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# International Standard



# 755/3

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## **Butan-1-ol for industrial use — Methods of test — Part 3 : Sulphuric acid colour test**

*Butanol-1 à usage industriel - Méthodes d'essai — Partie 3 : Essai de coloration à l'acide sulfurique*

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**Descriptors :** industrial products, chemical compounds, butanes, tests, sulphuric acid.

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 755/3 was developed by Technical Committee ISO/TC 47, *Chemistry*, and was circulated to the member bodies in February 1980.

It has been approved by the member bodies of the following countries :

|                     |                |                       |
|---------------------|----------------|-----------------------|
| Austria             | Germany, F. R. | Poland                |
| Belgium             | Hungary        | Romania               |
| Brazil              | India          | South Africa, Rep. of |
| Bulgaria            | Italy          | Switzerland           |
| China               | Korea, Rep. of | Thailand              |
| Czechoslovakia      | Mexico         | United Kingdom        |
| Egypt, Arab Rep. of | Netherlands    | USSR                  |
| France              | Philippines    |                       |

The member body of the following country expressed disapproval of the document on technical grounds :

Australia

International Standards ISO 755/1, ISO 755/2 and ISO 755/3 cancel and replace ISO Recommendation R 755-1968, of which they constitute a technical revision.

This International Standard has also been approved by the International Union of Pure and Applied Chemistry (IUPAC).

# Butan-1-ol for industrial use — Methods of test — Part 3 : Sulphuric acid colour test

## 1 Scope and field of application

This part of ISO 755 specifies the procedure for a sulphuric acid colour test on butan-1-ol for industrial use.

This document should be read in conjunction with ISO 755/1 (see the annex).

## 2 Reference

ISO 2211, *Liquid chemical products — Measurement of colour in Hazen units (platinum-cobalt scale)*.

## 3 Principle

Treatment of a test portion with sulphuric acid solution under specified conditions, and comparison of the colour developed with that of the same volume of an agreed colour standard.

NOTE — By agreement between the interested parties, the colour developed may be measured in Hazen units (platinum-cobalt scale), in which case the method specified in ISO 2211 should be used.

## 4 Reagents

During the analysis, use only reagents of recognized analytical grade and only distilled water or water of equivalent purity.

**4.1 Sulphuric acid**,  $\rho$  1,84 g/ml, about 96 % (m/m) solution.

**4.2 Ethanol**, 95 % (V/V).

## 5 Apparatus

Ordinary laboratory apparatus and

**5.1 Round-bottomed flask**, of capacity 250 ml, of borosilicate glass, fitted with a ground glass stopper.

**5.2 Reflux condenser**, with ground glass joint, fitting the flask (5.1).

**5.3 Burette**, of capacity 10 ml, capable of delivering 5 ml of the sulphuric acid solution (4.1) at the rate of 2 drops per second at ambient temperature.

**5.4 Two matched Nessler cylinders**, of capacity 100 ml.

**5.5 Ice-water bath**.

**5.6 Glass stirrer**, driven by a small motor.

## 6 Procedure

### 6.1 Cleaning of the apparatus

Carefully clean the flask (5.1), the reflux condenser (5.2), the Nessler cylinders (5.4) and a 100 ml measuring cylinder with the sulphuric acid solution (4.1), then rinse in running water and finally with distilled water. Eliminate distilled water by rinsing with the ethanol (4.2). Drain well and leave to dry in the air.

NOTE — Avoid greasing ground glass joints and stopcocks.

### 6.2 Test portion

Using the measuring cylinder, take 75 ml of the laboratory sample.

### 6.3 Preparation of colour standard

Prepare the agreed colour standard in accordance with the agreement between the interested parties.

NOTE — If it has been agreed to measure the colour developed in Hazen units, prepare the standard colorimetric solutions in accordance with ISO 2211, clause 6.

### 6.4 Test

Rinse the flask (5.1) with some of the laboratory sample and drain well. Place the test portion (6.2) in the flask and cool for exactly 5 min in the ice-water bath (5.5). Keeping the flask immersed in the ice-water bath, immediately start adding from the

burette (5.3) at the rate of 2 drops per second, 5,0 ml of the sulphuric acid solution (4.1). During this addition, stir the contents of the flask vigorously and continuously by means of the glass stirrer (5.6). Ensure that the temperature of the liquid in the flask does not exceed 20 °C. When the addition is complete, stopper the flask and immediately immerse the bulb of the flask in the ice-water bath (5.5) for exactly 3 min.

Fit the reflux condenser (5.2) to the flask, turn on the water supply and immerse the flask quickly in a boiling water bath so that the level of the liquid in the flask is covered by the water in the bath. Allow to stand for exactly 3 h.

At the end of this time, remove the flask, fitted with the condenser, from the boiling water bath, and cool to ambient temperature in running water.

Disconnect the condenser from the flask and transfer the contents of the flask to one of the Nessler cylinders (5.4) and compare the colour developed with that of an equivalent volume of the agreed colour standard (6.3) in the other Nessler cylinder.

NOTE — If it has been agreed to measure the colour developed in Hazen units, use the procedure specified in ISO 2211, clause 7, to compare the colours.

## 7 Expression of results

Report the colour obtained from the test portion as greater than, equal to or less than that of the agreed colour standard, or express it in Hazen units.

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## Annex

### ISO publications relating to butan-1-ol for industrial use

ISO 755/1 — General.

ISO 755/2 — Determination of acidity — Titrimetric method.

ISO 755/3 — Sulphuric acid colour test.

ISO 761 — Determination of bromide index.<sup>1)</sup>

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1) Also applicable to acetic anhydride for industrial use.

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