INTERNATIONAL STANDARD

ISO 4094

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Paper, board and pulps — International calibration of testing apparatus — Nomination and acceptance of standardizing and authorized laboratories

Papiers, cartons et pâtes — Étalonnage international des appareils d'essai — Désignation et agrément des laboratoires de référence et des laboratoires agréés

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 4094 was prepared by Technical Committee ISO/TC 6, *Paper, board and pulps*.

Annex A of this International Standard is for information only.

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Introduction

The object of standardization of testing methods is to create the means by which comparable results can be obtained on different occasions and in different laboratories to control the processes that determine the acceptability of a product (see ISO 9004:1987, *Quality management and quality system elements — Guidelines*, clause 13).

Most testing methods are linked with the existence of some kind of reference standard to which the numerical results are to be related. In many cases the comparison is made by means of readily available instruments of appropriate accuracy, for example, a balance with certified weights, a chronometer, a calibrated length-measuring device such as a micrometer, etc.

However, in certain instances, the relation to the reference standard may not be obvious, or there may be practical problems in measuring particular properties; the test method must therefore include additional instructions for ensuring reasonable accuracy of the results. This may be accomplished with the aid of transfer standards, when the results are related either to certain properties of a unique reference standard, or to results obtained at specified laboratories entrusted with the performance of certain delicate measurements. Standardizing and authorized laboratories act as links in supplying the transfer standards required.

Paper, board and pulps — International calibration of testing apparatus — Nomination and acceptance of standardizing and authorized laboratories

1 Scope

This International Standard provides the rules for the nomination and acceptance of standardizing and authorized laboratories with the aim of establishing and maintaining the reference standards and distributing the transfer standards required to achieve interlaboratory agreement in the results of a test method specified in an International Standard for paper, board or pulp. It provides guidelines for the establishment of criteria for the initial and continued acceptance of nominated laboratories.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 4046:1978, *Paper, board, pulp and related terms — Vocabulary*.

3 Definitions

For the purposes of this International Standard, the following definitions apply (see also table 1 and annex A).

3.1 standardizing laboratory: A laboratory appointed by Technical Committee ISO/TC 6 to maintain in safe custody [3.3 a), b) or c)] or otherwise realize [3.3 d)] an ISO reference standard of level 1 (symbol IR1), to determine by comparison with it the values of ISO reference standards of level 2 (symbol IR2), to prepare the IR2 standards, and to supply these IR2 transfer standards to authorized laboratories, where required by an ISO International Standard under the jurisdiction of ISO/TC 6.

3.2 authorized laboratory: A laboratory appointed by Technical Committee ISO/TC 6 to provide ISO reference standards of level 3 (symbol IR3), to determine their values by comparison with ISO level 2 standards and supply these IR3 transfer standards to testing laboratories, in accordance with an ISO International Standard under the jurisdiction of ISO/TC 6.

3.3 ISO reference standard of level 1 (IR1): An ultimate and permanent reference standard, unique or collective, used for standardization of tests.

NOTE 1 In practice, this may be, for example

a) a material standard supplementing metrological standards for specific industrial needs;

b) a product of high quality adopted as a reference standard with respect to certain of its properties;

c) a complex apparatus (or piece of equipment) or a product necessary for the execution of tests and maintained as a permanent reference standard;

d) an ideal standard, such as the perfect reflecting diffuser (see ISO 4046:1978, definition 7.26).

3.4 ISO reference standard of level 2 (IR2): A transfer standard for the evaluation of level 3 (IR3) standards or for the calibration of instruments, consisting of a material or object evaluated against an ISO reference standard of level 1 by a standardizing laboratory, as laid down in the agreement between Technical Committee ISO/TC 6 and that laboratory.

3.5 ISO reference standard of level 3 (IR3): A transfer standard consisting of a material or an object evaluated against an ISO reference standard of level 2 by an authorized laboratory, as specified in

the relevant International Standard, and used by a testing laboratory for the calibration of instruments.

3.6 competent technical group: The ISO/TC 6 working group or subcommittee having responsibility for the ISO International Standard requiring the use of ISO reference standards.

Table 1

Laboratory	Activity	Standard issued
Standardizing	Maintains IR1 (level 1 standard)	IR2 (level 2 standard)
	Evaluates IR2 against IR1	
Authorized	Evaluates IR3 against IR2	IR3 (level 3 standard)
Testing	Calibrates test instrumentation with IR3	

4 Guidelines for preparation of specific technical criteria

The members of the competent technical group have the expertise to draft the specific criteria with which the qualifications of a nominated laboratory may be assessed. The specific technical criteria for judging the standardizing and authorized laboratories should be included as annexes to any International Standard that specifies the use of ISO reference standards.

