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NATIONAL STANDARD OF THE
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GB/T 3903.14-2021 / ISO 20874:2018

Replacing GB/T 3903.14-2005

**Footwear - Test methods for outsoles - Needle tear strength
(ISO 20874:2018, IDT)**

鞋类 外底试验方法 针撕破强度

Issued on: October 11, 2021

Implemented on: May 01, 2022

**Issued by: State Administration for Market Regulation;
Standardization Administration of the People's Republic of China.**

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Footwear - Test methods for outsoles - Needle tear strength

1 Scope

This document describes methods for determining the needle tear strength of footwear outsoles materials.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the version corresponding to that date is applicable to this document; for undated references, the latest version (including all amendments) is applicable to this document.

ISO 7500-1 Metallic materials - Calibration and verification of static uniaxial testing machines - Part 1: Tension/compression testing machines - Calibration and verification 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 and components for footwear

3 Terms and definitions

The following terms and definitions are applicable 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 electronics development platform: <http://www.electropedia.org/>

3.1

needle tear strength

Divide the maximum force required to tear the material by the needle, by the thickness of the sample, to gain the needle tear strength.

- 2 – steel needle ($\phi 1$ mm);
- 3 – sample;
- a – thickness.

Figure 1 – Example of clamps

4.4 Thickness gauge

The thickness gauge shall have a firm base, and its presser foot shall have a constant weight load, which can be applied with a pressure of $10 \text{ kPa} \pm 3 \text{ kPa}$. The presser foot of the thickness gauge shall be a circular plane whose diameter is $10 \text{ mm} \pm 0.1 \text{ mm}$. The meter scale is 0.01 mm .

5 Sampling and conditioning

Take samples in accordance with ISO 17709. Before testing, all samples shall be subjected to conditioning for at least 24 h according to ISO 18454.

The sample is a long strip with a length of $50 \text{ mm} \pm 1 \text{ mm}$ and a width of $20 \text{ mm} \pm 1 \text{ mm}$. The sample thickness shall preferably be:

- $2.0 \text{ mm} \pm 0.2 \text{ mm}$ for polymer and elastic material solid core outsoles;
- $4.0 \text{ mm} \pm 0.2 \text{ mm}$ for semi-foamed and foamed outsoles;
- original outsoles thickness for leather outsoles.

Note: Take at least 3 points of equidistant distance from the center line parallel to the long side of the sample to measure the thickness of the sample; take the average value.

Take at least 3 samples for testing. Use a suitable peeling machine to process the sample to uniform thickness. If feasible, the smooth original "skin" of the sample shall remain intact. The samples can be thus divided into the following 3 types:

- There are 2 original "skins", S_2 ;
- There is 1 original "skin", S_1 ;
- There is no original "skin", S_0 ;

The final results shall be based on the same type of samples, the sample type shall be recorded in the report.

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