

Australian/New Zealand Standard™

Methods of test for pulp and paper

**Method 453: Determination of bending
resistance—Constant rate of deflection**



AS/NZS 1301.453:2016

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee PK-019, Methods of Test for Pulp and Paper. It was approved on behalf of the Council of Standards Australia on 19 September 2016 and by the New Zealand Standards Approval Board on 17 August 2016.
This Standard was published on 18 October 2016.

The following are represented on Committee PK-019:

Appita
Australian Forest Products Association
New Zealand Paper Forum
Scion

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard which should include any amendments which may have been published since the Standard was purchased.

Detailed information about Joint Australian/New Zealand Standards can be found by visiting the Standards Web Shop at www.saiglobal.com or Standards New Zealand web site at www.standards.govt.nz and looking up the relevant Standard in the on-line catalogue.

For more frequent listings or notification of revisions, amendments and withdrawal, Standards Australia and Standards New Zealand offer a number of update options. For information about these services, users should contact their respective national Standards organization.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of Standards Australia or the New Zealand Standards Executive at the address shown on the back cover.

Australian/New Zealand Standard™

Methods of test for pulp and paper

Method 453: Determination of bending resistance—Constant rate of deflection

Originally in Australia as AS 1301.453s—1991.
Previous and first joint edition AS/NZS 1301.453s:1998.
Completely revised and redesignated as AS/NZS 1301.453:2016.

COPYRIGHT

© ISO 2016 – All rights reserved

© Standards Australia Limited/Standards New Zealand

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Australia) or the Copyright Act 1994 (New Zealand).

Jointly published by SAI Global Limited under licence from Standards Australia Limited, GPO Box 476, Sydney, NSW 2001 and by Standards New Zealand, PO Box 1473, Wellington 6011.

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee PK-019, Methods of Test for Pulp and Paper, to supersede AS/NZS 1301.453s:1998, *Methods of test for pulp and paper*, Method 453s: *Bending resistance of paper and board—Constant rate of deflection*, (reconfirmed 2013).

The objective of this Standard is to provide a method for determining the resistance to bending of paper and board at a constant rate of deflection.

This Standard is identical with, and has been reproduced from ISO 2493-1:2010, *Paper and board—Determination of bending resistance*, Part 1: *Constant rate of deflection*.

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

- (a) In the source text ‘this part of ISO 2493’ should read ‘this Australian/New Zealand Standard’.
- (b) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

<i>Reference to International Standard</i>	<i>Australian/New Zealand Standard</i>
ISO	AS/NZS
186 Paper and board—Sampling to determine average quality	1301 Method of test for pulp and paper 1301.417s Method 417s: Sampling to determine average quality
536 Paper and board—Determination of grammage	1301.405s Part 405s: Grammage of non-creped paper and board

The normative reference ISO 187 has not been adopted as an Australian/New Zealand Standard.

In Australia and New Zealand the following standards are generally used:

AS/NZS 1301.414s:2006, *Methods of test for pulp and paper*, Methods 414s: *Conditioning of paper for testing*.

AS/NZS 1301.415s:2008, *Methods of test for pulp and paper*, Methods 415s: *Standard atmosphere for testing paper and board and procedure for monitoring the atmosphere*.

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.

CONTENTS

1	Scope	1
2	Normative references	1
3	Terms and definitions	2
4	Principle	2
5	Apparatus	2
6	Calibration	3
7	Sampling	3
8	Conditioning	3
9	Preparation of test pieces	4
10	Procedure	4
11	Calculation and expression of results	5
12	Test report	5
	Annex A (informative) Precision	6
	Bibliography	8

INTRODUCTION

In ISO 2493:1992, two principles for determining the bending resistance were incorporated in the same standard, although the two principles were very different.

One principle involved the deflection of an equal number of test pieces with opposing surfaces towards the direction of deflection; this principle is described in this part of ISO 2493.

The other principle used a Taber-type tester, where the test piece was inserted and deflected to the top side and then, without changing the test piece, it was deflected in the opposite direction. This principle is described in ISO 2493-2. The method is based on TAPPI Test Method T 489 om-04^[4].

AUSTRALIAN/NEW ZEALAND STANDARD

Methods of test for pulp and paper

Method 453:

Determination of bending resistance—Constant rate of deflection

1 Scope

This part of ISO 2493 specifies procedures, based on the two-point loading principle, for determining the bending resistance of paper and board.

NOTE 1 See ISO 5628^[1] for a detailed description of the two-point loading principle.

This part of ISO 2493 applies to the measurement of the bending resistance within the range 20 mN to 10 000 mN. It is not applicable to corrugated board but can be applicable to the components of such board.

The bending angle is 15° and the bending length is 50 mm.

For samples having a bending resistance that is too low to measure with a bending length of 50 mm, a shorter bending length, i.e. 10 mm, can be used.

IMPORTANT — The results obtained when using different bending lengths will not be comparable.

For boards that tend to be permanently deformed if bent through 15°, the half bending angle, i.e. 7,5°, can be used.

NOTE 2 Taber-type testers and testers using the principle of constant rate of deflection do not give comparable results. For this reason, ISO 2493:1992 has been divided into two parts.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 186, *Paper and board — Sampling to determine average quality*

ISO 187, *Paper, board and pulps — Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples*

ISO 536, *Paper and board — Determination of grammage*