AS/NZS 1301.445s:2006

Australian/New Zealand Standard™

Methods of test for pulp and paper

Method 445s: Hardness of corrugated board

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 3 February 2006 and on behalf of the Council of Standards New Zealand on 17 February 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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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 1301.445s—1989.

The term ‘informative’ has been used in this Standard to define the application of the annex to which it applies. An ‘informative’ annex is only for information and guidance.

Introduction

Corrugated board can be damaged by flat crushing loads when passing between rollers or belts during the container-making process, and the flat crush test is generally regarded as indicating the extent of this damage. However, it can often be observed that processing causes board to lose thickness and to feel softer, although the flat crush resistance is not reduced.

In flat crush testing the load deflection curve shows an initial straight line portion, followed by several distinct points. Examination of load deflection curves of a wide range of 'A', 'B' and 'C' flute boards has shown that the first yield point occurs within the first 250 μm deflection[1]. This is used as a basis for a simplified test in which the maximum load applied at this yield point, which occurs at or before 250 μm deflection, is measured. This measure is termed hardness.

This test is usually performed at the same time as the flat crust test (AS/NZS 1301.429s).

Contents

Hardness of corrugated board

1 Scope

This Standard prescribes the procedure to measure the hardness of corrugated board.

2 Normative references

The following documents are referred to in this Standard.

AS
1301.414m Conditioning of paper for testing

AS/NZS
1301.415s Standard atmosphere for testing paper and board and procedure for monitoring the atmosphere
1301.429s Flat crush resistance of corrugated board
1301.438s Bursting strength of board
1301.449s Description of crush testing equipment

3 Apparatus

3.1 Motor-driven crush testing machine

As described in AS/NZS 1301.449s.

3.2 Test piece cutter

As described in AS/NZS 1301.429s.

3.3 Test piece holder

As described in AS/NZS 1301.429s, modified to include a device to indicate when the test piece has decreased in thickness by 250 μm. Such a device and its mode of use are described in the Bibliography [1].

4 Preparation of test pieces

4.1 Condition the sample in accordance with AS 1301.414m in the standard atmosphere prescribed in AS/NZS 1301.415s.

4.2 From the sample, cut at least 10 test pieces which are free of flaws or abnormalities which may affect the test result, provided that such defects are not typical of the board under test. The test piece shall have an area of 50.0 ±0.1 cm^2 corresponding to a diameter of 79.8 ±0.1 mm.

NOTE 1 — AS/NZS 1301.429s allows the test piece area to be reduced to 30 ±0.01 cm^2 if the crush value is above the upper limit of the working range of the instrument. In such cases the lesser area may also be used for the hardness test. If this is done, the preload is 4.5 ±1.5 N (deflection of 0.075 ±0.025 mm), and the factors to be used in 5.5 and 5.6 are 100 instead of 60 and 0.33 instead of 0.2 respectively.

Do not include in any test piece any part of the board which is within 25 mm of a score line or cut edge. If the board sample is printed and comparative values are required, cut 10 test pieces from areas free of and at least 25 mm from any printed area, and 10 further test pieces directly from printed areas. If the only printing on the sample is the manufacturer's seal, the test pieces shall be taken only from the unprinted area.