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*Draft Indian Standard***Textiles — Qualitative and quantitative analysis of some bast fibres (flax, hemp, ramie) and their blends — Part 1: Fibre identification using microscopy methods**

Chemical Methods of Test Sectional Committee, TXD 05

NATIONAL FOREWORD

This Indian Standard intended to be adopted is identical with ISO 20706-1:2019 ‘Textiles — Qualitative and quantitative analysis of some bast fibres (flax, hemp, ramie) and their blends — Part 1: Fibre identification using microscopy methods’ issued by the International Organization for Standardization (ISO).

The text of ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

- a) Wherever the words ‘International Standard’ appear referring to this standard, they should be read as ‘Indian Standard’.
- b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In the standard intended to be adopted, reference appears to certain International Standard for which Indian Standard also exist. The corresponding Indian Standards which are to be substituted in their respective places are listed below along with their degree of equivalence for the editions indicated:

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
ISO 3696:1987 Water for analytical laboratory use — Specification and test methods	IS 1070 : 2023 Reagent grade water — Specification (<i>fourth revision</i>)	Technically Equivalent

The technical committee has reviewed the provisions of the following International Standard referred in this adopted standard and has decided that it is acceptable for use in conjunction with this standard:

<i>International/Other Standard</i>	<i>Title</i>
ISO 20705:2019	Textiles — Quantitative microscopical analysis — General principles of testing

In reporting the result of a test or analysis made in accordance with this standard, if the final value; observed or calculated, is to be rounded off, it shall be done in accordance with IS 2: 2022 ‘Rules for rounding off numerical values (*second revision*).

Extract of ISO 20706-1:2019 Textiles — Qualitative and quantitative analysis of some bast fibres (flax, hemp, ramie) and their blends — Part 1: Fibre identification using microscopy methods

Foreword

This corrected version of ISO 20706-1:2019 incorporates the following corrections:

- i) in 8.3, the SEM procedure structure has been corrected;
- ii) in 7.2.1, the missing reference to Annex H has been added.

Introduction

Among bast fibres used for textiles, flax and hemp are the most expensive. Flax is grown mainly (85 %) in a small coastal area of Northern Europe; hemp textile products are rare. Ramie is less expensive than flax and hemp: 10 % to 20 % cheaper for medium count yarns — and the difference increases for fine counts.

Flax and other bast fibres, such as hemp and ramie exhibit great similarities in their physical and chemical properties, so that their fibre specie and their blends are difficult to distinguish from each other by both mechanical and chemical methods. In addition, these fibres show nearly resembling fibre morphology. It is very difficult to accurately identify the fibre species and accurately determine the fibre content of such fibre blends by current testing means.

Research works on accurate identification of bast fibre has been a long undertaking.

In order to promote fair labelling of products and anti-counterfeiting protection, The European Confederation of Flax and Hemp (CELC) created the Bast Fibre Authority in 2013, inviting laboratories, research centres and providers of quality and control services to develop a common technical protocol. Five laboratories joined in 2013 and comparison testing were carried out between them on May–June 2014 and January–February 2015.

NOTE — CELC, founded in 1951, is a non-profit organization and an association for reflection, market analysis, industry concertation and strategic orientations. CELC is the only agro-industrial European organization that covers all stages of production and processing of flax/linen and hemp. It is the chosen representative of more than 10,000 firms in 14 European countries, promoting the fibre from plant to finished product (including sections dealing with agriculture, retting/scutching, trading, spinning, weaving and technical uses).

At present, the most widely used and reliable ones include light microscopy (LM) method and scanning electron microscopy (SEM) method. The advantage of LM method is that the internal morphology of fibres can be observed, but some subtle surface structures are not able to be clearly displayed. Decoloration process can be carried out on dark samples for testing, while improper decoloration process will affect the judgment of fibre analyst.

The scanning electron microscopy (SEM) method shows opposite characteristics to those of LM method. Therefore, some types of fibres need to be identified by scanning electron microscope.

When some samples are difficult to be identified, light microscopy method and scanning electron microscopy method should be used together to identify in order to utilize the advantages of both

methods.

It is proven in practice that accuracy of fibre analysis is highly related to the ample experience, fully understanding and extreme familiarity of the fibre analyst to the morphology of various types of bast fibres. Therefore, besides text description, a large amount of micrographs of different types of flax, hemp and ramie are given in Annex A, Annex B, Annex C and Annex D of this document

1 Scope

This document specifies methods for the identification of some bast fibres (flax, hemp, ramie) using both light microscopy (LM) and scanning electron microscopy (SEM). This document is also applicable to blends of these bast fibres and products made from them.

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.

- i) ISO 3696, Water for analytical laboratory use — Specification and test methods
- ii) ISO 20705:2019, Textiles — Quantitative microscopical analysis — General principles of testing

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 20705 and the following apply.

4 Principle

A longitudinal view image and/or cross view image of fibres representative of a test specimen is magnified to an appropriate scale/size under optical light microscope and/or SEM. All bast fibre species found in the test specimens are identified by the difference in fibre morphology among different types of certain bast fibres (flax, hemp, ramie).

FORMAT FOR SENDING COMMENTS ON BIS DOCUMENTS

(Please use A4 size sheet of paper only and type within fields indicated. Comments on each clause/sub clause/table/fig etc. be started on a fresh box. Information in column 3 should include reasons for the comments and suggestions for modified working of the clauses when the existing text is found not acceptable. Adherence to this format facilitates Secretariat's work)

Please e-mail your comments to txd@bis.gov.in or faxed on 011-23231282.

NAME OF THE COMMENTATOR/ORGANIZATION:

DOCUMENT NO: TXD 05 (20706)

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Item, Clause Sub-Clause No. Commented upon (Use Separate Box afresh)	Comments	Specific Proposal (Draft clause to be add/amended)	Remarks	Technical References and justification on which (2), (3), (4) are based
(1)	(2)	(3)	(4)	(5)