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NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

ICS 83.100

G 44

GB/T 12825-2003

idt ISO 2439:1997

**Polymeric materials, cellular flexible – Determination of
hardness by indentation technique**

高聚物多孔弹性材料 凹入度法硬度测定

Issued on: January 10, 2003

Implemented on: July 01, 2003

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China.**

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Foreword

This Standard is identical to the revision of the National Standard GB/T 2825-1991, *Polymeric materials cellular flexible – Determination of hardness (indentation technique)* by adopting the International Standard ISO 2439:1997 *Flexible cellular polymeric materials – Determination of hardness (indentation technique)*.

Compared with GB/T 12825-1991, this Standard makes the following main technical changes:

- 1) In 6.3 of this Standard, test pieces are permitted for testing at either 16 h or 48 h after manufacture, provided that the mean result does not differ by more than +10%, while in the original standard, tests are permitted only at 72 h after manufacture.
- 2) Delete three test conditions specified in sub-clause 6.3 “parking” of the original standard.

This Standard replaces GB/T 12825-1991 since the date of implementation.

This Standard was proposed by the former State Petroleum and Chemical Industry Bureau.

This Standard shall be under the jurisdiction of National Technical Committee on Rubber and Rubber Products Standardization, Sub-Technical Committee on Latex Products.

Drafting organization of this Standard: China Rubber Group Zhuzhou Rubber and Plastics Industry Research and Design Institute.

Main drafters of this Standard: Zhao Ping, Song Yanfei.

This Standard was first published in 1991.

Polymeric materials, cellular flexible – Determination of hardness by indentation technique

WARNING: Persons using this Standard shall be familiar with normal laboratory practice. This Standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

1 Scope

This Standard specifies three methods for determining the indentation, hardness of flexible cellular materials:

method A (indentation hardness index), which gives a single indentation measurement for laboratory test purposes;

method B (indentation hardness characteristics), which provides information about the shape of the hardness indentation curve;

method C (indentation hardness check), which is a quick procedure suitable for quality control testing.

This Standard is applicable only to latex, urethane foam and PVC foam of the open cell type.

Note: The indentation hardness of flexible cellular materials is a measure of their load-bearing properties. The methods specified can be used for testing finished articles and for the characterization of bulk material.

The results obtained by these methods relate only to the test conditions specified and cannot, in general, be used directly for design purposes.

2 Normative references

The following standard contains provisions which, through reference in this text, constitute provisions of this Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below.

deflection, release the load at the same rate. Repeat this loading and unloading twice more, then proceed in accordance with 7.2, 7.3 or 7.4 as appropriate.

7.2 Method A - Determination of indentation hardness index

Note the corresponding force, in newtons, according to the test method in 7.1, and release the force.

Only the result of a test conducted by method A, on the standard size test piece, without plying, shall be known as the indentation hardness index.

7.3 Method B - Determination of indentation hardness characteristics

Immediately after the third unloading (see 7.1), the following steps shall be carried out:

Indent the test piece by $25\% \pm 1\%$ of the thickness; maintain this indentation for a period of $30\text{ s} \pm 1\text{ s}$; measure the force;

Increase the indentation to $40\% \pm 1\%$; maintain this indentation for a period of $30\text{ s} \pm 1\text{ s}$; measure the force;

Increase the indentation to $65\% \pm 1\%$ of the thickness; maintain this indentation for a period of $30\text{ s} \pm 1\text{ s}$; measure the force.

The results of a test conducted by method B on a standard test piece shall be known as the standard indentation hardness characteristics of that material. If a product is tested, the results shall be known as the product indentation hardness characteristics.

Note: Convenient means of expressing the results obtained by method B are indentation factors, which are the ratios of the forces required to obtain the indentation of 25 % and 65% divided by the force required to obtain the indentation of 40%.

7.4 Method C - Determination of indentation hardness check

Immediately after the third unloading (see 7.1) start the autographic recording, or bring back the tell-tale needle of the force gauge, and indent the test piece to $40\% \pm 1\%$ of the thickness. Record the force, in newtons, using the tell-tale needle or the instantaneous maximum of the autographic recorder. Release the force.

The results of a test conducted by method C shall be known as the indentation hardness check.

Note: This is a faster, quality-control test for indentation hardness. The variability of results obtained in this way will be higher. It shall also be noted that the results obtained in this way may be related to results obtained with method A but will usually be higher.

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