



BSI Standards Publication

Indoor air

Part 44: Test method for measuring perceived indoor air quality
for use in testing the performance of gas phase air cleaners

National foreword

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The UK participation in its preparation was entrusted to Technical Committee EH/2/5, Emissions to internal environments.

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Published by BSI Standards Limited 2023

ISBN 978 0 539 16702 3

ICS 13.040.20

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 December 2023.

Amendments/corrigenda issued since publication

Date	Text affected
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INTERNATIONAL STANDARD

ISO
16000-44

First edition
2023-12-13

Indoor air —

Part 44:

Test method for measuring perceived indoor air quality for use in testing the performance of gas phase air cleaners

Air intérieur —

*Partie 44: Méthode d'essai pour mesurer la qualité de l'air intérieur
perçue à utiliser pour tester les performances des épurateurs d'air en
phase gazeuse*



Reference number
ISO 16000-44:2023(E)

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Foreword

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This document was prepared by Technical Committee ISO/TC 146, *Air quality*, Subcommittee SC 6, *Indoor air*.

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Introduction

There is an increased interest in the development of air cleaners removing gaseous pollutants. Such air cleaners are also called air purifiers. They have been marketed for reducing concentrations of gaseous pollutants using different removal principles including among others physical and physicochemical sorption or oxidation (mineralization).

The performance of gas phase air cleaners can be evaluated by their removal efficiency defined by the ratio of concentration of pollutants downstream and upstream an air cleaner in the case of single pass efficiency. Removal efficiency can also be obtained by determining the change of concentration in a room where an air cleaner is in operation. Removal efficiency is consequently used to calculate clean air delivery rate i.e. the equivalent airflow delivered by an air cleaner that does not contain pollutants that were removed by an air cleaner (unpolluted air).

The removal efficiency is usually determined using a single pollutant or a mixture of up to a few pollutants thus not capturing the entire spectrum of pollutants present. For this purpose, sensory assessment of air quality made by human subjects can be made. The ratings of air quality as perceived by people are not normally used (seldom) to assess the removal efficiency of air cleaners although, based on them, ventilation requirements prescribed by standards in many parts of the world have been determined. Because measurements of chemical compounds will seldom capture all pollutants and because no models exist to describe how they will be perceived by building occupants, examining the effect of the air quality of an air cleaner as perceived by humans [so-called perceived air quality (PAQ)] seems relevant and should be considered as a supplementary method to chemical measurements.

There are different methods used to determine PAQ. The two most frequently used are the assessments of odour intensity of the air and acceptability of air quality; the latter can be used to determine the percentage of dissatisfied people. The measurements are made by human subjects (sensory panels) who use their olfactory sense to determine PAQ. Specially trained subjects (so-called trained panels) and untrained subjects (so-called untrained panels) can be used.

Historically, when ventilation requirements were determined in the 1930s by Yaglou and his colleagues, odour intensity was used to determine PAQ based on which ventilation requirements were prescribed. Yaglou's results were subsequently used in standards and handbooks in many parts of the world have been fundamentally based on his work. In the later research in the 1980s among others by Fanger and his colleagues, the ratings of acceptability were used to describe PAQ and ventilation requirements prescribed in the standards were subsequently revised.

Considering the above, there is a need for a standard to assess the performance of gas phase air cleaners based on sensory ratings of air quality so that it can be compatible with the current ventilation standards. This document describes a test method that can be used to evaluate the performance of air cleaners that primarily remove gaseous pollutants from the air based on the ratings of PAQ.

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