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Footwear — Test method for slide fasteners — Strength of slide fastener pullers

Chaussures — Méthode d'essai pour les fermetures éclair — Résistance des entraînements auxiliaires des fermetures éclair

ICS 61.060

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Pour accélérer la distribution, le présent document est distribué tel qu'il est parvenu du secrétariat du comité. Le travail de rédaction et de composition de texte sera effectué au Secrétariat central de l'ISO au stade de publication.

Contents

Page

Foreword

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ISO 10734 was prepared by Technical Com, Subcommittee SC , ttee ISO/TC 216, *Footwear*, and by Technical Committee CEN/TC 309, *Footwear* in collaboration.

Footwear — Test method for slide fasteners — Strength of slide fastener pullers

1 Scope

This standard specifies a test method method intended to assess the burst strength of a closed slide fastener for footwear. The method is applicable to all types of slide fastener.

2 Normative references

The following referenced documents are indispensable for the application 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 7500-1 *Metallic materials -- Verification of static uniaxial testing machines -- Part 1: Tension/compression testing machines -- Verification and calibration of the force-measuring system*

ISO 17709 *Footwear – Sampling location,* preparation and duration of conditioning of samples and test pieces.

ISO 18454 *Footwear – Standard atmospheres for conditioning and testing of footwear an*ISO 19952 *Footwear - Vocabulary*

9952 *Footwear - Vocabulary*

3 Terms and definitions

For the purposes of this standard, the terms and definitions included in ISO 19952 apply.

4 Principle

The slider and puller of a test fastener are clamped so that the puller is perpendicular to the slider body. This standard describes the following methods:

Method 1: Tension – The force required to pull the puller from the slider in a direction parallel to the longitudinal centre line of the puller is measured.

Method 2: Torsion – The torque required to twist the puller from the slider about the longitudinal centre line of the puller is measured.

5 Apparatus and materials

5.1 Method 1 Tension

A tensile testing machine with the following characteristics shall be used:

5.1.1 A jaw separation rate of (100 ± 10) mm/min.

5.1.2 The capability of measuring forces up to 1 kN to an accuracy of 2% as specified by class 2 in ISO 7500-1

5.1.3 A means of recording either the force at all times during the test or the maximum force.

5.1.4 A jig, in one jaw, for holding the test fastener slider. A flat plate of thickness at least 1 mm, which fits between the faces of the slider and has a tapered slot to engage the slider body, is suitable. An arm attached to the place is clamped into the jaw, see figure 1a.

5.1.5 A device, fixed in the other jaw, for clamping the puller of the test fastener. A small rigid hook is suitable for pullers with a hole.

5.2 Method 2 Torsion

A test device (see Figure 1b) with the following characteristics shall be used:

5.2.1 A pair of clamps, one capable of holding the test fastener slider and the other capable of gripping the puller so that it is perpendicular to the slider.

5.2.2 A method of rotating the two clamps (5.2.1) relative to one another at a rate of (9 ± 3) degree per second.

5.2.3 The capability of measuring the torque between the two clamps to the nearest 0,5 N.m.

5.3 Minimum number of fasteners required

The minimum number of fasteners required for each version of the test is:

— Method 1 – Three

— Method 2 – Six

6 Procedure

6.1 Method 1 – Tension

6.1.1 Remove the slider from the stringers of the test fastener. Clamp the main body of the slider in the jig (5.1.4) so that it is at 90º to the axis of the tensile testing machine (5.1).

6.1.2 Attach the puller of the test fastener to the device (5.1.5) so that it is parallel to the axis of the tensile testing machine (5.1). Try to grip the puller in such a way that the device (5.1.5) will not cause an unnatural failure of the puller during the test. For example, if using a hook with a two hole puller which looks weak around its top hole, insert the hook through the bottom hole in the puller where it is fixed to the slider body.

6.1.3 Operate the tensile testing machine with a jaw separation rate of (100 ± 10) mm/min until either the puller breaks, or pulls off the slider.

