

Australian/New Zealand Standard™

**Methods of test for pulp and paper**

**Method 448s: Tensile strength of paper  
and paperboard (constant rate of  
elongation method)**



## **AS/NZS 1301.448s:2007**

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 22 December 2006 and on behalf of the Council of Standards New Zealand on 19 December 2006.  
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The following are represented on Committee PK-019:

Australian Plantation Products and Paper Industry Council (A3P)  
Appita  
CSIRO Forestry and Forest Products  
Ensis Papro, SCION  
National Association of Forest Industries

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# Australian/New Zealand Standard™

## Methods of test for pulp and paper

### Method 448s: Tensile strength of paper and paperboard (constant rate of elongation method)

Originated as AS 1301.448s—1984.  
Second edition 1991.  
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## Foreword

This standard was prepared by Joint Technical Committee PK-019, Methods of Test for Pulp and Paper, as part of AS/NZS 1301, *Methods of test for pulp and paper*.

This edition cancels and replaces AS 1301.448s—1991.

This method conforms to ISO 1924-2, except that this method does not require all tests to be rejected if more than 20% of the tests are rejected for the reason that they break too close to the clamp.

This Standard is not equivalent to AS/NZS 1301.404s, in which the time to failure is used to describe the loading rate.

For the purposes of this Standard, the following definitions apply:

*Tensile strength:* The maximum tensile force per unit width that paper or paperboard will withstand before it breaks under the conditions defined in this Standard.

*Stretch:* The measured elongation at the moment of rupture when the paper or paperboard is strained as described in this Standard, expressed as a percentage of the initial length.

*Tensile energy absorption:* The total work done per unit of surface area of the test span in straining paper or paperboard to rupture as described in this Standard.

Similar Standards are:

SCAN-P38

TAPPI T494om 01

NOTES

# Tensile strength of paper and paperboard (constant rate of elongation method)

## 1 Scope

This standard describes a method for measuring the tensile strength of paper at constant rate of elongation. The tensile force applied to the test piece and its elongation are measured continuously during the test and the results are used to determine tensile energy absorption. Stretch at break may also be determined if required.

## 2 Normative references

The following documents are referred to in this Standard.

AS/NZS

1301.414s Conditioning of paper for testing

1301.415s Standard atmosphere for testing paper and board and procedure for monitoring the atmosphere

## 3 Apparatus

### 3.1 Tensile testing apparatus

Tensile testing apparatus designed to extend a test piece of given dimensions at an appropriate rate of elongation and to measure the tensile force and, if required, the elongation produced and/or the work done in stretching and breaking the test piece. The apparatus shall include:

- (a) Two clamps for holding a  $15.0 \pm 0.1$  mm wide test piece. The clamps shall be supported so that they are aligned when tension is applied and shall be so designed that the test piece cannot slip in the clamped area.

NOTE 1 — The clamps should preferably grip the test piece between a cylindrical and a flat surface or between two cylindrical surfaces with the line of contact normal to the direction of test. Other types of clamp may be used provided that no slipping of the test piece occurs within the faces of the clamp and the test piece is not damaged during testing.

The clamping lines shall remain parallel to within  $\pm 1^\circ$  and normal to the direction of tension to within  $\pm 1^\circ$  under load.

The distance between the clamping lines shall be adjustable to the test length required to within  $\pm 1$  mm.

- (b) A means of driving one or both clamps in a direction parallel to the long axis of the test piece at the required constant rate of separation.
- (c) A means of measuring the tensile force to within  $\pm 1\%$  of the true force and, if required, the elongation to within  $\pm 0.1$  mm of the true elongation and the work done to within  $\pm 2\%$ .

### 3.2 Test piece cutter

Test piece cutter of guillotine-knife or die-cutter type, capable of cutting test pieces 15 mm wide with a tolerance of  $\pm 0.1$  mm and of the required length.

## 4 Preparation of test pieces

**4.1** Condition the sample in the standard atmosphere prescribed in AS/NZS 1301.415s according to the procedure prescribed in AS/NZS 1301.414s.