

Australian Standard™

Methods of test for elastomers

Method 15.1: International rubber hardness

[ISO title: Rubber, vulcanized or thermoplastic—Determination of hardness
(hardness between 10 IRHD and 100 IRHD)]



Standards Australia

This Australian Standard was prepared by Committee RU/3, Analysis and Testing of Elastomers. It was approved on behalf of the Council of Standards Australia on 15 September 2000 and published on 1 November 2000.

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Australasian Plastics and Rubber Institute
Australian Chamber of Commerce and Industry

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RECONFIRMATION

OF

AS 1683.15.1–2000

Methods of test for elastomers

Method 15.1: International rubber hardness

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NOTES

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PREFACE

This Standard was prepared by the Standards Australia Committee RU/3, Analysis and Testing of Elastomers to supersede—

AS

1180	Methods of test for hose made from elastomeric materials
1180.9A—1973	Method 9A: Hardness of vulcanized rubbers of standard hardness (35 to 85 IRHD)
1180.9B—1973	Method 9B: Hardness of vulcanized rubbers of low hardness (10 to 35 IRHD)
1180.9C—1973	Method 9C: Hardness of vulcanized rubbers of high hardness (85 to 100 IRHD)
1683	Methods of test for elastomers
1683.15.1—1990	Method 15.1: International rubber hardness

The objective of this Standard is to provide manufacturers and suppliers and users with methods for the determination of the hardness of vulcanized or thermoplastic rubbers on flat surfaces and the apparent hardness of curved surfaces.

This edition is in alignment with ISO and removes the duplication of the equivalent procedures given in the superseded Standards.

This Standard is identical with and has been reproduced from ISO 48:1994, *Rubber, vulcanized or thermoplastic—Determination of hardness (hardness between 10 IRHD and 100 IRHD) (incorporating Amendment 1)*. Amendment 1 is included at the end of the ISO text and the affected text is indicated by a marginal bar.

The terms ‘normative’ and informative have been used in this Standard to define the application of the annex to which they apply. A ‘normative’ annex is an integral part of a Standard, whereas an ‘informative’ annex is only for information and guidance.

As this Standard is reproduced from an International Standard, the following applies:

- (a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.
- (b) In the source text ‘this International Standard’ should read ‘this Australian Standard’.
- (c) A full point should be substituted for a comma when referring to a decimal marker.

There are no equivalent Australian Standards to the normative references listed in Clause 2.

The hardness test specified in this Standard is intended to provide rapid measurement of rubber stiffness, unlike hardness tests on other materials which measure resistance to permanent deformation.

Hardness is measured from the depth of indentation of a spherical indent, under a specified force, into a rubber test piece. An empirical relationship between depth of indentation and Young’s modulus for a perfect elastic isotropic material has been used to derive a hardness scale which may be used for most rubbers.

When it is required to determine the value of Young’s modulus itself, an appropriate test method should be used, for example that described in ISO 7743:1989, *Rubber, vulcanized or thermoplastic—Determination of compression stress-strain properties*.

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NOTES

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1 Scope

This International Standard specifies four methods for the determination of the hardness of vulcanized or thermoplastic rubbers on flat surfaces:

Method N	Normal test
Method H	High-hardness test
Method L	Low-hardness test
Method M	Microtest

and four methods for the determination of apparent hardness of curved surfaces using methods N, H, L and M, respectively:

Methods CN, CH, CL and CM.

The methods differ primarily in the diameter of the indenting ball and the magnitude of the indenting force, these being chosen to suit the particular application. The range of applicability of each is indicated in figure 1.

Method N: The normal test for hardness is the appropriate method for test pieces of thickness greater

than or equal to 4 mm and is preferably used for rubbers in the range 35 IRHD to 85 IRHD but may be used for those in the range 30 IRHD to 95 IRHD.

Method H: The appropriate method for test pieces of thickness greater than or equal to 4 mm and hardness in the range 85 IRHD to 100 IRHD.

Method L: The appropriate method for test pieces of thickness greater than or equal to 6 mm and hardness in the range 10 IRHD to 35 IRHD.

NOTE 1 The value of hardness obtained by method N within the ranges 85 IRHD to 95 IRHD and 30 IRHD to 35 IRHD may not agree precisely with that obtained using method H or method L, respectively. The difference is not normally significant for technical purposes.

Method M: The microtest for hardness is essentially a scaled-down version of the normal test method N, permitting the testing of thinner and smaller test pieces. It is the appropriate method for test pieces of thickness less than 4 mm and is preferably used for rubbers in the range 35 IRHD to 85 IRHD but may be used for those in the range 30 IRHD to 95 IRHD.

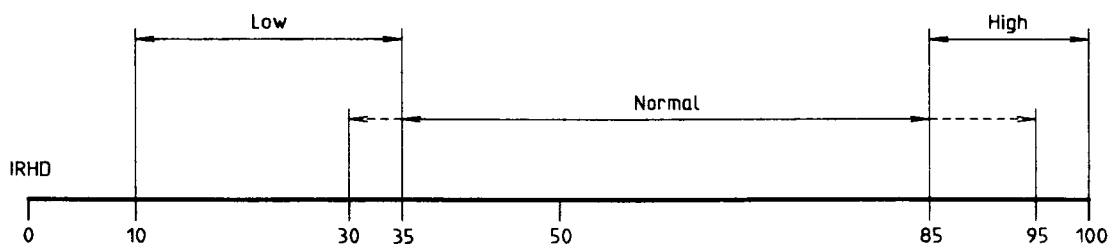


Figure 1 — Range of applicability