Masinate ohutus. Õhu kaudu levivate ohtlike ainete emissiooni hindamine. Osa 1: Katsemeetodite valimine

Safety of machinery - Evaluation of the emission of airborne hazardous substances - Part 1: Selection of test thods

EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN 1093-1:1999 sisaldab Euroopa standardi EN 1093-1:1998 ingliskeelset teksti. Käesolev dokument on jõustatud 23.11.1999 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 1093-1:1999 consists of the English text of the European standard EN 1093-1:1998. This document is endorsed on 23.11.1999 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: Käesolev Euroopa standard määrab kindlaks parameetrid, mida saab kasutada seadmetest väljuvate saasteainete emissiooni või seadmetesse sisseehitatud saastekontrollsüsteemide tõhususe hindamiseks; annab juhiseid sobivate testimismeetodite valimiseks vastavalt nende erinevatele kasutusvaldkondadele ja seadmete tüüpidele, kaasa arvatud abinõude rakendamine saasteainete toime vähendamiseks. Testimismeetodid on antud seda standardit täiendavates osades (vt. tabelit 1 ja lisa A).	**Scope:**

ICS 13.040.40

Võtmesõnad: emissioon, hinnang, laboratoorsed testid, ohtlikud ained, saastumine, seadmete ohutus, testid, valik, välikatsetused, õhu saastumine

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English version

Safety of machinery

Evaluation of the emission of airborne hazardous substances

Part 1: Selection of test methods

Sécurité des machines – Evaluation de l'émission de substances dangereuses véhiculées par l'air – Partie 1: Choix des méthodes d'essai

Sicherheit von Maschinen – Bewertung der Emission von luftgetragenen Gefahrstoffen – Teil 1: Auswahl der Prüfverfahren

This European Standard was approved by CEN on 1998-09-04.

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The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Contents

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 114 "Safety of machinery", 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 March 1999, and conflicting national standards shall be withdrawn at the latest by March 1999.

This European Standard 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).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this standard.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

0 Introduction

This European Standard is a type B standard as stated in ENV 1070 : 1993.

The concentration level of substances resulting from emission of airborne hazardous substances from machines depends upon factors including:

– the emission rate of airborne hazardous substances (in this European Standard called: pollutant) from the machine under examination, depending on the type of process and the production rate of the machine;

– the performance of the pollution control system associated with the machine and, in the case of air recirculation, the performance of the separation system;

– the surrounding conditions, especially the air flow pattern, which may reduce the pollution (efficient general ventilation) or increase it (disturbing air, crossdraughts);

– the worker's location in relation to the machine and its pollution control system, and taking into account the workers movements;

– the quality of maintenance; poor quality has generally an adverse effect on the performance of the pollution control and the separation systems.

This European Standard concerns the first two points in this list and forms only part of a comprehensive risk assessment. It is not for a risk assessment of the work place. Evaluating the parameters defined in this European Standard leads to an evaluation of the performance of the machine and its associated pollution control system.

This European Standard can be used as a part of verification described in EN 626-2.

1 Scope

This European Standard

– specifies parameters which may be used for the assessment of the emission of pollutants from machines or the performance of the pollution control systems integrated in machines;

– gives guidance on the selection of appropriate test methods according to their various fields of application and types of machines including the effects of measures to reduce exposures to pollutants. The test methods are given in additional parts of this standard (see table 1 and annex A).

Other test methods for parameters may be included at a later stage (e. g. fume boxes).

This European Standard is not applicable for certain types of off-the-road vehicles powered by internal combustion engines which are subject to the Machinery Directive.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 292-1 : 1991	Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology
EN 292-2 : 1991	Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles and specifications
EN 292-2/A1 : 1995	Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles and specifications; Amendment A1
EN 626-2	Safety of machinery - Reduction of risks to health from hazardous substances emitted by machinery - Part 2: Methodology leading to verification procedures.
ENV 1070 : 1993	Safety of machinery - Terminology
EN 1093-3	Safety of machinery - Evaluation of the emission of airborne hazardous substances - Part 3: Emission rate of a real specified pollutant - Bench test method using the real pollutant

EN 1093-4	Safety of machinery - Evaluation of the emission of airborne hazardous substances - Part 4: Capture efficiency of an exhaust ventilation system - Tracer method
EN 1093-6	Safety of machinery - Evaluation of the emission of airborne hazardous substances - Part 6: Separation efficiency by mass, unducted outlet
EN 1093-7	Safety of machinery - Evaluation of the emission of airborne hazardous substances - Part 7: Separation efficiency by mass, ducted outlet
EN 1093-8	Safety of machinery - Evaluation of the emission of airborne hazardous substances - Part 8: Pollutant concentration parameter, test bench method
EN 1093-9	Safety of machinery - Evaluation of the emission of airborne hazardous substances - Part 9: Pollutant concentration parameter, room method
prEN 1093-11	Safety of machinery - Evaluation of the emission of airborne hazardous substances - Part 11: Decontamination index

3 Definition of assessment parameters

3.1 General

When particle size distribution is determined at the same time as pollutant concentration, an assessment parameter for each size fraction may be defined.

3.2 Emission rate of a specified pollutant

3.2.1 uncontrolled emission rate of a specified pollutant ($\dot{m}_u$): The mass of pollutant emitted from the machine into the space around the machine per unit of time. Any measures to reduce the air pollution around the machine (e. g. capture devices, containment equipment, wetting process) are not in use or activated.

3.2.2 controlled emission rate of a specified pollutant ($\dot{m}_k$): The mass of pollutant emitted from the machine into the space around the machine per unit of time, taking into account the effects of measures to reduce the air pollution.

3.3 capture efficiency (η_c): The capture efficiency of a pollution control system (η_c) is defined as the ratio of the mass-flowrate of a specified pollutant directly collected by the pollutant control system to the uncontrolled mass-flowrate of this pollutant emitted from the machine.

The capture efficiency, in terms of a percentage, is expressed at follows:

$$\eta_c = \frac{\dot{m}_u - \dot{m}_k}{\dot{m}_u} \cdot 100 \qquad \ldots (1)$$

NOTE: This equation is applicable only if $\dot{m}_u - \dot{m}_k$ represents the pollutant mass-flowrate directly captured. This parameter is not usable when the amount of emission is effected by the control system.

Where the pollution control system is an exhaust ventilation system and provided comparable discharge and flow patterns of the real pollutant can be simulated by a tracer technique the equation becomes:

$$\eta_c = \frac{q_k}{q_u} \cdot 100 \qquad \ldots (2)$$

where:

q_u is the uncontrolled mass-flowrate of tracer material generated;

q_k is the mass-flowrate of tracer material directly collected by the exhaust ventilation system.

3.4 separation efficiency by mass (η_s): The separation efficiency of an air cleaning system for a specified pollutant, is the ratio of the mass[1]) of pollutant retained by the air cleaning system (m_3) to the mass[1]) of pollutant entering the air cleaning system (m_1) during a given period.

[1]) For special applications to measure the number of fibres or particles instead of the mass.