The technical criteria shall include requirements as to instrumentation (nature, calibration, maintenance) and procedure to be used, with as much flexibility as possible, and yet allow achievement of the desirable degree of international standardization.

The technical criteria shall include requirements as to the nature of the ISO reference standards to be made available by the standardizing and authorized laboratories, the traceability of these standards to the next higher level of standardization, and the procedures for, and frequency of, intercomparisons among the standardizing and authorized laboratories. The level of agreement to be achieved in the inerlaboratory checks shall also be specified. Failure to reach the required level of agreement among the participating laboratories shall be reviewed and resolved.

5 General criteria for acceptance

In order that a laboratory may be eligible for acceptance as a standardizing or authorized laboratory, the following criteria shall be met.

5.1 The laboratory shall be nominated by its national member body.

5.2 The laboratory shall provide a letter stating

a) that in its opinion it can and will continue to meet the requirements for a standardizing or authorized laboratory as specified in this International Standard and in the International Standard for the relevant test method;

b) that it will maintain instrumentation in compliance with the relevant International Standard;

c) that in all its activities concerning the preparation of ISO reference standards it will follow the instructions in the relevant International Standard;

d) for an authorized laboratory, that it will calibrate against standards of level 2 issued by a standardizing laboratory.

The letter shall include an agreement, for a standardizing laboratory, to calibrate ISO reference standards of level 2 at a reasonable price to any authorized laboratory requesting the level 2 standard, and, for an authorized laboratory, to calibrate reference standards of level 3, at a reasonable price to any laboratory in any country requesting the level 3 standard. The letter shall also include an agreement covering comparative measurements (see 8.2), biannual reports (see 8.3), and change in procedure (see 8.4).

5.3 The laboratory shall provide documents describing in detail the instrumentation and procedures to be followed both in the measurement and checking of assigned values for, and in the distribution of, the ISO reference standards of levels 2 or 3, as applicable. This information shall include a description of the instrumentation to be used for the measurements (manufacturer, model and serial numbers, special features and modifications, drawings if own make), applicable publications describing the procedure, descriptions of the materials or objects to be used as level 2 or 3 standards, and other information as specified in the relevant International Standard.

5.4 The laboratory shall in fact meet the detailed criteria specified in the relevant International Standard, and shall satisfy the technical group chairman that the laboratory has the equipment and technical competence necessary to establish and maintain the required services, and shall cooperate in this determination by providing additional information, if required. In the case of dispute, the vote of the competent technical group should be considered.

5.5 An applicant laboratory shall participate in at least one interlaboratory check conducted by the competent technical group before being accepted, provided that a comparative measurement (see 8.2) can be conducted within 6 months after the application is submitted. The laboratory's performance in the check shall not in itself be the basis for accepting or rejecting its application, but may be used with other information in examining doubtful cases (see 7.3.1).

6 Nomination of standardizing and authorized laboratories

Before ISO/TC 6 approves a draft International Standard that includes instructions referring to a reference standard of level 2, the committee shall seek a nomination (uniquely available level 1 standard) or nominations for standardizing laboratories. A standardizing laboratory will be nominated by its national member body with supporting documentation as to the qualifications of the laboratory (see 5.2 and 5.3). The nomination and supporting documentation shall be submitted to the secretariat of ISO/TC 6.

Authorized laboratories will be nominated in like manner by their national member bodies.

NOTE 2 It is anticipated that very few laboratories will be willing to qualify as standardizing laboratories because of the expense of the delicate and sophisticated apparatus and supporting equipment required to maintain or realize a level 1 reference standard. Also, it is anticipated that with the establishment of authorized laboratories to serve several countries (see 7.4), the number of authorized laboratories will be kept to an adequate minimum.

7 Procedure for acceptance of nominations

7.1 The ISO/TC 6 secretariat shall send copies of all nominations and supporting documents to the chairman of the competent technical group responsible for the ISO International Standard.

7.2 The technical group chairman shall review the supporting documents. If all required information has been provided and the nominated laboratory appears to meet all of the specified criteria, the chairman shall so notify the ISO/TC 6 secretariat who in turn shall notify all P- and O-members and the ISO Central Secretariat as to the name and address of the laboratory and its provisional acceptance as a standardizing or authorized laboratory for the designated ISO International Standard. The competent technical group chairman in a report to the next meeting of ISO/TC 6 shall present the evidence supporting his provisional acceptance of the laboratory and the laboratory's results in any international intercomparisons, and request confirmation of the laboratory's acceptance by voice vote of the member bodies present at the meeting.

