with EN ISO 12999-1, σ_R [1] shall be used in the absence of uncertainty data for a specific class of specimen, e.g. from an inter-laboratory test or test codes such as EN 16703 and EN 12758.

σ_R is the average of standard deviations of many round robins, each of them dealing with a different class of specimen. So for some classes of specimen, σ value is higher than σ_R. It is asked to check if this could be the case by using available data for the class of specimen tested. If no data are available, a warning shall be set.

σ_R data are stated in Table 1.

Table 1 — Standard uncertainties for single-number values in accordance with EN IS0 12999-1 and with EN ISO 717-1

Descriptor	σ_R
R_w	1,2
R_w+ C	1,3
R_w+ C_{tr}	1,5
R_w+ $C_{100-5000}$	1,3
R_w+ $C_{50-3150}$	1,3
R_w+ $C_{50-5000}$	1,3
R_w+ $C_{tr,100-5000}$	1,5
R_w+ $C_{tr,50-3150}$	1,5
R_w+ $C_{tr,50-5000}$	1,5

In case of existence of uncertainty data for the tested specimen, these data shall be used.

For declaration in test reports of products or system data, two sided intervals shall be used. It is recommended to use k = 2.

NOTE k = 2, two sided intervals correspond to a confidence level close to 95 %.

EXAMPLE In the absence of uncertainty data for a product, the airborne sound insulation of this product will be designated as:

$R_w(C;C_{tr})$ = 33(-2; -5) dB;

R_w = (33,2 ± 2,4) dB (k = 2,two-sided);

R_w+C = (31,3 ± 2,6) dB (k = 2,two-sided);

R_w+C_{tr} = (28,3 ± 3,0) dB (k = 2,two-sided).

In the absence of uncertainty data for the class of specimen tested, the following statement should be added:

WARNING — Due to the absence of knowledge of the uncertainty data for the class of specimen tested, the confidence level may be lower.

Bibliography

[1] EN ISO 12999-1, *Acoustics — Determination and application of measurement uncertainties in building acoustics — Part 1: Sound insulation (ISO 12999-1)*

[2] WITTSTOCK E. Determination of Measurement Uncertainties in Building Acoustics by Interlaboratory Tests. Part 1: Airborne Sound Insulation. *Acta Acustica (Les Ulis)*. 2015, **101** pp. 88–98

[3] C. Scrosati, A. Pievatolo, M. Garai, The Uncertainty Declaration of Building Acoustics Measurements: How to select the Uncertainty of Reproducibility from Inter-laboratory Tests *Acta Acustica united with Acustica* 2018, **104**, pp. 295-303