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**Textiles — Quantitative chemical  
analysis —**

Part 18:  
**Mixtures of silk with other protein  
fibres (method using sulfuric acid)**

*Textiles — Analyse chimique quantitative —*

*Partie 18: Mélanges de soie avec d'autres fibres protéiques (méthode  
à l'acide sulfurique)*

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Published in Switzerland

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## 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](http://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](http://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 on 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 the following URL: [www.iso.org/iso/foreword.html](http://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 1833-18:2006), which has been technically revised. The main changes compared to the previous editions are as follows:

- the title has been changed from “Mixtures of silk and wool or hair...” to “Mixtures of silk with other protein fibres...”;
- in [Clause 1](#), “wool and animal hair” have been replaced by “other protein fibres (e.g. wool or animal hair)”;
- the mandatory [Clause 3](#) “Terms and definitions” has been added and the subsequent clauses have been renumbered;
- in [Clause 8](#) (former Clause 7), “percentage point” has been added to avoid confusion.

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](http://www.iso.org/members.html).

# Textiles — Quantitative chemical analysis —

## Part 18:

# Mixtures of silk with other protein fibres (method using sulfuric acid)

## 1 Scope

This document specifies a method, using sulfuric acid, to determine the mass percentage of silk, after removal of non-fibrous matter, in textiles made of binary mixtures of

— silk

with

— other protein fibres (e.g. wool or animal hair).

## 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*

## 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 silk fibre is dissolved from a known dry mass of the mixture with 75 % (mass fraction) sulfuric acid<sup>1)</sup>. The residue is collected, washed, dried and weighed; its mass, corrected if necessary, is expressed as a percentage of the dry mass of the mixture. The percentage of silk is found by the difference.

## 5 Reagents

Use the reagents described in ISO 1833-1 together with those given in 5.1, 5.2 and 5.3.

### 5.1 Sulfuric acid, 75 % (mass fraction).

While cooling, carefully add 700 ml of concentrated sulfuric acid ( $\rho = 1,84$  g/ml at 20 °C) to 350 ml of water. After cooling this solution to room temperature, dilute it to 1 l with water. The concentration is not critical within the range 73 % to 77 % (mass fraction) sulfuric acid.

1) Wild silk, such as tussah silk, are not completely soluble in 75 % (mass fraction) sulfuric acid.

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### 5.2 Sulfuric acid, dilute solution.

Slowly add 100 ml of concentrated sulfuric acid ( $\rho = 1,84$  g/ml at 20 °C) to 1 900 ml of water.

### 5.3 Ammonia, dilute solution.

Dilute 200 ml of concentrated ammonia solution ( $\rho = 0,88$  g/ml at 20 °C) to 1 l with water.

## 6 Apparatus

Use the apparatus described in ISO 1833-1 together with that given in [6.1](#).

### 6.1 Conical flasks, of minimum capacity 200 ml, glass stoppered.

## 7 Test procedure

Follow the general procedure described in ISO 1833-1, and then proceed as follows.

Add 100 ml of the sulfuric acid ([5.1](#)) per gram of specimen to the specimen contained in a glass-stoppered conical flask. Insert the stopper, shake vigorously (preferably in a mechanical shaker) and allow to stand for 30 min at room temperature.

Shake again and allow to stand for 30 min.

Shake a last time and filter the contents of the flask through the weighed filter crucible. Wash any remaining fibres from the flask with a little sulfuric acid ([5.1](#)).

Drain the crucible using suction and wash the residue on the crucible successively with 50 ml of the dilute sulfuric acid solution ([5.2](#)), 50 ml of water and 50 ml of the dilute ammonia solution ([5.3](#)). Each time, allow the fibres to remain in contact with the liquid for at least 10 min before applying suction.

Rinse with water, leaving the fibres in contact with the water for about 30 min.

Finally, drain the crucible using suction, dry the crucible and residue, then cool and weigh them.

## 8 Calculation and expression of results

Calculate the results as described in the general instructions of ISO 1833-1.

The value of  $d$  is 0,985.

## 9 Precision

On a homogeneous mixture of textile materials, the confidence limits of results obtained by this method are not greater than  $\pm 1$  percentage point for a confidence level of 95 %.