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Tryckeri- och pappersmaskiner – Bullermättningsmetod för tryckeri-, massatillverknings- och papperskonverteringsmaskiner samt kringutrustning – Noggrannhetsklasser 2 och 3

Noise measurement methods for printing, paper converting, paper making machines and auxiliary equipment – Accuracy grades 2 and 3

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EUROPEAN STANDARD
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Noise measurement methods for printing, paper converting,
paper making machines and auxiliary equipment - Accuracy
grades 2 and 3

Méthodes de mesurage du bruit émis par les machines
d'impression, de transformation, de fabrication et de finition
du papier - Classes de précision 2 et 3

Geräuschmessverfahren für Druck- und
Papierverarbeitungs-, Papierherstellungs- und
Ausrüstungsmaschinen - Genauigkeitsklassen 2 und 3

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Foreword

This document (EN 13023:2003+A1:2010) has been prepared by Technical Committee CEN/TC 198 "Printing and paper machinery - Safety", 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of an identical text or by endorsement, at the latest by September 2010, and conflicting national standards shall be withdrawn at the latest by September 2010.

This document includes Amendment 1, approved by CEN on 2010-02-07.

This document supersedes EN 13023:2003.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 and A1.

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 has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

A1 For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. A1

Annexes A to J are normative.

This document contains a bibliography.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

1 Scope

This standard specifies all the information necessary to carry out efficiently and under standardized conditions the determination, declaration and verification of airborne noise emission from printing and paper converting machines covered by the EN 1010 series and from paper making and finishing machines covered by the EN 1034 series. It specifies noise measurement methods and installation and operating conditions to be used for the test.

This standard applies to those machines listed in the normative annexes A to J. The principles of this noise test code should be applied as far as possible also for the determination of noise emission of machines and machine parts not listed in the normative annexes A to J. In such cases, all information relating to assembly, installation and operating conditions as well as the arrangement of work stations should be recorded and reported in the test report.

Noise emission characteristics include emission sound pressure levels at work stations and the sound power level. Declared noise emission values permit comparison of printing and paper machines on the market.

The use of this noise test code ensures the reproducibility of the determination of the characteristic noise emissions within specific limits. These limits are determined by the accuracy grade of the noise measuring method used. Noise measurements specified by this standard are carried out by the engineering method (accuracy grade 2) and the survey method (accuracy grade 3).

2 Normative references

A1 The following referenced documents are indispensable for the application 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. **A1**

A1 *deleted text* **A1**

A1 EN ISO 216:2007, *Writing paper and certain classes of printed matter — Trimmed sizes — A and B series, and indication of machine direction (ISO 216:2007)* **A1**

A1 EN ISO 3740:2000, *Acoustics — Determination of sound power levels of noise sources — Guidelines for the use of basic standards (ISO 3740:2000)* **A1**

EN ISO 3744:1994, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering method in an essentially free field over a reflecting plane (ISO 3744:1994)*

EN ISO 3746:1995, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane for accuracy grade 3 (ISO 3746:1995)*

EN ISO 4871:1996, *Acoustics — Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)*

EN ISO 9614-1:1995, *Acoustics — Determination of sound-power levels of noise sources using sound intensity — Part 1: Measurement at discrete points (ISO 9614-1:1993)*

EN ISO 9614-2:1996, *Acoustics — Determination of sound-power levels of noise sources using sound intensity — Part 2: Measurement by scanning (ISO 9614-2:1996)*

EN ISO 11200:1995, *Acoustics — Noise emitted by machinery and equipment — Guidelines for the use of basic standards for the determination of emission sound pressure levels at a work station and at other specified positions (ISO 11200:1995)*

EN ISO 11202:1995, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Survey method for measurements accuracy grade 3 under operating conditions (ISO 11202:1995)*

EN ISO 11203:1995, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions from the sound-power level (ISO 11203:1995)*

EN ISO 11204:1995, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Method requiring environmental corrections (ISO 11204:1995)*

3 Terms and definitions

For the purposes of this **Error! Reference source not found.**, the following term and definition applies in addition to the definitions given in the basic standards for the determination of emission sound pressure levels at work stations and other specified positions (EN ISO 11200:1995, EN ISO 11202:1995, EN ISO 11203:1995 and EN ISO 11204:1995) and in the basic standards for the determination of sound power levels (EN ISO 3740:2000, EN ISO 3744:1995, EN ISO 3746:1995 and EN ISO 9614-1:1995 and ISO 9614-2:1996).

