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Série 4

WITHDRAWAL

February 2021

Selected standards in the series Textiles

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CAN/CGSB-4.2

Textile test methods

No. 8.2/ISO 2061:2010, IDT

Textiles—Determination of Twist in Yarns - Direct Counting Method (ICS 59.080.20)

No. 12.1

Tearing Strength—Single-Rip Method (ICS 59.080.30)

No. 63.4/ISO 14184-1:2011, IDT

Textiles—Determination of Formaldehyde—Part 1: Free and Hydrolyzed Formaldehyde (Water Extraction Method) (ICS 59.080.01)

No. 63.5/ISO 14184-2:2011, IDT

Textiles—Determination of Formaldehyde—Part 2: Released Formaldehyde (Vapour Absorption Method) (ICS 59.080.01)

No. 75/ISO 105-A01:2010, IDT

Textiles—Tests for Colourfastness—Part A01: General Principles of Testing (ISO 105-A01:2010, IDT) (ICS 59.080.01)

No. 4.175 Part 6/ISO 9092:2011

Textiles—Nonwovens—Definition (ISO 9092:2011, IDT) (ICS 01.040.59; 59.080.30)

CAN/CGSB-4.2

Méthodes pour épreuves textiles

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No. 63.5/ISO 14184-2:2011, IDT

Textiles – Dosage du formaldéhyde – Partie 2 : Formaldéhyde dégagé (Méthode par absorption de vapeur) (ICS 59.080.01)

No. 75/ISO 105-A01:2010, IDT

Textiles – Essais de solidité des teintures – Partie A01 : Principes généraux pour effectuer les essais (ISO 105-A01:2010, IDT) (ICS 59.080.01)

No. 4.175 Partie 6/ISO 9092:2011

Textiles – Non-tissés – Définition (ISO 9092:2011, IDT) (ICS 01.040.59; 59.080.30)



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CAN/CGSB-4.2
No. 12.1-2016

Supersedes CAN/CGSB-4.2
No. 12.1-M90

National Standard of Canada

Textile test methods

Tearing strength – Single-rip method

Withdrawn

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NATIONAL STANDARD OF CANADA

CAN/CGSB-4.2
No. 12.1-2016

Supersedes CAN/CGSB-4.2
No. 12.1-M90

Textile test methods
Tearing strength – Single-rip method

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Withdrawn

Textile test methods

Tearing strength – Single-rip method

1 Scope

This method determines the tearing strength of woven fabrics by the single-rip procedure.

The testing and evaluation of a product against this method may require the use of materials and/or equipment that could be hazardous. This document does not purport to address all the safety aspects associated with its use. Anyone using this method has the responsibility to consult the appropriate authorities and to establish appropriate health and safety practices in conjunction with any applicable regulatory requirements prior to its use.

2 Principle

The force required to propagate a single-rip tear through a fabric is recorded and its maximum values in successive equal intervals of tearing are averaged.

3 Normative references

The following normative documents contain provisions that, through reference in this text, constitute provisions of this method. The referenced documents may be obtained from the source noted below.

NOTE The address provided below was valid at the date of publication of this method.

An undated reference is to the latest edition or revision of the reference or document in question, unless otherwise specified by the authority applying this method. A dated reference is to the specified revision or edition of the reference or document in question.

3.1 Canadian General Standards Board (CGSB)

CAN/CGSB-4.2 — *Textile test methods:*

No. 1 — *Precision and accuracy of measurements*

No. 2 — *Conditioning textile materials for testing*

No. 9.1 — *Breaking strength of fabrics — Strip method — Constant-time-to-break principle.*

3.1.1 Source

The above may be obtained from the Canadian General Standards Board, Sales Centre, Gatineau, Canada K1A 1G6. Telephone 819-956-0425 or 1-800-665-2472. Fax 819-956-5740. Email ncr.cgsb-ongc@tpsgc-pwgsc.gc.ca. Web site www.tpsgc-pwgsc.gc.ca/ongc-cgsb/index-eng.html.

4 Apparatus

4.1 Constant-rate-of-extension (CRE) machine: a testing machine in which one end of the specimen is held by a virtually stationary clamp and the other end of the specimen is gripped in a clamp that is driven at a constant speed. A suitable system for detecting and recording the force applied is provided.

