



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 1886.388-2025

**National food safety standard - Food additive - Butylated
hydroxytoluene (BHT)**

食品安全国家标准 食品添加剂 二丁基羟基甲苯 (BHT)

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Standardization Administration of the PRC**

Table of Contents

1 Scope
2 Chemical name, molecular formula, structural formula, and relative molecular mass ...
2.1 Chemical name 2,6-Di-tert-butyl-p-methylphenol
2.2 Molecular formula C ₁₅ H ₂₄ O
2.3 Structural formula
3 Technical requirements
Annex A

1 Scope

GB 1886.388-2025 is the Chinese national food safety standard for the food additive butylated hydroxytoluene. BHT is the workhorse synthetic antioxidant of the fats and oils trade, added at parts per million to stop rancidity in edible oils, fried snacks, chewing gum base and packaging films, and it has been in continuous use and continuous argument for seventy years, which is why the purity specification is written tightly. The standard fixes the chemical name, molecular formula, structural formula and relative molecular mass, and sets the technical requirements - the sensory requirements, the assay and the limits on the impurities and heavy metals - with an annex giving the test methods and an annex giving the reference gas chromatogram of the standard solution. It applies to BHT made by alkylating p-cresol with isobutylene over an acid catalyst, then distilled and recrystallised, and takes effect on 2 March 2026.

This Standard applies to butylated hydroxytoluene (BHT), a food additive, obtained by distillation and recrystallization of the product of alkylation reaction using p-cresol and isobutylene as raw materials with an acidic catalyst (concentrated sulfuric acid or p-toluenesulfonic acid).

2 Chemical name, molecular formula, structural formula,
and relative molecular mass

2.3 Structural formula

2.4 Relative molecular mass 220.36 (based on 2022 international relative atomic mass)

3 Technical requirements

3.1 Sensory requirements The sensory requirements shall comply with the provisions of

Table 1. Table 1 -- Sensory requirements

Annex A

Test methods A.1 Warnings Some test procedures specified in the test method may lead to hazardous situations. Operators shall take appropriate safety and protective measures. A.2 General Unless otherwise specified, only reagents confirmed to be of analytical grade and grade 3 water as specified in GB/T 6682 shall be used in the analysis. Unless otherwise specified, the standard titration solutions, standard solutions for impurity determination, preparations and products used in the test method are prepared in accordance with the provisions of GB/T 601, GB/T 602 and GB/T 603. A.3 Identification tests A.3.1 Ultraviolet spectrophotometry A.3.1.1 Reagents and materials Anhydrous ethanol. guaranteed reagent. A.3.1.2 Instruments and equipment A.3.1.2.1 Ultraviolet-visible spectrophotometer. with 1 cm cuvette. A.3.1.2.2 Analytical balance. sensitivity 0.0001 g. A.3.1.3 Analytical procedure A.3.1.3.1 Preparation of sample solution Weigh approximately

0.1 g of sample, to the nearest 0.0001 g, place it in a 100 mL volumetric flask, add an appropriate amount of anhydrous ethanol, sonicate in an ultrasonic water bath for 2 min, shake well, cool, and dilute to 100 mL. Accurately measure

1.00 mL of the above solution, place it in a 100 mL volumetric flask, dilute to the mark with anhydrous ethanol, and shake well. A.3.1.3.2 Determination With anhydrous ethanol as a reference, use a 1 cm cuvette, scan the sample solution in the wavelength range of 230 nm ~ 320 nm. Maximum absorption shall be observed at a wavelength of 278 nm. A.3.2 Gas chromatography A.3.2.1 Reagents and materials Butylated hydroxytoluene (CAS. 128-37-0, molecular formula. $C_{15}H_{24}O$) standard. purity $\geq 99.0\%$. A.3.2.2 Instruments and equipment A.3.2.2.1 Gas chromatograph. equipped with a flame ionization detector. A.3.2.2.2 Analytical balance. sensitivity 0.0001 g. A.3.2.3 Analytical procedure Weigh

0.5 g of butylated hydroxytoluene standard (to the nearest 0.0001 g), place it in a 10 mL volumetric flask, dissolve and dilute to volume with anhydrous ethanol, and shake well to obtain a butylated hydroxytoluene standard solution. According to the method specified in A.4, determine the standard solution and sample solution under the same conditions, and record the chromatogram of the sample solution. The retention time of the chromatographic peak of butylated hydroxytoluene in the sample solution shall be basically consistent with that of the standard solution, with a relative deviation within 2.5 %. The gas chromatogram of the butylated hydroxytoluene standard solution is shown in Annex B. A.4 Determination of butylated hydroxytoluene A.4.1 Method summary The sample is dissolved in anhydrous ethanol and passed through a gas chromatographic column under selected operating conditions to separate the components, then detected by a flame ionization detector and quantified using the area normalization method. A.4.2 Reagents and materials A.4.2.1 Anhydrous ethanol. guaranteed reagent. A.4.2.2 Nitrogen. volume fraction not less than 99.99 %, dried and purified using silica gel or 5A molecular sieve. A.4.2.3 Hydrogen.

volume fraction not less than 99.99 %, dried and purified using silica gel or 5A molecular sieve. A.4.2.4 Air. oil-free, dried and purified using silica gel or 5A molecular sieve. A.4.3 Instruments and equipment A.4.3.1 Gas chromatograph. equipped with a flame ionization detector. A.4.3.2 Analytical balance. sensitivity 0.0001 g. A.4.4 Analytical procedure A.4.4.1 Preparation of sample solution Weigh approximately

0.5 g of sample (to the nearest 0.0001 g), place it in a 10 mL volumetric flask, dissolve in anhydrous ethanol and dilute to volume, and shake well. A.4.4.2 Reference gas chromatography conditions A.4.4.2.1 Column. weakly polar capillary column (bonded, 5 % phenyl + 95 % methylpolysiloxane capillary column), 30 m long,

0.32 mm inner diameter, 1.00 μm film thickness, or equivalent. A.4.4.2.2 Detector temperature. 250 °C. A.4.4.2.3 Injector temperature. 230 °C. A.4.4.2.4 Column temperature. 150 °C for

1.0 min, then ramp to 210 °C at 10 °C/min and hold for 3 min. A.4.4.2.5 Injection volume. 0.6 μL . A.4.4.2.6 Split ratio. 1.50. A.4.4.2.7 Carrier gas. high-purity nitrogen. A.4.4.2.8 Column inlet pressure.

0.06 MPa ~