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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 30393-2026

Replacing GB/T 30393-2013

Composite microbial agents for straw pretreatment in biogas production

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1.Structure and Drafting Rules of Standardization Documents". Drafting. This document replaces GB/T 30393-2013 "Compound Microbial Agent for Pretreatment of Straw in Biogas Production". Compared with GB/T 30393-2013, except for... Aside from structural adjustments and editorial changes, the main technical changes are as follows:

a) The scope of application has been changed (see Chapter 1, Chapter 1 of the.2013 edition);

b) Terms and definitions have been changed (see Chapter 3, Chapter 3 of the.2013 edition);

c) The appearance specifications of the solid compound microbial agent have been changed (see 4.2,.2013 version 4.2);

d) The moisture content specification for solid compound microbial agents is changed from "<=25%" to "<=30%" (see 4.2,.2013 edition 4.2);

e) Simplify the expression of carboxymethyl cellulase and filter paper enzyme activity to cellulase activity, and improve the technical indicator to >=

30.0 U/g (see...). 4.2 (

4.2 in the.2013 edition);

f) The activity index of lignin-degrading enzymes in solid compound microbial agents was added (see 4.2);

g) The upper limit for fecal coliform count in solid compound microbial agents is lowered to 100 CFU/g (see 4.2,.2013 edition 4.2);

h) Added technical indicators and harmlessness indicators for liquid compound microbial agents (see

i) Sampling tools were added, and the sampling methods and quantities for solid compound microbial agents were improved. Sampling methods for liquid compound microbial agents were also added. Quantity (see Chapter 5, Chapter 5 of the.2013 edition);

j) The instruments, equipment, and reagents have been revised and improved (see Chapter 6, Chapter 6 of the.2013 edition);

1 Scope

GB/T 30393-2026 is the Chinese national standard covering the microbial preparation used to break down straw before digestion - straw is abundant and cheap but its lignocellulose resists the digester, and the pretreatment is what decides whether the gas yield justifies collecting it. It replaces GB/T 30393-2013 and has been in force since 1 October 2026, with the methane potential test method GB/T 47363-2026. It was issued on 31 March 2026 and takes effect on 1 October 2026, replacing GB/T 30393-2013. The document is under the responsibility of the Ministry of Agriculture and Rural Affairs. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document specifies the technical requirements, sampling, inspection rules, labeling, packaging, transportation, and storage of biogas straw pretreatment compound microbial agents. The document describes the corresponding testing methods. This document applies to solid and liquid compound microbial agents used in the pretreatment of biogas production from crop straw. These agents can degrade other biogas-rich materials. Compound microbial agents containing lignocellulosic solid waste should be used in accordance with the guidelines.

4 Technical Requirements

4.1 Requirements for microbial strains The microbial strains used should be safe and effective. Producers should provide a classification and identification report of the strain, including the scientific name of the genus and species, morphology, and biochemistry. Complete information on the physicochemical characteristics and identification criteria is required. Producers should provide safety evaluation data for the strains. The bioengineered bacteria used should have obtained [certification/approval/etc.]. Approvals related to the biosafety of the product, allowing for large-scale release, are required. The microbial agent product must undergo acute toxicity testing and be deemed non-toxic.

4.2 Product Technical Specifications The product's technical specifications should meet the requirements of Table 1.

4.3 Product harmlessness indicators The harmlessness indicators of the product should meet the requirements of Table 2.

5 Sampling

5.1 Sampling Tools Before sampling, prepare sterile plastic bags (bottles), corrosion-resistant samplers (such as spoons, tweezers, pipettes, etc.), scissors, sealing bags, seals, and labels. Tools such as signing paper and markers.

5.2 Sampling Method and Quantity Each batch of products was sampled and inspected using a random sampling method. The sampling quantity for different specifications of products is shown in Table 3. Sampling is done on a per-piece basis. Small packages (2kg/bag or 2L/bottle and below) are considered as one piece, consisting of a carton (containing several bags/bottles). Three cases are randomly selected by machine, and one bag (bottle) is randomly selected from each case, for a total of three bags (bottles); if the package is less than 0.5kg (or 0.5L), one bag (bottle) should be randomly selected. 5 cases, with 1 bag (bottle) randomly selected from each case, for a total of 5 bags (bottles); large packages (>2kg or >2L) are sold as one case per bag (barrel), randomly selected... Five samples are randomly selected by machine, and 500.0g (or 500.0mL) is then sampled from each sample. The samples from the bulk packaging must be thoroughly mixed before sampling. Take samples under aseptic conditions, then mix all samples thoroughly and divide them into 3 bags (bottles) using the quartering method, with each bag (bottle) containing no less than 500.0g (or 500.0 mL).

6.1.1 Instruments and Equipment

6.1.1.1 Optical microscope. 10x eyepiece, 10x, 40x and 100x oil immersion objective lenses.

6.1.1.2 Constant temperature incubator. 0°C~50°C.

6.1.1.3 Constant temperature drying oven. upper temperature limit >105°C, temperature control accuracy within ±1°C.

6.1.1.4 Clean bench.

6.1.1.5 Spectrophotometer.

6.1.1.6 Analytical balance. scale division 0.001g.

6.1.1.8 Steam sterilizer.

6.1.1.9 Pipettes. volume range 0 mL to 1 mL, accurate to 1 μL.

6.1.1.10 pH meter. accurate to 0.01.

6.1.2 Reagents

6.1.2.1 Unless otherwise stated, only reagents confirmed to be of analytical purity and distilled or deionized water or water of equivalent purity shall be used in the analysis.

6.1.2.2 Sodium carboxymethyl cellulose (CMC-Na). 6.1.2.3 3,5-Dinitrosalicylic acid.

6.1.2.4 Sodium hydroxide.

6.1.2.5 Sodium potassium tartrate.

6.1.2.6 Anhydrous sodium sulfite.

6.1.2.7 Redistilled phenols.

6.1.2.8 Sodium tartrate.

6.1.2.9 Resveratrol.

6.1.2.10 Hydrogen peroxide.

6.1.2.11 Malonic acid.

6.1.2.12 Sodium malonate.

6.1.2.13 Manganese sulfate.

6.1.2.14 Acetic acid-sodium acetate buffer (

0.1 mol/L, pH 5.5).

6.2 Indicator Measurement

6.2.1 Measurement of appearance (sensory perception) Take a small sample and place it on a white enamel plate (or white plastic palette) to carefully observe the shape and texture of the sample.

6.2.2 Determination of viable bacterial count

6.2.2.1 Components and preparation methods of culture media for bacteria, fungi, and