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**Bamboo charcoal —**  
**Part 3:**  
**Purification applications**

*Charbon de bambou —*  
*Partie 3: Applications pour purification*

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## 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 documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. [www.iso.org/directives](http://www.iso.org/directives)

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received. [www.iso.org/patents](http://www.iso.org/patents)

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

This document is prepared by Technical Committee ISO/TC 296, *Bamboo and Rattan*.

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](http://www.iso.org/members.html).

## Introduction

Bamboo charcoal (BC) is an eco-friendly biomass product with porous structure, which is generally used to absorb toxic indoor gases, such as formaldehyde and various volatile organic compounds (VOCs). Bamboo charcoal has good adsorption quality and abundant sources of raw materials. Bamboo charcoal for purification applications also comes with a great market potential both in industrial and domestic applications.

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# Bamboo charcoal —

## Part 3: Purification applications

### 1 Scope

This document specifies the requirements and test methods of bamboo charcoal for air-purification applications.

### 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.

ISO 16000-3, *Indoor air — Part 3: Determination of formaldehyde and other carbonyl compounds in indoor air and test chamber air — Active sampling method*

ISO 16000-6, *Indoor air — Part 6: Determination of volatile organic compounds in indoor and test chamber air by active sampling on Tenax TA sorbent, thermal desorption and gas chromatography using MS or MS-FID*

ISO 18122, *Solid biofuels — Determination of ash content*

ISO 18123, *Solid biofuels — Determination of the content of volatile matter*

ISO 18134-3, *Solid biofuels — Determination of moisture content — Oven dry method — Part 3: Moisture in general analysis sample*

ISO 18135, *Solid biofuels — Sampling*

### 3 Terms and definitions

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

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

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

#### 3.1

##### **bamboo charcoal for air purification**

##### **BCAP**

bamboo charcoal used to remove unwanted constituents in the air

#### 3.2

##### **bamboo charcoal**

##### **BC**

black solid porous product made of carbonized bamboo

**3.3**  
**moisture content**  
**MC**

water in the fuel removable under specific conditions

**3.4**  
**ash content**  
**AC**

mass of inorganic residue remaining after combustion of *bamboo charcoal* (3.2) under specified conditions, typically expressed as a percentage of the mass of dry matter in fuel

**3.5**  
**fixed carbon**  
**FC**

remaining carbon after removal of water, ash and volatile matter

**3.6**  
**adsorption**

phenomenon whereby atoms, ions, or molecules from a gas, liquid or dissolved solid adheres to a surface whereby the process creates a film of the adsorbate on the surface of the adsorbent

**4 Requirements**

**4.1 Sensory inspection**

The product shall appear black with no peculiar smell, contaminant and foreign matter.

**4.2 Requirements for air purification applications of bamboo charcoal**

**Table 1 — Requirements for physical and chemical properties of bamboo charcoal for air purification**

Item	Requirements		
	I	II	III
<b>Grading</b>			
<b>MC</b> %	≤9,00	≤12,00	≤12,00
<b>AC</b> %	≤4,50	≤6,50	≤8,50
<b>FC</b> %	≥85,00	≥ 75,00	≥ 65,00
<b>FAC</b> mg/g	≥80,00	≥60,00	≥40,00
<b>TVOC(ac)</b> mg/g	≥100,00	≥80,00	≥60,00

**Key**

MC = Moisture content

AC = Ash content

FC = Fixed carbon

FAC = Formaldehyde adsorption capacity

TVOC(ac) = Total volatile organic compounds adsorption capacity

NOTE This table illustrates the requirement of bamboo charcoal for air purification.

## 5 Sampling

Sampling of bamboo charcoal shall be conducted in accordance with ISO 18135. The sample for analysis shall be randomly chosen from a lot of bulk products with a minimum weight of no less than 1,0 kg.

## 6 Analytical methods

### 6.1 Visual inspection procedure

Put over 0,1 kg of bamboo charcoal on a piece of white paper, and then observe and decide the sample by sense of sight.

### 6.2 Determination of moisture content

Moisture content shall be determined according to ISO 18134-3.

### 6.3 Determination of ash content

Ash content shall be determined according to ISO 18122.

### 6.4 Determination of fixed carbon

Fixed carbon is the remaining carbon after removal of moisture, ash, and volatile matter from the dry bamboo charcoal or briquette, expressed in percentages.

Fixed carbon shall be calculated in compliance with [Formula \(1\)](#):

$$C = 100 \% - (A+V) \quad (1)$$

where

$C$  is fixed carbon expressed in percentages;

$A$  is ash content expressed in percentages;

$V$  is volatile matter expressed in percentages.

The volatile matter shall be determined in accordance with ISO 18123. All results shall be calculated to two decimal places and the mean value shall be rounded to the nearest 0,01 % for reporting.

### 6.5 Determination of formaldehyde adsorption capacity

Formaldehyde adsorption capacity shall be determined according to ISO 16000-3.

### 6.6 Determination of TVOC adsorption capacity

Total volatile organic compounds (TVOC) adsorption capacity shall be determined according to ISO 16000-6.

## 7 Marking and labelling

7.1 The following information shall appear on the face of the containers:

- a) name and address of the manufacturer;
- b) executive standard;