3.1

large machines

large machines within the meaning of this standard are machines where the greatest linear dimension exceeds 15 m

4 Description of machines

The machines described in this standard include the equipment or parts covered by the normative annexes A to J or as described in the measurement reports, which contribute significantly to noise emission.

For machines not listed in the normative annexes A to J, a description of auxiliary devices shall be provided where these devices are required for the correct operation of the machines and are therefore subject to the noise measurement methods.

5 Emission sound pressure level determination

The measuring points for determining the emission sound pressure level at work stations and other specified positions are defined in the normative annexes A to J. All microphone positions are at a height of 1,6 m above the floor or access level.

Emission sound pressure levels shall be determined in accordance with EN ISO 11204 (with accuracy grade 2). Where this standard is not applicable, EN ISO 11204 (with accuracy grade 3) or EN ISO 11202:1995 shall be applied. The test report shall state the reasons why it was not possible to apply a grade 2 method.

Where measuring is made difficult due to strong environmental influences such as sound reflections from walls and high levels of noise from other sources, EN ISO 11203 (with accuracy grades 2 or 3) may be applied if the sound power level has been determined in accordance with EN ISO 9614-1 or EN ISO 9614-2.

Where emission sound pressure levels are determined in frequency bands, EN ISO 11204 shall be applied. The work station should preferably be used as the measuring point or, if this cannot be defined, the point with the highest sound pressure level measured at a distance of 1 m from the machine surface and at a height of 1,6 m above the floor or access level. L_{pC} The C-weighted peak emission sound pressure level (L_{pCpeak}) shall be determined where this exceeds 63 Pa (130 dB in relation to 20 μ Pa). L_{pC}

6 Sound power level determination

6.1 General method

A1 If at any workstation the A-weighted emission sound pressure level exceeds 80 dB(A) the sound power level has to be determined additionally. This shall be done in accordance with EN ISO 3744, EN ISO 9614-1 (with accuracy grade 2) or EN ISO 9614-2 (with accuracy grade 2). **A1** Where these standards are not applicable, EN ISO 3746, EN ISO 9614-1 (with accuracy grade 3) or EN ISO 9614-2 (with accuracy grade 3) shall be used. The test report shall state the reasons why it was not possible to apply a grade 2 method for determining the sound power level.

6.2 Alternative method for large machines

For large machines, instead of the sound power level, it is permissible to determine and declare emission sound pressure levels at specified measurement points around the machine.

Such measuring points are specified along a path around the machine at a height of 1,6 m above the floor or access level and at a distance of 1 m from the machine. They shall be spaced so that the difference in emission sound pressure levels between adjacent points does not exceed 5 dB(A).

NOTE Where the emission sound pressure levels around the machine vary by less than 5 dB e.g. when the sound radiation is very uniform, measurements should be made at 4 characteristic positions at least.

For determining the emission sound pressure level, the method described in clause 5 shall be used.

7 Assembly and installation conditions

The machine shall be assembled and installed in accordance with the manufacturer's instructions. If the conditions of installation are not known or if several modes of installation are possible, the type of installation used for noise measurement shall be specified in the test report.

The assembly and installation conditions of the machine shall be identical for determining both sound power levels and also emission sound pressure levels at the measuring points specified in the normative annexes A to J.

Care shall be taken that any electrical connections, piping or air ducts connected to the machine do not significantly increase noise emission.

8 Operating conditions

Operating conditions with significant noise emission are stipulated in the normative annexes A to J. Operating conditions shall be identical for determining both the emission sound pressure level at the specified measuring points and also the sound power level. Where there are no operating conditions defined in the normative annexes A to J, it is understood that operating conditions with significance for noise emission do not exist. If the operating conditions specified in the annexes cannot be adhered to partly or completely, the operating conditions that differ shall be recorded and documented in the test report.

There are basically two different types of operating conditions:

- a) Where the normal running of the machine leads to a constant noise emission, this operating condition shall be used for noise measurements.
- b) For variable operating conditions, either one or more typical operating conditions or one characteristic work cycle comprising, amongst other things, the time required for converting and finishing the product (printed sheet, folded box, book block etc.) shall be defined.