AS/NZS 1301.458:2020

Australian/New Zealand Standard™

Methods of test for pulp and paper

Method 458: In-plane glue bond strength of wetted corrugated fibreboard

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AS/NZS 1301.458:2020

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The following are represented on Committee PK-019:

Appita
Monash University
New Zealand Paper Forum
Scion

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Second edition 2004.
Revised and redesignated as AS/NZS 1301.458:2020.

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 1301.458rp:2004, *Methods of test for pulp and paper, Method 458rp: Glue bond strength of wetted corrugated fibreboard*.

This Standard forms part of the AS/NZS 1301 series. A list of all parts in this series can be found in the Standards Australia online catalogue.

The objective of this Standard is to describe a method of determining the in-plane strength of the glue bonds of wetted corrugated fibreboard.

There are a number of other Standards, including ISO 3038, which describe different methods for determination of this property but, at publication of this Standard, none apply the stress in the direction in which it occurs when containers fail in service. In service, the failure-causing stress is in the plane of the board in a direction parallel to the flutes. This Standard applies the stress in that direction. ISO 3038 applies the stress in the plane of the board, but in a direction at right angles to the flutes. It measures the time taken for water to penetrate the glue line rather than the stress required to cause failure of a partially wet glue line, and it takes a substantial time to obtain a result.

The terms "normative" and "informative" are used in Standards to define the application of the appendices to which they apply. A "normative" appendix is an integral part of a Standard, whereas an "informative" appendix or annex is only for information and guidance.

Contents

Introduction

Failure of the glue bonds between the liners and corrugating medium in corrugated fibreboard is a major factor in the collapse of corrugated containers under wet conditions. When board is expected to be used in wet or humid conditions, a water-resistant adhesive is normally used to overcome this problem.

In this Test Method, test pieces are immersed in water at a controlled elevated temperature for a predetermined time. A progressively increasing load is then applied to the selected glue lines until failure occurs. The direction of application of load is parallel to the flutes and in the plane of the board. The force at failure is measured and expressed in N/m.

Different glues cure at different rates, depending on their formulation. While the maximum wet bond strengths of two different glue formulae may be similar, the rates at which their strengths develop may be quite different.

Australian/New Zealand Standard

Methods of test for pulp and paper

Method 458: In-plane glue bond strength of wetted corrugated fibreboard

1 Scope

This Standard describes a method of determining the in-plane strength of the glue bonds of wetted corrugated fibreboard.

The strength of the glue bonds of wet board is determined by applying a progressively increasing load to the selected glue lines until failure occurs; the direction of application being parallel to the glue lines and in the plane of the board.

It applies-to all types of corrugated fibreboards, including single-, double-, and triple-wall boards, in which the glue has reached a condition of maximum cure.

2 Normative references

The following document is referred to in the text in such a way that some or all of its content constitutes requirements of this document.

AS/NZS 1301.444*, Methods of test for pulp and paper, Method 444: Determination of edgewise crush resistance (unwaxed edge method)*

3 Terms and definitions

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

3.1
maximum cure
condition after which further ageing at room temperature produces no further increase in wet strength

3.2
may
indicates the existence of an option

3.3
sample
one or more units of product drawn from a batch or lot, selected at random without regard to quality

3.4
shall
indicates that a statement is mandatory

3.5
should
indicates a recommendation

4 Apparatus

The following apparatus is required:

(a) *Tensile testing machine and attachment*, A testing machine which applies a progressively increasing tensile load at a rate of 10.0 ± 0.5 N/min and is calibrated in accordance with the manufacturer's specifications to ensure that it indicates the maximum load at failure to within 0.01 N. The machine is fitted with a special clamping device which is described in