

Australian/New Zealand Standard™

Methods of test for pulp and paper

**Method 004s: Solubility of wood in
boiling water**



AS/NZS 1301.004s: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 29 June 2007 and on behalf of the Council of Standards New Zealand on 6 July 2007.

This Standard was published on 10 August 2007.

The following are represented on Committee PK-019:

Australian Institute of Packaging
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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Method 004s: Solubility of wood in boiling water

Originated in Australia as AS P1.P4m—1961.
Previous edition AS/NZS 1301.004s:1998.
Second edition 2007.

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Jointly published by Standards Australia, GPO Box 476, Sydney, NSW 2001 and Standards New Zealand, Private Bag 2439, Wellington 6020

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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/NZS 1301.004s:1998.

Introduction

This determination is a measure of the materials in wood (or pulp) which are soluble in boiling water. They may include tannins, kinos, colouring matter, sugars, free acids and free mineral matter. The values obtained are arbitrary because departures from the conditions laid down can cause more or less material to be extracted. Since hot water has a limited hydrolytic effect on wood, which increases with time of extraction, some water soluble hydrolysis products are extracted along with the soluble material initially present.

Similar standards are ASTM D 110, TAPPI T207om and CPPA G.4.

Solubility of wood in boiling water

1 Scope

This standard sets out a method to be used to determine the proportion of material in wood which is soluble in boiling water.

2 Normative references

The following document is referred to in this standard.

AS/NZS

1301.002s Preparation of wood samples for chemical analysis

3 Principle

A prepared sample of air-dry wood is boiled in water for one hour. The oven-dry mass of dissolved material is calculated by difference and expressed as a percentage of the oven-dry mass of the sample.

4 Apparatus

4.1 Hotplate with regulator, for boiling the water steadily throughout the determination.

4.2 Alundum crucibles, porosity R.A. 98; or sintered glass crucibles, porosity 2.

5 Preparation of sample

Prepare the sample for testing in accordance with AS/NZS 1301.002s.

6 Procedure

The solubility of wood in boiling water shall be determined in duplicate using the following procedure for each test sample:

- (a) Determine the moisture content of the air-dry wood by drying duplicate weighed test specimens in an oven at $105 \pm 2^\circ\text{C}$ until constant weight is attained.
- (b) Weigh to the nearest 0.001 g a quantity of the air-dry wood equivalent to 2.0 ± 0.1 g of oven-dry material and place it in a 1 litre conical flask.
- (c) Measure 300 mL of boiling distilled water in a graduated measuring cylinder and add it to the flask. Fit the flask with a reflux condenser, heat the contents to boiling point and boil steadily under reflux for one hour.
- (d) Dry a crucible in the oven at $105 \pm 2^\circ\text{C}$ for 30 min, cool in a desiccator and weigh the crucible.
- (e) Decant the water extract through the crucible and transfer the wood to the crucible with the aid of near-boiling water from a wash bottle. Wash the wood on the crucible with near-boiling distilled water using a total volume of 500 mL. Dry the crucible and contents in the oven, cool in a desiccator and weigh. Repeat the heating and weighing operations until the weight is constant within 2 mg.

Repeat the procedure for the second test sample.

7 Expression of results

Calculate the content of material soluble in boiling water as a percentage of the oven-dry mass of wood. The duplicate results should agree to within 0.5%.