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Textiles — Quantitative analysis of cashmere, wool, other specialty animal fibres and their blends —

Part 1: Light microscopy method

Textiles — Analyse quantitative du cachemire, de la laine, d'autres fibres animales spéciales et de leurs mélanges —

Partie 1: Méthode de microscopie optique

Reference number
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Contents

Page

Foreword ... **iv**
Introduction ... **vi**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
4 Principle ... **2**
5 Reagents ... **3**
6 Apparatus ... **3**
7 Sampling ... **3**
8 Conditioning ... **3**
9 Preparation of test specimens ... **3**
9.1 Number of test specimens ... 3
9.2 Preparation method for test specimens ... 4
9.2.1 Loose fibre ... 4
9.2.2 Sliver ... 4
9.2.3 Yarn ... 4
9.2.4 Woven fabrics ... 4
9.2.5 Knitted fabrics ... 5
9.3 Pre-treatment of the laboratory sample ... 5
10 Procedure ... **5**
10.1 General ... 5
10.2 Setting of magnification with micrometer scale ... 5
10.3 Fibre identification and fibre diameter measurement ... 5
10.3.1 Projection microscope with graduated scale in millimetre on the screen ... 5
10.3.2 Projection microscope used to measure the fibre diameter with wedge scale or a transparent moveable linear-rule-type scale ... 6
10.3.3 Visual microscopic image analyser ... 7
10.3.4 Transmitted-light type microscope ... 7
11 Calculation and expression of test result ... **7**
11.1 Calculation of test result ... 7
11.2 Expression of test result ... 8
12 Test report ... **8**
Annex A (normative) **Drawing of the lot sample and the laboratory sample** ... **9**
Annex B (informative) **Decolouration** ... **10**
Annex C (informative) **Surface morphology of common animal fibres** ... **11**
Annex D (normative) **Density of common animal fibres** ... **44**
Bibliography ... **45**

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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 document 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).

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This document was prepared by Technical Committee ISO/TC 38, *Textiles,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 248, *Textile and textile products,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 17751-1:2016), which has been technically revised.

The main changes are as follows:

— in 3.1, a note to entry of different types of speciality animal fibres has been added;

— in 3.5, a note to entry of a micrograph has been added as Figure 1 to indicate the distal edge;

— the title of Clause 5 has been changed to “Reagents” and the reagent used is listed;

— Clause 6, “Apparatus”, has been added and the apparatus are listed with corresponding subclause numbers; subsequent clause and subclause numbers are changed accordingly;

— in 6.1 and 6.2, requirement on stage micrometer for calibration of magnification has been added;

— in 6.4, two alternative apparatus for scalpel and double blades have been added;

— Clause 7, “Sampling”, has been added and its content is rephrased to match with the property adjustment of Annex A;

— Clause 8, “Conditioning”, has been added;

— Clause 9 has been added as “Preparation of test specimens”;

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— in 9.1, the amount of test specimens has been increased, together with the requirement for a third set of test specimens to be tested in case of discrepancy on the 2 test results;

— the title of 9.2 has been changed from “Preparation of the test specimens” to “Preparation method for test specimens”;

— in 9.2.1.3, some necessary complementary operations on specimen preparation have been added;

— in 9.2.4.1, missing information on marking of masses of warp and weft yarns and on laboratory sample has been supplemented;

— in 9.3, the title has been changed from “Decolouring of the laboratory sample” to “Pre-treatment of the laboratory sample”, and the Soxhlet extraction description has been adjusted into this subclause. The requirement of reporting of pre-treatment, if applied, has been added in both 9.3.1 and 9.3.2;

— Clause 10 has been renamed as “Procedure”;

— 10.1, “General”, and its content has been added, the subsequent subclauses have been renumbered;

— in 10.3.1.1, the description has been rewritten to elaborate operation procedures and qualitative test descriptions have been added;

— the title of Clause 11 has been changed from “Calculation of test result” to “Calculation and expression of test result”;

— 11.1 and 11.2 and their subclause titles have been added, respectively;

— a new Clause 12, Test report, has been added;

— the status of Annex A has been changed from informative to normative;

— in Annex D, density of some fibres has been modified and the density of coarse rabbit has been added;

— in Annex D, a footnote has been added to coarse rabbit.

A list of all parts in the ISO 17751 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.

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Introduction

Cashmere is a high-value speciality animal fibre, but cashmere and other animal wool fibres such as sheep's wool, yak, camel, etc. exhibit great similarities in their physical and chemical properties, so that their fibre blends are difficult to distinguish from each other by both mechanical and chemical methods. In addition, these fibres show similar scale structures. It is very difficult to accurately determine the fibre content of such fibre blends by current testing means.

Research on the accurate identification of cashmere fibres has been a long undertaking. At present, the most widely used and reliable techniques include the light microscopy (LM) method and the scanning electron microscopy (SEM) method.

— The advantage of LM method is that the internal medullation and pigmentation of fibres can be observed; the disadvantage is that some subtle surface structures cannot be clearly displayed. A decolouring process needs to be carried out on dark samples for testing, while improper decolouring process can affect the judgment of fibre analyst.

— The SEM method shows complementary characteristics to those of LM method, so some types of fibres need to be identified by scanning electron microscope.

The LM and SEM methods need be used together to identify some difficult-to-identify samples in order to utilize the advantages of both methods.

It has been proven in practice that the accuracy of a fibre analysis is highly related to the ample experience, full understanding, and extreme familiarity of the fibre analyst to the surface morphology of various types of animal fibres. In addition to the textual descriptions, micrographs of different types of animal fibres are given in Annex C.

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Textiles — Quantitative analysis of cashmere, wool, other specialty animal fibres and their blends —

Part 1: Light microscopy method

1 Scope

This document specifies a method for the identification, qualitative and quantitative analysis of cashmere, wool, other speciality animal fibres, and their blends using light microscopy (LM).

It is applicable to loose fibres, intermediate-products, and final products of cashmere, wool, other speciality animal fibres, and their blends.

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 139, *Textiles — Standard atmospheres for conditioning and testing*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

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

3.1
speciality animal fibre
any type of keratin fibre taken from speciality animals (hairs) other than sheep

Note 1 to entry: Speciality animal fibres include cashmere, camel, yak, mohair, angora, rabbit, alpaca etc.

3.2
light microscope
optical instrument used to produce magnified images utilizing a visible light source

Note 1 to entry: Types of microscopes suitable for fibre identification include projection microscopes and visual microscopic image analysers. Transmitted-light type microscopes with direct graduated scale equipped on optical lens are also applicable.

3.3
scale
cuticle covering the surface of animal fibres

3.4
scale frequency
number of *scales* (3.3) along the fibre axis per unit length

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