

Australian/New Zealand Standard™

Methods of test for pulp and paper

**Method 402rp: Statistical monitoring of
test systems**



AS/NZS 1301.402rp:2005

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CSIRO Forestry and Forest Products
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New Zealand Forest Research Institute

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Method 402rp: Statistical monitoring of test systems

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Preface

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/NZS 1301.402rp:1997.

This standard clarifies the objectives and the procedures for monitoring and controlling either a single test system or two or more test systems which are to be maintained in agreement with each other.

Annex A forms an integral part of this Standard.

Introduction

The objective in standardizing a test method is to define the apparatus and procedural variables sufficiently well to ensure that different laboratories in different locations can achieve and maintain adequately reproducible results for a particular test. It is important to recognize that, if a laboratory performs the test strictly in accordance with the standard test method, then its result is as valid as that achieved by any other laboratory which also tests strictly in accordance with the standard method. If, under these circumstances, the agreement between laboratories is not satisfactory for the technical or commercial purposes for which the test is applied, then the standard method does not adequately define the conditions of the test and needs to be revised.

Once the adequacy of a standard test method is established, it is necessary for each laboratory, in order to produce reliable results, to ensure that all of the requirements of the Standard are being satisfied. For a laboratory to be confident of its results, it is desirable to have some convenient performance check on whether the laboratory continues to achieve results that are sufficiently accurate.

This standard describes a procedure for monitoring the performance of a test system. The procedure described for a single system provides a measure of the constancy of the system over time but gives less of an indication of the accuracy of the system. The procedure described for multi-system monitoring provides a measure of both constancy and accuracy, the effectiveness of the latter depending on how close the assigned value is to the true value. However, neither procedure actually determines directly whether the test is being done strictly in accordance with the standard because, even if the test results appear satisfactory, there may be some consistent departure from the standard, or several departures which fortuitously compensate each other.

If the results of the testing are not satisfactory, it is necessary to ascertain and correct the error. The monitoring procedure cannot be regarded as a calibration procedure and the adjustment of any test variable within the permitted range of tolerance is prohibited if that adjustment is done with the objective of changing the test level to the desired level. Normally the procedures either verify the performance of the test system on a particular sample, providing confidence for the testing of similar samples, or they indicate the need for equipment maintenance, operator training or a change to the standard.

There is no corresponding ISO Standard.

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Statistical monitoring of test systems

1 Scope

The monitoring procedures described in this standard are applicable to all paper and board test systems for tests where a stable reference material is available. They shall not be used as a replacement for calibration of equipment, although the frequency of calibration may be reduced if the monitoring procedures in this Standard indicate the system is stable.

The procedures described are specific to paper and board testing but could be applicable to other testing where the reference material is not paper or board.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

AS/NZS

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

3 Definitions

For the purpose of this Standard the definitions below apply.

3.1 Accuracy

Closeness of agreement between the test result obtained by a particular test system combination of one operator, one apparatus and one laboratory) and the true value of the sample.

3.2 Replicate test

A single performance of the procedure of the test on a single test piece.

3.3 True value

The correct value of the test result which would be obtained if every source of error and variability could be eliminated. In most cases the true value can never be known but can be estimated with varying degrees of accuracy.

3.4 Test system

The combination of one operator, one apparatus and one test environment which produces the test result.

3.5 Test result

The mean of the results of the required number of replicate tests performed in accordance with the Standard.

3.6 Repeatability

The degree of agreement between two test results obtained on a particular sample by a particular test system at a particular time.

3.7 Reproducibility

The degree of agreement between test results obtained by two different test systems on the same sample.