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Bamboo charcoal —

Part 3: Purification applications

Charbon de bambou —

Partie 3: Applications pour purification

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Foreword

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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.

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.

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

$$C = 100\ \% - (A+V) \tag{1}$$

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;