4.2 Constant-rate-of-traverse (CRT) machine: a testing machine in which one end of the specimen is held by a clamp driven at a constant speed while the other end is gripped in a clamp attached to a weighing mechanism of a type that permits movement of the attached clamp, e.g., as in pendulum machines. The specimen is therefore not extended at a constant rate.

NOTE Significant errors due to inertia are frequently encountered in testing machines in which the moving parts of the weighing mechanisms are massive (e.g., CRT machines), especially if such machines are used on materials with low extensibilities or are operated at high speeds. Caution should therefore be exercised in testing other than conventional materials and in testing specimens that break near the lower end of the force range of such machines.

4.3 Both types of machines shall have a suitable capacity (see 6.3) and operate with the driven clamp moving at a speed of 300 ± 10 mm/min.

NOTE Due to the presence of inertia factors in the pendulum-type testing machine, the values for tearing strength of a given fabric determined by this method on pendulum types and inertialess types of machines will usually differ. The difference is usually small and varies with the fabric under test. Values from the two types of machine cannot be correlated by any numerical factor valid for fabrics in general.

4.4 Both gripping surfaces of the clamps shall measure 25 x 50 mm or more, with the longer dimension perpendicular to the direction of the application of the force. The distance between the clamps at the start of the test shall not be more than 75 mm. The ratchet pawls of the CRT (pendulum) type machine shall be rendered inoperative during the test.

5 Test specimens

5.1 Specimens shall be cut 50 mm wide and 150 mm long. Two sets of specimens are required, one set for warp tearing strength, having the longer dimension parallel to the weft yarns, and the other set for weft tearing strength, having the longer dimension parallel to the warp yarns. Specimens shall be cut in such a manner that no two warp-tearing specimens shall involve the tearing of the same warp yarns nor any two weft-tearing specimens shall involve the tearing of the same weft yarns. The number of specimens torn shall be not less than five in each direction. If the precision with which the tearing strength to be measured is specified, refer to CAN/CGSB-4.2 No. 1 for procedures to determine the number of test specimens required. If this is not known, the number of specimens indicated in this paragraph shall be taken, subject to the provisions of 6.3. Depending upon the relationship between the tearing strength of the fabric and the capacity of the testing machine, composite specimens may be used (see 6.3).

5.2 A cut 75 mm in length is made lengthwise in each specimen, starting at the centre of one of the short edges, to form two "tails" for clamping in the testing machine. From a point on the lengthwise cut 40 mm from the end of the specimen, a pencil line shall be drawn across each tail, making an angle of 65° with the centre line of the specimen, as shown in Figure 1.

6 Procedure

6.1 Condition the specimens in accordance with CAN/CGSB-4.2 No. 2.

6.2 Secure one tail of the specimen in the upper clamp of the testing machine and the other tail in the lower clamp in such a manner that the 65° pencil lines are placed centrally along the proximal edges of the clamp faces, and the two tails present the same surface of the fabric to the operator. Start the testing machine and obtain an autographic record of the force-elongation curve corresponding to a minimum of 40 mm of tearing in the specimen.

6.3 If the tearing strength of a single specimen is less than 10% of the capacity of the testing machine, use composite specimens to obtain a tearing force of at least 10% of the capacity of the machine. In such cases, not fewer than three such composite specimens shall be tested. Composite specimens shall consist of two or more individual specimens, superimposed and clamped together in the machine, to be torn simultaneously. The individual specimens comprising each composite specimen shall be fastened together at the corners to assist in aligning them correctly in the clamps of the testing machine.

6.4 The autographic record obtained will normally consist of a succession of peak force values corresponding to the rupturing of successive yarns or groups of yarns during tearing. Disregard the initial peak force because it is frequently greater than subsequent peak forces and therefore shall not be included in the calculation of the average tearing strength. Immediately after the first peak, record the maximum force for each of the five successive 5 mm intervals of tearing in the specimens.

