Australian/New Zealand Standard™

Methods of test for pulp and paper

Method 001s: Basic density of pulpwood

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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 25 June 2002 and on behalf of the Council of Standards New Zealand on 20 June 2002. It was published on 18 July 2002.

The following are represented on Committee PK-019:

Appita Inc.
AusInfo
CSIRO Forestry and Forest Products
Forest Research (New Zealand)
National Association of Forest Industries
New Zealand Pulp and Paper Industry Association
Printing Industries Association of Australia
Pulp and Paper Manufacturers Federation of Australia

Additional interests participating in the preparation of this Standard:

Paper manufacturers
Pulp manufacturers
Research interests
Manufacturers of paper testing instruments
Suppliers of paper testing instruments

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This Standard was issued in draft form for comment as DR 98352.

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Originated in Australia as AS 1301.P1s—1979.
Originated in New Zealand as NZS/AS 1301.P1s—1979.
Jointly revised and redesignated as AS/NZS 1301.001s:2002.

Jointly published by Standards Australia International Ltd, GPO Box 5420, Sydney, NSW 2001 and Standards New Zealand, Private Bag 2439, Wellington 6020

ISBN 0 7337 4721 3

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Foreword

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

This edition cancels and replaces AS 1301.P1s—1979 and NZS/AS 1301.P1s—1979. The title has been changed from ‘Basic density of wood chips’ to ‘Basic density of pulpwood’.

This revision includes a method for measuring basic density of disks and, for the measurement of basic density of wood chips, it includes a two hour boiling method for soaking the chips as an alternative to the seven day soaking method.

Annex A is for information only.

Introduction

Density is the ratio of the mass of a nominated quantity of a substance to the volume of the same quantity and thus is expressed as mass per unit volume. In the SI system, the preferred unit for wood density is kg/m^3. Because wood substance shrinks or swells with changes in moisture content, it is necessary to specify the moisture conditions used during the measurement of volume. Basic density is usually defined as moisture-free mass per unit green volume. Because it is not always possible to restore the volume of dried or partially dried wood chips to their original green value, basic density as measured according to this standard is more accurately defined as moisture-free mass per unit soaked volume[1,2]. The two soaking techniques stipulated for chips can be assumed to give sufficiently reproducible results for hardwood chips. In the case of softwoods, the presence of resin may hinder water uptake, but a more suitable method is not currently available. The method for measuring basic density of wood disks can be assumed to give sufficiently reproducible results for green hardwood disks.

Similar standards are TAPPI T258om-94 and CPPA A.8P-90.

Basic density of pulpwood

1 Scope

This standard prescribes the procedures to be used for determining basic density of pulpwood either in chip or disk form.

2 Normative references

The following standard contains provisions which, through reference in this text, constitute provisions of AS/NZS 1301.001s. At the time of publication, the edition indicated was valid. All standards are subject to revisions, and parties to agreements based on AS/NZS 1301.001s are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below.

AS/NZS 1301.013rp—1999, Sampling of woodchips for testing

3 Principle

The oven dry mass and soaked volume of wood chips or wood disks are determined. Two alternative methods of soaking wood chips are provided and two alternative methods of determining the soaked volume of both chips and disks are provided. The basic density is calculated from the oven dry mass and soaked volume.

TEST PROCEDURE FOR CHIPS

4 Apparatus

4.1 Balance, capable of weighing the samples to within ±0.1 g.

NOTE 1 — For the 'on balance' procedure a top loading balance with a taring facility is the most convenient. A balance with a taring facility and fitted with a suspension hook is suitable for the 'off balance' method.

4.2 A ventilated drying oven, in which an air temperature of 105 ±2°C is maintained.

4.3 Chip basket, made of bronze or stainless steel mesh with 1 mm to 4 mm apertures. The basket shall have a hinged lid with a clasp, or other suitable means of closing and fixing, a means of suspension and shall provide no points where air may become entrapped. The basket shall be sufficiently large to comfortably hold the volume of chips taken, allowing for swelling of the chips. A 1.3 L chip basket has been found to be suitable for a one litre chip sample.

4.4 A laboratory screen, with openings between 5 mm and 12 mm.

4.5 Towels, clean, dry, absorbent, of either cotton or linen and lint free. The absorbency of the towels is important to the reproducibility of the test. New towels shall be laundered at least six times before they are used for this determination, as the absorbency of new towels tends to be low. Other drying techniques, for example, the use of blotting paper or a centrifuge, are not suitable and do not meet the requirements of this standard.

4.6 Container, for holding the water in which the chips are submerged. The container shall be sufficiently large to comfortably hold the submerged chips. A 10 litre beaker or bucket has been found to be suitable in most situations.

4.7 Auxiliary apparatus, beakers, stands, clamps.

5 Test specimens

5.1 Collect a representative sample of wood chips according to AS/NZS 1301.013rp.