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**INDUSTRY STANDARD OF THE
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**Methods for the determination of broken-resistance and
proximate analysis of solidified biofuels**

生物质成型燃料抗碎性测试方法及工业分析方法

(English Translation)

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part 1: Structure and Drafting Rules of Standardization Documents" Drafting.

This document was proposed by the Forestry Energy Management Sub-Technical Committee of the National Energy Foundation and Management Standardization Technical Committee (SAC/TC20/SC7) and focus on it.

Drafting organizations of this document. Heilongjiang Institute of Forest Engineering and Environment, Nanjing Forestry University.

1 Scope

This document defines the terms and definitions of biomass briquette fuel shatter resistance test methods and industrial analysis methods, and stipulates that biomass briquette fuels the method of measuring the crushing resistance, moisture, ash and volatile content of the material and the calculation method of fixed carbon.

This document is applicable to solid fuels made from biomass materials such as wood, bamboo, straw, and nut shells.

2 Normative references

The content of the following documents constitutes an indispensable clause of the cost document through normative references in the text. Among them, dated quotations Only the version on that date is applicable to this document. For undated references, the latest version (including all amendments) is applicable to this file.

GB/T 211 Method for determination of total moisture in coal GB/T 212 Coal Industrial Analysis Method GB/T 21923 General Rules for the Inspection of Solid Biomass Fuels GB/T 28731 Industrial analysis method for solid biomass fuel GB/T 30366 Biomass terminology GB/T 35820 Forestry biomass raw material analysis method and sampling method LY/T 2384 wood pellet fuel NY/T 1880 Biomass solid briquette fuel sample preparation method ISO 3310-1 Wire Mesh Test Sieve

3 Terms and definitions

The following terms and definitions defined in GB/T 30366 apply to this document.

Solidified biofuels

Solid fuel produced directly or indirectly from biomass.

Proximate analysis

The general term for four biomass briquette analysis projects. moisture, ash, volatile and fixed carbon.

General analysis test sample A biomass fuel sample with a particle size of less than 1 mm in an air-dried state.

Ash

The residue obtained after a sample is burned under specified conditions.

Volatile matter

The sample is heated under the specified conditions and is insulated from air, and the mass loss after moisture correction is carried out.

Fixed carbon

Subtract the residue of ash from the residue of the sample after measuring the volatile matter.

Broken resistance

Biomass briquettes have the ability to resist wear during loading, unloading, transportation and transportation, and to maintain individual integrity.

4.1 Method summary

Weigh a certain quality of biomass fuel sample, put it into the test box, and make the test box rotate around the fixed shaft at a certain speed to make A certain degree of collision occurs between the test samples and between the sample and the vessel wall. Then separate the worn out fine particles, according to the remaining Calculate the shatter resistance of the sample mass.

4.2.1 Testing machine

The testing machine consists of a test box with a rotating shaft and a rotating device. (see picture 1) the test box has a rectangular parallelepiped structure and is made of hard materials (steel, aluminum or plexiglass). Length 300mm, width 125mm, height 300mm, the wall thickness is not less than 6mm. A baffle is installed in the box, the length of the baffle is 230mm, and it is installed along the diagonal line of the plane of 300mmx300mm.

The location and specific dimensions are shown in Figure 2, and the unit is mm. Two identical test boxes are connected together by a rotating shaft. Axis of rotation the line and the center axis of the 300mmx300mm side of the test box should be consistent, so that the test box can rotate at a constant speed along with the rotating shaft.

4.2.2 Test sieve

According to the diameter of the measured biomass briquette, select a suitable test sieve in accordance with ISO 3310-1. The aperture of the sieve is approximately equal to that of the briquette fuel.

2/3 of the diameter (or diagonal), but not more than 45mm.

For pellet fuel, a round-hole sieve with an aperture of 3.15mm is selected.

4.2.3 Balance

Sense amount 0.1g.

4.3 Sample preparation

The samples used to determine the shatter resistance shall be sampled according to the requirements of GB/T 35820, and the samples shall be stored in a closed container to prevent moisture absorption.

During the test, the sample should be at room temperature.

4.4 Test procedure

4.4.1

Weigh a sample of $1000\text{g}\pm 10\text{g}$, divide it into two evenly and put them into two test boxes respectively. For the molded fuel with a particle size greater than 12mm the material sample can be weighed $1000\text{g}\pm 50\text{g}$.

4.4.2

Turn on the rotating device, make the test box rotate 500 ± 1 revolutions at a speed of $40\text{r/min}\pm 1\text{r/min}$, then close the rotating device, and set the sample. Take it out of the two test boxes.

4.4.3

Select the test sieve in accordance with the provisions of 4.2.2, place the sample on the test sieve, and screen through mechanical vibration or artificial vibration to ensure the powder and crumbs are completely separated from the sample.

4.5 Result calculation

Calculate the shatter resistance of biomass briquettes according to formula (1).

4.6 Precision of determination of shatter resistance

The reproducibility limit and reproducibility critical difference of the determination of the shatter resistance of biomass briquettes are as specified in Table 1.

5 Determination of moisture

This standard specifies two methods for determining the moisture of biomass briquettes. Method A is the nitrogen drying method, and method B is the air drying method.

If the sample is easily oxidized at $105^{\circ}\text{C}\pm 1^{\circ}\text{C}$, method A should be selected.

In the arbitration analysis, when the general analysis sample moisture is used to calibrate and the conversion between different benchmarks, method A should be used.

Generally analyze the moisture of the sample.