STANDARDS AUSTRALIA

RECONFIRMATION

OF
AS 1683.12–2001
Methods of test for elastomers
Method 12: Rubber, vulcanized or thermoplastic–Determination of tear strength (trouser, angle and crescent test pieces)

RECONFIRMATION NOTICE

Major stakeholders of this publication have reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

Certain documents referenced in the publication may have been amended since the original date of publication. Users are advised to ensure that they are using the latest versions of such documents as appropriate, unless advised otherwise in this Reconfirmation Notice.

Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 29 August 2018.

NOTES

AS 1683.12—2001
ISO 34-1:1994
ISO 34-1:1994/Cor.1:1999
Reconfirmed 2018

Australian Standard™

Methods of test for elastomers

Method 12: Rubber, vulcanized or thermoplastic—Determination of tear strength (trouser, angle and crescent test pieces)

PREFACE

This Standard was prepared by the Standards Australia Committee RU-003, Analysis and Testing of Elastomers to supersede AS 1683.12:1992, *Methods of test for elastomers* Method 20: *Rubber, vulcanized or thermoplastic—Determination of tear strength (trouser, angle and crescent test pieces)*.

The objective of this Standard is to provide manufacturers and users of elastomeric materials with the methods for the determination of tear strength of vulcanized rubber using trouser, angle and crescent test pieces.

This Standard is identical with and has been reproduced from ISO 34-1:1994, *Rubber—vulcanized or thermoplastic—Determination of tear strength,* Part 1: *Trouser, angle and crescent test pieces* and incorporating Technical Corrigendum 1:1999. Technical Corrigendum 1 is included at the end of the ISO text and the affected figure is indicated by a margin bar.

The term 'informative' has been used in this Standard to define the application of the annex to which it applies. An 'informative' annex is only for information and guidance.

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

(a) Its number appears on the cover and title page while the International Standard number appears only on the cover.

(b) In the source text, 'this part of ISO 34' should read 'this Australian Standard'.

(c) A full point substitutes for a comma when referring to a decimal marker.

References to international Standards should be replaced by equivalent Australian Standards as follows:

ISO		AS	
471	Rubber—Standard temperatures, humidities and times for the conditioning and testing of test pieces	1683	Methods of test for elastomers
		1683.20	Method 20: Standard temperatures, humidities and times for conditioning and testing
1826	Rubber, vulcanized—Time-interval between vulcanization and testing—Specification	—	

ISO		AS
3383	Rubber—General directions for achieving elevated or subnormal temperatures for test purposes	—
4648	Rubber, vulcanized or thermoplastic—Determination of dimensions of test pieces and products for test purposes	—
5893	Rubber and plastics test equipment—Tensile, flexural and compression types (constant rate of transverse)—Description	—
6133	Rubber and plastics—Analysis of multi-peak traces obtained in determinations of tear strength and adhesion strength	—
ISO/TR		
9272	Rubber and rubber products—Determination of precision for test method standards	—

1 Scope

This part of ISO 34 specifies three test methods for the determination of the tear strength of vulcanized rubber, namely

— Method A, using a trouser test piece;

— Method B, using an angle test piece, with or without a nick of specified depth;

— Method C, using a crescent test piece with a nick.

The value of tear strength obtained depends on the shape of the test piece, speed of stretching and temperature of test. It may also be susceptible to grain effects in vulcanized rubber.

Method A: Using a trouser test piece

Method A, using the trouser test piece, is preferred because it is not sensitive to the length of the cut, unlike the other two test pieces in which the nick has to be very closely controlled. In addition, the results obtained are more easily related to the fundamental tear properties of the material and are less sensitive to modulus effects (provided that the leg extension is negligible) and the rate of propagation of the tear is directely related to the rate of strip separation. With some rubbers, the propagation of tear is not smooth (knotty tear), and analysis of results may be difficult.

Method B, procedure (a): Using an angle test piece without nick

This test is a combination of tear initiation and propagation. Stress is built up at the point of the angle until it is sufficient to initiate a tear and then further stresses propagate this tear. But it is only possible to measure the overall force required to rupture the test piece, and, therefore, the force cannot be resolved into two components producing (1) initiation and (2) propagation. [1]

Method B, procedure (b): Using an angle test piece with nick

This test measures the force required to propagate a nick already produced in the test piece. The rate of propagation is not directly related to the jaw speed. [2]

Method C: Using a crescent test piece

This test measures the force required to propagate a nick already produced in the test piece and the rate of propagation is not related to the jaw speed.

NOTE 1 A separate method for the determination of the tear strength of small test pieces of vulcanized rubber (Delft test pieces) is specified in ISO 816:1983, *Rubber, vulcanized — Determination of tear strength of small test pieces (Delft test pieces)* (to be ISO 34-2).

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 34. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 34 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 471:1983, *Rubber — Standard temperatures, humidities and times for the conditioning and testing of test pieces.*