6.5 In “regular” tearing, the crosswise yarns are extended and ruptured successively along the line of the tear. It may occasionally be found that yarns pull out of either tail instead of breaking in proper sequence. When this occurs, the force recorded includes forces other than those required for regular tearing. This behaviour is readily detected by inspection of the specimens during or after the tearing tests. Either the portion of the record affected by this behaviour shall be rejected or the tearing behaviour of the fabric shall be reported as “irregular”.

7 Calculations

7.1 Calculate the tearing strength of each single or composite specimen tested by averaging the five maximum force values obtained from the record.

7.2 For each direction of the fabric, calculate the average tearing strength as the sum of the values obtained for all specimens (single or composite) divided by the number of individual specimens torn.

8 Report

Report the following information:

8.1 The average tearing strength values, in newtons, for warp and weft separately as the tearing strength (single-rip method) of the sample.

NOTE The average result for the specimens tested is an estimate of the true average for the material under test. A measure of the reliability of this estimate can be obtained by determining the confidence interval (CAN/CGSB-4.2 No. 1, 6.2) within which the true mean will lie for any given probability.

8.2 The type of machine used.

8.3 Any irregular tearing behaviour, such as reversion of the tear to the crosswise direction of the specimen or the withdrawal of crosswise yarns from either tail during the test.

8.4 The number of this method: CAN/CGSB-4.2 No. 12.1-2016.

All dimensions are in millimeters, unless otherwise indicated.

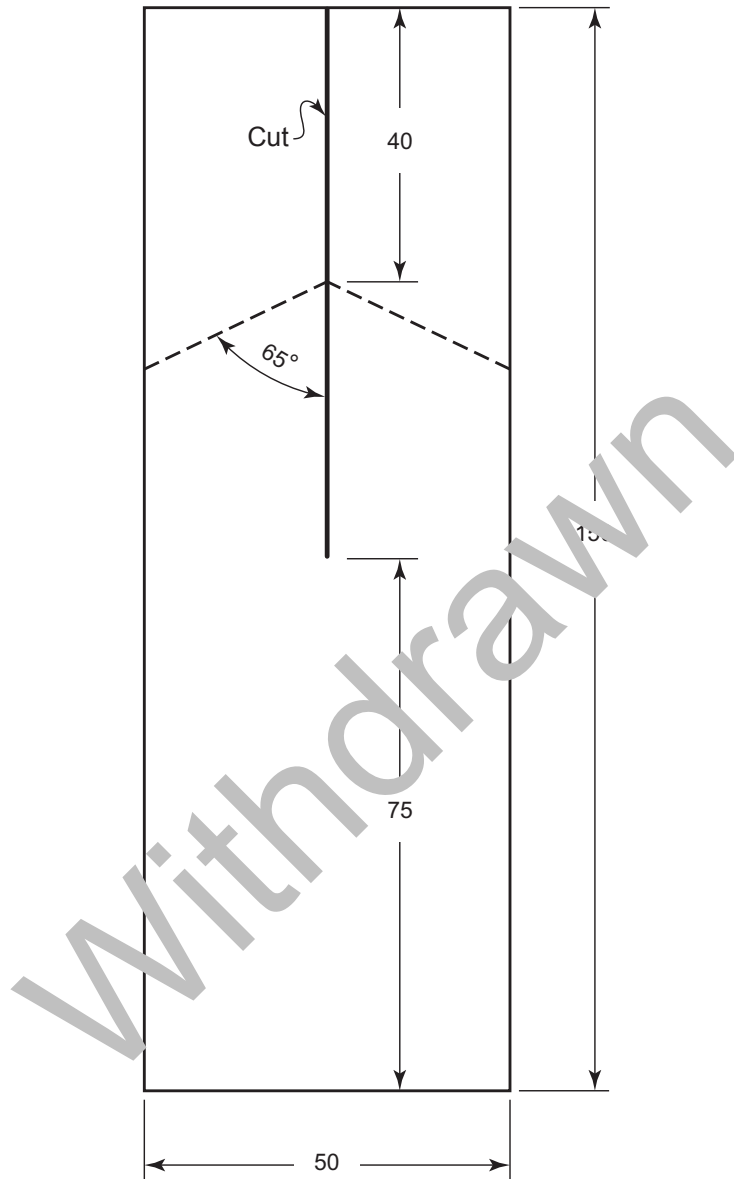


Figure 1 – Test specimen