
International Standard



4912

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**Textiles — Cotton fibres — Evaluation of maturity —
Microscopic method**

Textiles — Fibres de coton — Évaluation de la maturité — Méthode par microscopie

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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 4912 was developed by Technical Committee ISO/TC 38, *Textiles*, and was circulated to the member bodies in September 1979.

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

Australia	Germany, F. R.	Romania
Belgium	Ghana	South Africa, Rep. of
Brazil	Indonesia	Spain
Bulgaria	Italy	Sweden
Canada	Japan	Switzerland
China	Korea, Rep. of	Turkey
Cyprus	New Zealand	United Kingdom
Denmark	Norway	USA
Egypt, Arab Rep. of	Poland	Venezuela
Finland	Portugal	Yugoslavia

The member bodies of the following countries expressed disapproval of the document on technical grounds :

Czechoslovakia
France
India
USSR

Textiles — Cotton fibres — Evaluation of maturity — Microscopic method

0 Introduction

The term "cotton fibre maturity" is commonly used to signify the extent of fibre wall development. For cottons of similar length and perimeter, mature cottons (thick walled) generally give fewer neps, are usually more lustrous, and dye deeper in shade than immature (thin walled) cottons.

Immature fibres have the following characteristics :

- 1) they break easily during processing;
- 2) they have a tendency to form neps;
- 3) they have a tendency for becoming entangled around leaf and trash particles, thus making cleaning more difficult and increasing the amount of fibre removed as waste;
- 4) they have an adverse effect on yarn appearance;
- 5) they do not dye evenly in shade.

Since cotton fibres vary in both wall thickness and perimeter, fibre maturity is best characterized in terms of a ratio or average percentage of maturity representing the average degree of wall thickening, independent of perimeter. These values are derived from visual comparisons of wall thickness with maximum fibre width, after the fibres have been swollen in 18 % (m/m) sodium hydroxide solution.

As measurement of the degree of wall thickening is too laborious for most practical purposes, this method of determination of maturity of cotton fibres is an indirect test. It consists of an appraisal based on judgment and experience, and is suitable for routine research purposes.

1 Scope and field of application

This International Standard specifies a method for the evaluation of the maturity of raw cotton fibres, or fibres taken from cotton articles which have not been chemically processed.

It is applicable to test specimens taken at random. Annex B describes other methods of sampling, based on fibre sorter diagrams, or arranged fibres, which permit slightly more accurate appraisals of fibre maturity.

2 References

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

ISO 1130, *Textile fibres — Some methods of sampling for testing.*

3 Definitions

For the purpose of this International Standard, the following definitions apply.

3.1 In the case of option 1, maturity ratio

3.1.1 dead fibres : Fibres which, after swelling, have a wall thickness of one-fifth or less of the maximum fibre width.

Dead fibres are present in various forms, from flat ribbons with no convolutions and little or no fibre wall (figure 2), to highly convoluted forms with somewhat greater development (figure 1).

3.1.2 normal fibres : Fibres which, after swelling, appear rod-like with a discontinuous lumen.

Normal fibres have no well defined convolutions (figures 5 and 6).

3.1.3 thin-walled fibres : Fibres which, when swollen, cannot be classed in the normal or dead groups (figures 3 and 4).

3.1.4 degree of fibre wall thickening : The ratio of actual cross-sectional area of the wall to the area of the circle with the same perimeter.

3.1.5 maturity ratio : The ratio of the degree of wall thickening to a standard degree of thickening selected arbitrarily to equal 0,577.