6.1.4 Record the maximum force obtained in newtons to the nearest 5N and the type of failure such as:

— Slider broke at the point of attachment to the puller.

— Puller broke at the point of attachment to the slider.

— Slider broke at a point away from the attachment to the puller.

— Puller broke at a point away from the attachment to the slider.

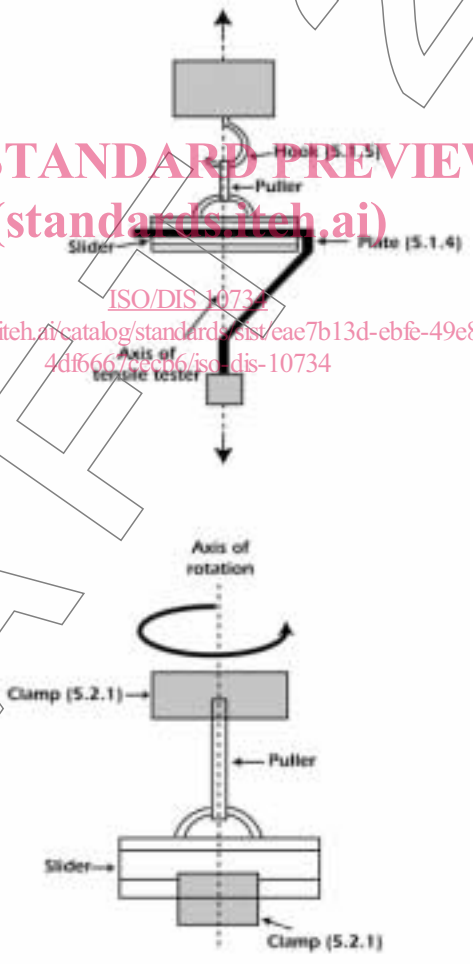

Figure 1 — 1a Tension; Fig 1b Torsion

6.1.5 If the puller failed at the point of contact with the device (5.1.5) or it appears that the device contributed to the failure, then ignore this result and repeat the test with a fresh fastener.

6.1.6 Repeat the procedure in sections 6.1.1 to 6.1.5 with the other two test fasteners.

6.1.7 Calculate the arithmetic mean of the three maximum forces (6.1.4).

6.2 Method 2 – Torsion

6.2.1 Remove the slider from the stringers of the test fastener. Clamp the slider in one of the clamps (5.2.1) and the puller in the other, so that the puller is perpendicular to the slider and the longitudinal centre line of the puller is aligned with the axis of rotation between the two clamps, see Figure 1b.

6.2.2 Operate the testing device (5.2) so that the two jaws rotate relative to each other in a clockwise direction, when looking from the puller side of the slider, at a rate of (9 ± 3) degree per second (º/s) until either:

— The puller breaks or twists off the slider.

— The jaws have rotated through a total of 180º.

6.2.3 Record the maximum torque in N.m to the nearest 0,5 N.m and the type of failure such as:

— Slider broke at the point of attachment to the puller.

— Puller broke at the point of attachment to the slider.

— Slider broke at a point away from the attachment to the puller.

— Puller broke at a point away from the attachment to the slider.

— Puller twisted but did not break.

6.2.4 If the puller is permanently twisted, estimate the amount of twist to the nearest 5º.

6.2.5 Repeat the procedure in sections 6.2.1 to 6.2.4 for another two test fasteners.

6.2.6 Calculate the arithmetic mean of the three maximum torques (6.2.3).

6.2.7 Repeat the procedure in sections 6.2.1 to 6.2.6 for another three test fasteners, this time rotating the clamps (5.2.1) in an anticlockwise direction.

7 Test report

The test report shall include the following information:

7.1 Reference to this test method.

7.2 Full description of the samples tested.

7.3 Date of testing.

7.4 The version of the test used: either method 1 or method 2.

7.5 Method 1 – the arithmetic mean maximum force as calculated in 6.1.7.

7.6 Method 2 – the arithmetic mean maximum torque for each direction of rotation as calculated in 6.2.6.

7.7 A description of the type(s) of failure.

7.8 Any deviat