AS/NZS 1301.407:2017

Australian/New Zealand Standard™

Methods of test for pulp and paper

Method 407: Ring crush test

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The following are represented on Committee PK-019:

Appita
Monash University
New Zealand Paper Forum
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Australian/New Zealand Standard™

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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 1301.407s:1997.

The objective of this Standard is to provide a measure of the resistance to crushing due to in-plane compressive forces that can occur during shipment or storage of fibreboard shipping containers.

This Standard is an adoption with national modifications and has been reproduced from ISO 12192:2011, *Paper and board—Determination of compressive strength—Ring crush method* and has been varied as indicated to take account of Australian/New Zealand conditions. The modifications are specified in the normative Appendix ZZ. Modifications to the design and use of a mechanical test piece feeder are provided in the informative Appendix ZA.

Similar Standards that are also used in place of this Standard are TAPPI T818, *Ring Crush of Paperboard (flexible Beam Method)* and TAPPI T822, *Ring Crush of Paperboard (Rigid Support Method)*.

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

(A) In the source text 'International Standard' 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:

Reference to International Standard		*Australian Standard*	
ISO		AS/NZS	
		1301	Methods of test for pulp and paper
186	Paper and board—Sampling to determine average quality	1301.417s	Sampling to determine average quality
534	Paper and board—Determination of thickness, density and specific volume	1031.426s	Paper and board—Determination of thickness, density and specific volume

Only normative references that have been adopted as Australian/New Zealand Standards have been listed.

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INTRODUCTION

Fibreboard shipping containers are frequently subjected to in-plane compressive forces during shipment or storage. Therefore, resistance to crushing is an important measure of the performance characteristics of the containers.

The resistance to crushing depends on the design of the containers and on the in-plane crush resistance of the components of the board from which it is made. The in-plane crush resistance of these components can be measured by the ring crush test.

AUSTRALIAN/NEW ZEALAND STANDARD

Methods of test for pulp and paper

Method 407:
Ring crush test

1 Scope

This International Standard specifies a method for the determination of the edgewise compressive strength (ring crush resistance) of paper and paperboard, especially board used in the manufacture of fibreboard shipping containers.

This International Standard is applicable to all paper and paperboard with a thickness in the range 100 µm to 580 µm. For samples having a thickness below 280 µm, test values can result from a combination of both buckling failure and pure compression.

NOTE For samples having a thickness exceeding 580 µm, strain within the sample arising from bending the test piece into a cylinder might affect the test result (see References [6] and [7] in the Bibliography).

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 534, *Paper and board — Determination of thickness, density and specific volume*

ISO 13820, *Paper, board and corrugated fibreboard — Description and calibration of compression-testing equipment*

3 Terms and definitions

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

3.1
compressive strength
maximum compressive force per unit length that a test piece of paper or board can withstand until the onset of failure

NOTE The compressive strength is expressed in kilonewtons per metre.

3.2
ring crush resistance
maximum compressive force per unit length that a narrow test piece bent into the form of a cylinder (ring) can withstand on its edge without failure under the conditions defined in this International Standard

NOTE The ring crush resistance is expressed in kilonewtons per metre.

3.3
ring-crush-resistance index
ring crush resistance divided by the grammage

NOTE The ring-crush-resistance index is expressed in kilonewton metres per gram.