INTERNATIONAL STANDARD

ISO 1833-15

Second edition
2019-11

Textiles — Quantitative chemical analysis —

Part 15: Mixtures of jute with certain animal fibres (method by determining nitrogen content)

Textiles — Analyse chimique quantitative —

Partie 15: Mélanges de jute avec certaines fibres animales (méthode par détermination de la teneur en azote)

Reference number
ISO 1833-15:2019(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

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 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 38, *Textiles*.

This second edition cancels and replaces the first edition (ISO 1833-15:2006), which has been technically revised. The main changes compared to the previous edition are as follows:

— the title has been changed from “Mixtures of jute **and** certain animal fibres (method by determining nitrogen content)” to “Mixtures of jute **with** certain animal fibres (method by determining nitrogen content)”;

— in Clause 2, reference to ISO 5089 for sampling principle has been added;

— the mandatory Clause 3, "Terms and definitions", has been added;

— in Clause 9, Formula (1) has been corrected.

A list of all parts in the ISO 1833 series can be found on the ISO website.

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.

Textiles — Quantitative chemical analysis —

Part 15: Mixtures of jute with certain animal fibres (method by determining nitrogen content)

1 Scope

This document specifies a method, by determining the nitrogen content, to calculate the proportion of each component, after the removal of non-fibrous matter, in textiles made of mixtures of

— jute

with

— animal fibres.

The animal-fibre component can consist solely of hair or wool, or of any mixtures of the two.

This document is not applicable to products in which dyestuffs or finishes contain nitrogen.

NOTE Because this method differs in principle from the general method based on selective solubility set out in ISO 1833-1, it is given in a form that is complete in itself.

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 1833-1, *Textiles — Quantitative chemical analysis — Part 1: General principles of testing*

ISO 5089, *Textiles — Preparation of laboratory test samples and test specimens for chemical testing*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

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

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

4 Principle

The nitrogen content of the mixture is determined, and from this and the known or assumed nitrogen contents of the two components, the proportion of each component is calculated.

5 Reagents

All reagents shall be of recognized analytical reagent quality.

5.1 Toluene.

5.2 Methanol.

5.3 Sulfuric acid, ρ = 1,84 g/ml at 20 °C.

5.4 Potassium sulfate.

5.5 Selenium dioxide.

5.6 Sodium hydroxide solution, 400 g/l.

Dissolve 400 g of sodium hydroxide in 400 ml to 500 ml of water, and dilute to 1 l with water.

5.7 Mixed indicator.

Dissolve 0,1 g of methyl red in 95 ml of ethanol and 5 ml of water, then mix with 0,5 g of bromocresol green dissolved in 475 ml of ethanol and 25 ml of water.

5.8 Boric acid solution.

Dissolve 20 g of boric acid in 1 l of water.

5.9 Sulfuric acid, 0,01 mol/l standard volumetric solution.

6 Apparatus

Use the apparatus described in ISO 1833-1 together with those given in 6.1, 6.2 and 6.3.

6.1 Kjeldahl digestion flask, capacity 200 ml to 300 ml.

6.2 Kjeldahl distillation apparatus with steam injection, including a distillation flask.

6.3 Titration apparatus, allowing a precision of 0,05 ml.

7 Sampling and pre-treatment of laboratory test sample

7.1 Sampling

Take a laboratory test sample that is representative of the laboratory bulk sample, as described in ISO 5089, and sufficient to provide all the test specimens, each of about 1 g, that are required. Treat the laboratory test sample as described in 7.2.

7.2 Pre-treatment of laboratory test sample

Extract the air-dry sample in a Soxhlet apparatus with a mixture of 1 volume of toluene and 3 volumes of methanol for 4 h at a minimum rate of 5 cycles per hour.

Allow the solvent to evaporate from the sample in air, and remove the last traces in an oven at (105 ± 3) °C. Extract the sample in water (50 ml per gram of sample) by boiling under reflux for 30 min. Filter, return the laboratory test sample to the flask and repeat the extraction with a similar volume of new water.

