



**International
Standard**

ISO 24953

**Textiles — Determination of iodine
isotope adsorption efficiency of
activated carbon fibre**

*Textiles — Détermination de l'efficacité d'adsorption des isotopes
d'iode par la fibre de carbone activé*

**First edition
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Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	1
5 Apparatus	2
6 Reagents and materials	5
7 Preparation of test specimens	6
8 Test procedure	6
8.1 Test condition	6
8.2 Canister preparation	7
8.2.1 General	7
8.2.2 Procedure for canister preparation	7
8.3 Procedure for leakage test	7
8.3.1 General	7
8.4 Stabilization period	8
8.5 Pre-equilibrium period	8
8.6 Equilibrium period	8
8.7 Adsorption period	8
8.8 I^{131} radiation injected during one test	9
8.9 Desorption period	9
8.10 Collection of activated carbon fibre and charcoal	9
8.11 Measurement	9
9 Calculation	9
9.1 Penetration rate	9
9.2 Adsorption efficiency of test bed (E) and back-up bed (E_{b1})	10
9.3 I^{131} adsorption capacity of activated carbon fibre	10
9.4 Standard deviation of penetration	10
9.5 Counting conditions	11
9.6 Gamma count correction	11
10 Test report	11
Annex A (normative) Test system	12
Annex B (informative) Test procedure and test results	16
Bibliography	19

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 38, *Textiles*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Activated carbon fibre with a large specific surface area has excellent adsorption efficiency of iodine isotope (I^{131}). Therefore, standards for suitable adsorption efficiency test methods reflecting the geometric shape and physical and chemical properties of activated carbon fibres are needed. The development of reliable test methods that can objectively compare activated carbon fibres with non-fibrous activated carbon adsorption efficiency will help boost the activated carbon fibre market for producers and consumers.

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Textiles — Determination of iodine isotope adsorption efficiency of activated carbon fibre

1 Scope

This document specifies a method of testing the adsorption efficiency of activated carbon fibres, such as nonwoven fabric or fibrous felt with a thickness of less than 20 mm for adsorption and removal of iodine isotopes (I^{131}), included in air or gas flow (exhaust).

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.

ASTM D3803-91, *Standard Test Method for Nuclear-Grade Activated Carbon*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1 packing density

ρ_p
weight of an activated carbon fibre specimens packed in the Labyrinth typed canister, calculated as

$$\rho_p = \frac{W_m}{V_c} \quad (1)$$

where

- | | |
|----------|--|
| ρ_p | is the packing density (g/cm ³); |
| W_m | is the weight conversion value obtained by multiplying the mass of activated carbon fibre specimens charged in a canister or guide with the same packing density and geometric shape as measured by an electronic scale by gravitational acceleration (g); |
| V_c | is the volume of the specimen filling part of the canister (cm ³). |

Note 1 to entry: The definition and measurement of the packing density of activated carbon fibre specimens packed in labyrinth type canisters with a depth of (20 ± 0.2) mm and a bed diameter (50 ± 0.1) mm are obtained. In calculating the packing density, the space between individual activated carbon fibre specimens packed in the canister or between the specimen and the canister wall is completely compacted without any gaps using a pressurizer in this document's test method.

4 Principle

The test specimens are stacked into the test canister and installed in the test facility along with back-up layer canisters, which function as filters to capture as much methyl iodide isotope as possible. And a high-