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Reconfirmed 2017

AS/NZS 1301.459rp:2006

Australian/New Zealand Standard™

Methods of test for pulp and paper

Method 459rp: Zero-span wet tensile strength of pulp (ISO 15361:2000, MOD)

Appita

STANDARDS Australia

STANDARDS NEW ZEALAND PAEREWA AOTEAROA

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 15 June 2006 and on behalf of the Council of Standards New Zealand on 30 June 2006.
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The following are represented on Committee PK-019:

Australian Plantation Products and Paper Industry Council (A3P)
Appita
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National Association of Forest Industries

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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 either Standards Australia or Standards New Zealand at the address shown on the back cover.

This Standard was issued in draft form for comment as DR 06171.

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

RECONFIRMATION

OF

AS/NZS 1301.459rp:2006
Methods of test for pulp and paper
Method 459rp: Zero-span wet tensile strength of pulp (ISO 15361:2000, MOD)

RECONFIRMATION NOTICE

Technical Committee PK-019 has 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.

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The following are represented on Technical Committee PK-019:

Appita
Monash University
New Zealand Paper Forum
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NOTES

Australian/New Zealand Standard™

Methods of test for pulp and paper

Method 459rp: Zero-span wet tensile strength of pulp (ISO 15361:2000, MOD)

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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 1301.459rp:1998.

The objective of this Standard is to provide a method to assess the tensile strength of pulp fibres while minimizing the impact of fibre network and fibre bonding interactions upon the measurement.

This Standard is an adoption with national modifications and has been reproduced from ISO 15361:2000ISO 15361:2000, MOD, *Pulps—Determination of zero-span tensile strength, wet or dry*. The modifications are listed in Appendix ZZ.

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 'International Standard' should read 'this Australian/New Zealand Standard'.

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

The term 'normative' has been used in this Standard to define the application of the annex or appendix to which it applies. A 'normative' annex or appendix is an integral part of a Standard.

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

Reference to International Standard		*Australian/New Zealand Standard*	
ISO		AS/NZS	
187	Paper, board and pulps—Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples	1301	Methods of test for pulp and paper
		1301.414s	Method 414s: Conditioning of paper for testing
		1301.415s	Method 415s: Standard atmosphere for testing paper and board and procedure for monitoring the atmosphere
287	Paper and board—Determination of moisture content—Oven-drying method	—	
536	Paper and board—Determination of grammage	1301.405s	Method 405s: Grammage of non-creped paper and board
1924	Paper and board—Determination of tensile properties	—	
1924-2	Part 2: Constant rate of elongation method		
5263	Pulps—Laboratory wet disintegration	—	
5264	Pulps—Laboratory beating	—	
5264-1	Part 1: Valley beater method		
5264-2	Part 2: PFI mill method		

ISO		AS/NZS
5269	Pulps—Preparation of laboratory sheets for physical testing	—
5269-1	Part 1: Conventional sheet-former method	
5269-2	Part 2: Rapid-Köthen method	
7213	Pulps—Sampling for testing	—

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INTRODUCTION

Tensile strength data at a span length of zero may be used to assess the retention of fibre strength through the entire fibre-processing chain, providing opportunities to optimize fibre characteristics and utilization in various paper grades. Tensile strength values determined at a span length of zero contribute to our understanding of finished sheet strength and are of increasing importance in measuring the impact of new pulping, bleaching and papermaking processes on fibre characteristics.

The zero-span tensile test may be used to determine the strength of pulp fibres when beaten under laboratory conditions, regardless of the laboratory beating procedure used. Measurement of zero-span tensile strength, in conjunction with tensile strength as well as other physical properties, is useful in optimizing new fibre-processing techniques and maximizing utilization of new fibre sources such as recycled fibres. Papers referenced in the bibliography give further information on the use of zero-span tensile measurements.

The clamping pressure utilized in zero-span testing ensures a maximum clamping effect but cannot totally prevent micro-slippage, whereby the tensile load transmitted in the clamped fibres is dissipated by frictional shear into the clamping jaws. This micro-slippage means that the ends of some fibres will slip out from beneath the clamping jaw, thereby diminishing the number of fibres carrying the load at tensile failure. In addition, if kinks in fibres are not removed in the beating process, test results may be diminished. For these reasons, careful interpretation of the zero-span tensile strength value should be exercised in order to separate effects due to the relative number of fibres which are carrying the load at failure, and the effects due to the tensile strength of the individual fibres present in the aggregate.

The zero-span strength values may be different if the samples are tested dry and conditioned, rewetted or wet (never dried).

NOTES

AUSTRALIAN/NEW ZEALAND STANDARD

Methods of test for pulp and paper

Method 459rp:
Zero-span wet tensile strength of pulp
(ISO 15361:2000, MOD)

1 Scope

This International Standard specifies the procedure for determining the tensile strength of laboratory sheets at a test span which is initially zero. It is applicable to all kinds of fibres, including recycled fibres. The laboratory sheets can be tested either dry, rewetted, or never dried.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

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

ISO 287, *Paper and board — Determination of moisture content — Oven-drying method.*

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

ISO 1924-2, *Paper and board — Determination of tensile properties — Part 2: Constant rate of elongation method.*

ISO 5263, *Pulps — Laboratory wet disintegration.*

ISO 5264-1, *Pulps — Laboratory beating — Part 1: Valley beater method.*

ISO 5264-2, *Pulps — Laboratory beating — Part 2: PFI mill method.*

ISO 5269-1, *Pulps — Preparation of laboratory sheets for physical testing — Part 1: Conventional sheet-former method.*

ISO 5269-2, *Pulps — Preparation of laboratory sheets for physical testing — Part 2: Rapid-Köthen method.*

ISO 7213, *Pulps — Sampling for testing.*

3 Terms and definitions

For the purposes of this International Standard, the following terms and definitions apply.

3.1
tensile strength
maximum force per unit width that a test piece of the sample will withstand before breaking under the conditions defined in ISO 1924-2