



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 3903.32-2022

Footwear - Test methods for insoles - Resistance to stitch tear

鞋类 内底试验方法 缝合撕破力

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Foreword

This document was issued on 12 October 2022 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 May 2023.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

1 Scope

GB/T 3903.32-2022 covers a laboratory method for judging how well a footwear insole holds a stitch or a metal attachment, and it applies to insoles made of any material. Clause 4 describes the equipment: a drill fitted with a twist drill of 1.60 mm plus or minus 0.01 mm diameter, and a drilling jig that fixes the centre-to-centre spacing of each pair of holes, so the perforation the specimen is torn from is the same in every laboratory. Clause 5 sets the sampling and the conditioning of specimens before test, clause 6 the test procedure, clause 7 how the results are expressed and clause 8 what the test report has to state. The stitching and the metal attachments are the points at which an insole is joined to the rest of the shoe, so what is being measured is not the strength of the board on its own but the strength of the joint that holds the assembly together. Of use to footwear and materials testing laboratories, insole board and non-woven suppliers, footwear developers choosing between candidate materials, and brand quality teams fixing acceptance limits for suppliers.

This document describes a method for assessing the ability of stitches or metal attachments of footwear insoles.

This document is applicable to footwear insoles made of various materials and is used

to judge the overall quality of the insole materials, including the case where the insole is fixed with an adhesive.

2 Normative references

The following documents contain the provisions which, through normative reference in this document, constitute the essential provisions of this document. For the dated referenced documents, only the versions with the indicated dates are applicable to this document; for the undated referenced documents, only the latest version (including all the amendments) is applicable to this document.

GB/T 16825.1 Verification of static uniaxial testing machines - Part 1:

Tension/compression testing machines - Verification and calibration of the force-measuring system (GB/T 16825.1-2008, ISO 7500-1:2004, IDT)

GB/T 22049 Footwear - Standard atmospheres for conditioning and testing of footwear and components for footwear (GB/T 22049-2019, ISO 18454:2018, IDT)

GB/T 22050 Footwear - Sampling location, preparation and duration of conditioning of samples and test pieces (GB/T 22050-2008, ISO 17709:2004, IDT)

3 Terms and definitions

The following terms and definitions apply to this document.

The addresses of terminology databases maintained by ISO and IEC for standardization are as follows:

--- ISO online browsing platform: <https://www.iso.org/obp>;

--- IEC electronic encyclopedia platform: <http://www.electropedia.org/>.

3.1 resistance to stitch tear

The force required to pull a wire ring of a specified size out of a sample of insole material.

4 Test equipment and materials

4.1 Drill: It shall be equipped with a twist drill, and the diameter of the drill shall be 1.60 mm+/-0.01 mm.

4.2 Drilling jig: It shall be ensured that the center-to-center spacing of each pair of holes (see Figure 1) on the sample is $8.0 \text{ mm} \pm 0.2 \text{ mm}$.

4.3 Steel wire: The length shall be 150 mm and the diameter shall be $0.90 \text{ mm} \pm 0.01 \text{ mm}$ (20 SWG).

On a mandrel with a diameter of 7 mm, a ring with parallel arms of equal length is made through a force of 1.5 kN~2.0 kN applied to both ends of the steel wire; the arc of the steel wire ring shall be consistent with the mandrel.

Note: Deformed wires can be reused as long as the unevenness is eliminated along the mandrel.

4.4 Tensile-testing machine: It shall meet the requirements of grade 2 in GB/T 16825.1, and the moving speed shall be $100 \text{ mm/min} \pm 20 \text{ mm/min}$. It is advisable to use a tensile-testing machine that can automatically record the force value or has a pointer for the maximum force value.

4.5 The accessories of the tensile-testing machine include 4.5.1 and 4.5.2.

4.5.1 Upper clamp: It includes a rigid support plate for mounting the sample, and there is a rectangular hole on the support plate with a size of $(12.0 \pm 0.5) \text{ mm} \times (6.0 \pm 0.5) \text{ mm}$; there is a device connected to the force measuring system, which makes the force pass through the center of the hole and perpendicular to the support plate.

4.5.2 Lower clamp: It includes a device for connecting the wire ring to the drive system; the two arms of the wire ring are clamped parallel to the two guide holes 8 mm apart and equidistant from the line of action of the force applied during the test.

This connection is designed to ensure that the plane of the wire ring is parallel to the long side of the hole when the wire ring is pulled out from the center of the rigid support plate of the sample during the test.

4.6 Thickness gauge: It shall be placed on a stable base and have its own weight, so that the presser foot exerts a pressure of $49 \text{ kPa} \pm 5 \text{ kPa}$. The thickness gauge shall have a circular flat presser foot with a diameter of $10.0 \text{ mm} \pm 0.1 \text{ mm}$. The meter scale shall be

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