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First edition

Bamboo charcoal —

Part 2: Fuel applications

Charbon de bambou —

Partie 2: Applications pour carburant

PROOF/ÉPREUVE

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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

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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.

Introduction

Bamboo charcoal, which is a kind of fuel charcoal with a broad market prospect, is an excellent fuel for industrial and domestic use. Bamboo charcoal has a potential to be cleaner and more environment friendly than coal because of its extremely low content of sulphur and nitrogen. Using bamboo charcoal as the substitute of traditional charcoal is a feasible way to protect timber resources. The reliability of quality regulation becomes the key to the development of growing bamboo charcoal industry. Therefore, the International Standard of bamboo charcoal is necessary for the development of International Trade and quality requirements of bamboo charcoal products worldwide.

Bamboo charcoal —

Part 2:
Fuel applications

1 Scope

This document specifies the requirements and test methods of the raw and moulded bamboo charcoal for fuel 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 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*

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:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1
bamboo charcoal for fuel
BCFF
bamboo charcoal used to provide calories from combustion

3.2
calorific value
CV
energy amount per unit mass released on complete combustion

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 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
bamboo charcoal
BC
black solid porous product made of carbonized bamboo

3.7
bamboo charcoal briquette
BCB
shaped, solid product of carbonized bamboo particles or charcoal made by compression or extrusion with or without a binder

4 Requirements

4.1 Sensory inspection

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

4.2 Adhesives

The adhesives applied in the process shall be non-toxic and odourless.

Note The manufacturer can declare the non-toxicity of the adhesives used in the production of bamboo charcoal.

4.3 Requirements for fuel applications of bamboo charcoal

Table 1 — Requirements for physical and chemical properties of bamboo charcoal for fuel applications

Item	Requirements					
	BC			BCB		
Grading[a]	I	II	III	I	II	III
MC %	≤9,00	≤12,00	≤12,00	≤9,00	≤12,00	≤12,00
AC %	≤4,50	≤6,50	≤8,50	≤4,50	≤7,50	≤10,50

Key

BC = Bamboo Charcoal

BCB = Bamboo Charcoal Briquette

MC = Moisture content

AC = Ash content

FC = Fixed carbon

CV = calorific value

NOTE This table illustrates the requirement of bamboo charcoal for fuel application.

[a] Grading is referred to all indexes of bamboo charcoal granules, or briquettes. If one index value does not meet the requirement, de-grading or re-processing shall be conducted to re-evaluate, or agreement of conditional acceptance can be reached between supplier and purchaser.

[b] Calorific values are based on dry matter.

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Table 1 *(continued)*

Item	Requirements					
	BC			BCB		
FC %	≥85,00	≥75,00	≥65,00	≥85,00	≥75,00	≥65,00
CV[b] MJ/Kg	≥29,00	≥27,00	≥17,00	≥29,00	≥27,00	≥22,00

Key

BC = Bamboo Charcoal

BCB = Bamboo Charcoal Briquette

MC = Moisture content

AC = Ash content

FC = Fixed carbon

CV = calorific value

NOTE This table illustrates the requirement of bamboo charcoal for fuel application.

[a] Grading is referred to all indexes of bamboo charcoal granules, or briquettes. If one index value does not meet the requirement, de-grading or re-processing shall be conducted to re-evaluate, or agreement of conditional acceptance can be reached between supplier and purchaser.

[b] Calorific values are based on dry matter.

5 Sampling

Sampling of bamboo charcoal shall be 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 0.1 kg of bamboo charcoal on a white piece of paper, and then observe and decide the sample by sense of sight.

6.2 Determination of moisture content

Moisture content shall be determined in accordance with ISO 18134-3.

6.3 Determination of ash content

Ash content shall be determined in accordance with ISO 18122.

6.4 Determination of fixed carbon

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.