Filter, remove excess water from the laboratory test sample by squeezing, suction, or centrifuging, and then allow the sample to become air-dry.

SAFETY PRECAUTIONS — The toxic effects of toluene and methanol shall be borne in mind, and full precautions shall be taken in their use.

8 Test procedure

Follow the general procedure given in ISO 1833-1 as regards the selection, drying and weighing of the specimen. Then proceed as follows.

Take from the pre-treated sample a test specimen weighing about 1 g. Dry the test specimen in a weighing bottle, cool it in a desiccator, and weigh it.

Transfer the test specimen to the dry Kjeldahl digestion flask (6.1), reweigh the weighing bottle immediately and obtain the dry mass of the test specimen by the difference.

To the test specimen in the Kjeldahl digestion flask (6.1), add in the following order: 2,5 g of potassium sulfate, 0,1 g to 0,2 g of selenium dioxide and 10 ml of sulfuric acid (5.3). Heat the Kjeldahl digestion flask (6.1), gently at first, until the whole of the fibre is destroyed, and then more vigorously until the solution becomes clear and almost colourless. Heat it for a further 15 min.

Allow the Kjeldahl digestion flask (6.1) to cool, dilute the contents carefully with 10 ml to 20 ml of water, cool, transfer the contents quantitatively to a 200 ml graduated flask and make up to volume with water to form the digest solution.

Place about 20 ml of boric acid solution in a 100 ml conical flask and place the flask under the condenser of the Kjeldahl distillation apparatus (6.2) so that the delivery tube dips just below the surface of the boric acid solution.

Transfer exactly 10 ml of digest solution to the distillation flask (6.2), add not less than 5 ml of sodium hydroxide solution to the funnel, lift the stopper slightly, and allow the sodium hydroxide solution to run slowly into the flask. If the digest solution and sodium hydroxide solution remain as two separate layers, mix them by gentle agitation. Heat the distillation flask (6.2) gently and pass into it steam from the steam injection apparatus [Kjeldahl apparatus (6.2)].

Collect about 20 ml of distillate, lower the receiver so that the tip of the delivery tube is about 20 mm above the surface of the liquid, and distil for 1 min more. Rinse the tip of the delivery tube with water, catching the washings in the receiver. Remove the receiver and replace it with a second receiver containing about 10 ml of boric acid solution, and collect about 10 ml of distillate.

Titrate the two distillates separately with sulfuric acid (5.9), using the mixed indicator. Record the total titre for the two distillates. If the titre for the second distillate is more than 0,2 ml, reject the result and repeat the distillation, using a fresh aliquot of digest solution.

Carry out a blank determination, i.e. digestion and distillation using the reagents only.

9 Calculation and expression of results

9.1 Calculate the percentage nitrogen content in the dry specimen using Formula (1):

$$A = \frac{56(v_1 - v_2)c}{m_0} \quad (1)$$

where

A is the percentage nitrogen content in the clean dry specimen;

56 is the factor derived from atomic number of nitrogen (14), stoichiometry of the reaction (2) and number of hydrogen ions per mole of sulfuric acid (2);

v_1 is the total volume, in millilitres, of sulfuric acid (5.9) used in the determination;

v_2 is the total volume, in millilitres, of sulfuric acid (5.9) used in the blank determination;

c is the concentration of the sulfuric acid (5.9), expressed in moles per litre;

m_0 is the dry mass, in grams, of the test specimen.

9.2 Using the values of 0,22 % for the nitrogen content of jute and 16,2 % for the nitrogen content of animal fibre, both values being expressed on the dry mass of the fibre, calculate the composition of the mixture using Formula (2):

$$P_A = \frac{A - 0{,}22}{16{,}2 - 0{,}22} \times 100 \quad (2)$$

where P_A is the percentage of animal fibre in the clean dry test specimen.

10 Precision

No statistical data are available at the time of publication.