
INTERNATIONAL STANDARD



3060

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Cotton fibres — Determination of breaking tenacity of flat bundles

Fibres de coton — Détermination de la ténacité de rupture des faisceaux plats

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FOREWORD

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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 3060 was drawn up by Technical Committee ISO/TC 38, *Textiles*, and circulated to the Member Bodies in March 1973.

It has been approved by the Member Bodies of the following countries :

Australia	Hungary	Romania
Belgium	India	South Africa, Rep. of
Brazil	Ireland	Spain
Bulgaria	Israel	Sweden
Canada	Japan	Switzerland
Czechoslovakia	Netherlands	Thailand
Egypt, Arab Rep. of	New Zealand	Turkey
Finland	Norway	United Kingdom
France	Poland	U.S.A.

The Member Body of the following country expressed disapproval of the document on technical grounds :

Germany

Cotton fibres – Determination of breaking tenacity of flat bundles

0 INTRODUCTION

It is difficult and time consuming to estimate the average breaking tenacity of samples of cotton from tests on individual fibres. For both commercial and technical purposes, quicker estimates may be obtained from determinations made on flat bundles of parallel fibres. In this procedure, short fibres are combed out and the measured fibre strength corresponds with the breaking strength of the longer fibres in the sample.

The bundles of fibres may be secured by clamps which are either in close contact (zero gauge length) or separated to give a specified nominal gauge length. Fibre strength testing at zero gauge length is current commercial practice, although some investigations suggest that tests at a gauge length of 3,2 mm are more closely related to the tenacity of many classes of cotton yarn.

International Calibration Cotton Standards for zero gauge and national Calibration Cotton Standards for 3,2 mm gauge have been established to enable different operators to adjust their personal levels of testing to an agreed common level. These standards may also be used by operators to adjust the level of test results obtained from measurements made on instruments with different rates of loading to the agreed level for the standard.

1 SCOPE AND FIELD OF APPLICATION

1.1 This International Standard specifies a method of test for the determination of the breaking tenacity of cotton fibres arranged in a parallel manner in a flat bundle. The method applies to fibres from raw cotton, or to fibres from various stages in the manufacturing process, or to fibres separated or extracted from manufactured cotton products. The method is applicable to fibres being tested either at a nominal gauge length of zero, or at a finite gauge length.

1.2 The method is especially intended to be used with tensile strength test instruments which have been designed for specific use on flat bundles of cotton fibres (see the annexes). It may be used with other tensile strength test instruments if equipped to accommodate the fibre clamps.

2 REFERENCES

ISO/R 139, *Textiles – Standard atmospheres for conditioning and testing*.

ISO/R 220, *Method of sampling raw cotton for testing*.

3 DEFINITIONS

3.1 gauge length : The length of a specimen under specified pre-tension measured from nip-to-nip of the jaws of holding clamps in their starting position at the beginning of the test.

3.2 breaking load : The maximum load (or force) applied to a specimen in a tensile test carried to rupture.

3.3 tensile strength : The strength shown by a specimen subjected to tension, as distinct from torsion, compression or shear, and expressed as force per unit cross-sectional area of the unstrained specimen.

3.4 tenacity : The tensile force per unit of linear density of the unstrained specimen, expressed in centinewtons per tex.

3.5 breaking tenacity : The tenacity corresponding to the breaking load.

4 APPARATUS AND MATERIALS

4.1 Tensile testing instrument suitable for determining the breaking load of a flat bundle of fibres with an accuracy of 0,5 %.

NOTE – Two commercially available fibre bundle strength test instruments are described in the annexes. Other tensile testing instruments may be used if equipped with adapters to accommodate the fibre clamps.

4.2 Specimen clamps, which can be removed from the test instrument.

A total clamp thickness of 11,8 mm and a spacer with a thickness of 3,2 mm are recommended because the precision data (see 9.2) are based on clamps of these dimensions.

4.3 Clamp vice, consisting of a jig equipped with a locking screw or cam for holding the clamps while they are being loaded and unloaded. A vice having a device to indicate approximately 9 daN-cm torque is recommended.

4.4 Balance, sensitive to $\pm 0,01$ mg.

A capacity of 3 to 5 mg is sufficient for most fibre bundle strength tests, but balances having a larger capacity may be used if they have the required sensitivity.