Irish Standard
I.S. EN 16589-1:2022

Version 1.00

Laboratory local exhaust devices - Part 1: General requirements and type test methods for articulated extraction arms

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I.S. EN 16589-1:2022 V1.00 was published under the authority of the NSAI and came into effect on: 2022-12-22

ICS number(s): 71.040.10

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National Foreword

I.S. EN 16589-1:2022 V1.00 is the version of the NSAI adopted European document EN 16589-1:2022, *Laboratory local exhaust devices - Part 1: General requirements and type test methods for articulated extraction arms,* including any Corrections, Amendments etc. to EN 16589-1:2022.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 16589-1

December 2022

ICS 71.040.10

Supersedes CEN/TR 16589:2013

English Version

Laboratory local exhaust devices - Part 1: General requirements and type test methods for articulated extraction arms

Dispositifs d'aspiration locale de laboratoire - Partie 1 : Exigences générales et méthodes d'essais de type pour les bras d'extraction articulés

Lokale Absaugeinrichtungen im Labor - Teil 1: Absaugarme mit Gelenken

This European Standard was approved by CEN on 21 November 2022.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Ref. No. EN 16589-1:2022 E

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European foreword

This document (EN 16589-1:2022) has been prepared by Technical Committee CEN/TC 332 “Laboratory equipment”, 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of an identical text or by endorsement, at the latest by June 2023, and conflicting national standards shall be withdrawn at the latest by June 2023.

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.

This document supersedes CEN/TR 16589:2013.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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Introduction

Articulated extraction arms are local exhaust devices consisting of capture devices that may be constructed in a variety of geometric shapes (hoods, nozzles, flat screens etc.) which are connected to or mounted on extraction arms or arms with flexible joints. They are used for a variety of different applications in the laboratory where contaminants are encountered. The design of articulated extract arms for laboratories may differ for different applications.

The ability of articulated extract arms to effectively capture contaminants is subject to a number of factors. These factors include extract volume flow, capture velocity, capture hood design, manoeuvrability, position in relation to emission source, user activity, and room conditions.

Due to the fact that the capture efficiency can be affected dramatically by a change in any of the above conditions, articulated extract arms are only useful for very small pollution sources, or when the pollution source cannot be reasonably enclosed and has distinct points where the pollution might occur.

The objective of this document is to give information relevant to articulated extraction arms and to specify type test methods for articulated extraction arms. This document offers assistance in the testing of articulated extraction arms and in the drafting of user information. It is intended to contribute towards mutual understanding amongst manufacturers, laboratory designers, users and health and safety authorities.

The performance data obtained onsite will not necessarily reflect the type test data due to environmental influences. Prior to use, the performance of the device needs to be assessed to ensure it complies with the performance benchmarks specified in the risk assessment. It is the responsibility of the user that appropriate commissioning has been carried out. The extent of the commissioning testing should be based on a risk assessment.

It is intended to work on further parts of this standard series dealing with commissioning and installation and on-site testing.

1 Scope

This document is applicable to articulated extraction arms used as a local exhaust device in laboratories and comprised of a specific capture device (receiving, enclosing or capture hood, nozzle or flat screen) connected to ducting to move air from the capture device to discharge.

This document is a product standard. This document covers product performance type test methods. Occupational health and safety assessments methods are not included in this document.

This document specifies:

- a method to assess the three-dimensional capture zone of an articulated extract arms;
- a method for assessing the isothermal and diffusive emission release capture efficiency of articulated extract arms and robustness to a challenge of air disturbance directly in front of and in close proximity to the capture hood and release source positioned on a table;
- a method for establishing the reachable, three-dimensional workspace of articulated extract arms;
- a method for measuring the pressure drop and noise level of articulated extract arms;
- instructions for marking the devices and recommended information in the product manual;
- guidance for use describing the limitations of articulated extract arms for different airflow rates;
- guidance on selection, installation, commissioning, and testing of articulated extract arms and the associated local exhaust ventilation systems.

The test procedure for capture efficiency and the guidance included in Annex A and B does not apply to particle sources or point sources which release contaminants with initial velocity of above 0,5 m/s due to temperature, pressure release, work process or similar.

The scope does not include filtration requirements and impact of fully or partly recirculated airflow extracted by an articulated extract arm.

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 1093-4, *Safety of machinery — Evaluation of the emission of airborne hazardous substances — Part 4: Capture efficiency of an exhaust system — Tracer method*

EN ISO 5167-1:2003, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full — Part 1: General principles and requirements*

EN ISO 11204, *Acoustics - Noise emitted by machinery and equipment - Determination of emission sound pressure levels at a work station and at other specified positions applying accurate environmental corrections (ISO 11204:2010)*