7.3 If not all of the required information has been provided or if the nominated laboratory appears not to meet all of the specified criteria, the technical group chairman shall attempt to obtain the required information by direct communication with the laboratory (with copy of correspondence to the laboratory's member body). The chairman shall attempt to help the laboratory to qualify by providing references to the literature, clarifications, suggestions, and other information.

7.3.1 If, in the opinion of the technical group chairman, the intent (but not the letter) of the criteria has been met, he may seek an advisory opinion by letter from members of his technical group. If they concur with his opinion, he may provisionally accept the nomination and so notify the ISO/TC 6 secretariat, thus permitting the laboratory to function for the time being as a standardizing or authorized laboratory until compliance with the criteria is achieved (9.1).

7.3.2 If, after reasonable help from the chairman, the laboratory still does not comply with the acceptance criteria or with the intent of the criteria, the chairman should request the member body to withdraw the nomination until the laboratory can comply. The member body may accept the request and so notify the technical group chairman and the ISO/TC 6 secretariat, or the member body may request a review by the technical group. In the latter case, the chairman shall summarize the situation, including his efforts to resolve the differences, and shall circulate the summary and any response from the member body to members of his technical group. He shall also ensure that an opportunity is given to the nominated laboratory or designated representative of the member body to present its case at the next meeting of the technical group.

If the technical group members present at the meeting agree that the nominee meets the criteria or the intent of the criteria and therefore vote to accept the nomination, then the chairman shall notify the ISO/TC 6 secretariat. If it is agreed that the nomination should be rejected, the member body shall again be given the opportunity to withdraw the nomination. If the nomination is not withdrawn, the chairman shall summarize his efforts and those of his group to resolve the differences and shall attach this summary to his report to the ISO/TC 6 secretariat that the nomination has been rejected. The secretariat shall determine whether or not all procedural requirements of this International Standard have been followed, and, if so, shall notify the member body that the nomination has been rejected. The member body may appeal against the decision to the chairman of ISO/TC 6 who, at his discretion, may call for an advisory letter ballot of

member bodies or a discussion and review at a meeting of the subcommittee or main committee, or he may uphold the action of the technical group. Further appeals should conform to the procedure given in the ISO/IEC Directives — Part 1:1989, *Procedures for the technical work*, clause 4.

NOTE 3 If a nomination has been accepted because the intent (but not the letter) of the criteria has been met, the technical group shall initiate a revision of the criteria to specifically encompass this broader interpretation.

7.3.3 The notice to be sent by the competent technical group chairman to the ISO/TC 6 secretariat as specified in 7.3.1 and 7.3.2 shall also be included in the technical group report to its parent subcommittee or committee.

7.4 At most, only one standardizing and one authorized laboratory for a specific standard should be nominated by a member body from its country. An accepted laboratory in another country may be requested by any member body to serve for its country too; for example, once a laboratory has been accepted, it may serve as a regional laboratory for several countries. However, an authorized laboratory shall be free to utilize any standardizing laboratory, and testing laboratories are not to be explicitly excluded from using authorized laboratories in other countries, if national policy permits.

8 General criteria for continued acceptance

In order that a laboratory may remain in good standing as a standardizing or authorized laboratory, the following criteria shall be met.

8.1 Notice shall not have been received by the ISO/TC 6 secretariat from the laboratory's member body or from the laboratory that it may no longer serve (see 9.2).

8.2 The laboratory shall participate regularly (and free of charge) in comparative measurements with other standardizing or authorized laboratories and shall achieve an agreement with other laboratories within the precision specified in the relevant International Standard.

NOTE 4 The frequency of the comparative measurements shall be as specified in the relevant International Standard.

8.3 An authorized laboratory shall provide a report to the ISO/TC 6 secretariat by 1 February of each even-numbered year, which includes the dates and results of evaluations of all level 2 (IR2) standards processed since the last report, and the name of the standardizing laboratory which provided the calibrations.

8.4 The laboratory shall notify the ISO/TC 6 secretariat whenever it changes its procedures or instrumentation, including changes necessitated by the revision of this International Standard or the relevant International Standard.

9 Procedure for continued acceptance

9.1 No automatic time-limit shall be placed on the continued acceptance of a laboratory as a standardizing or authorized laboratory. To maintain acceptance, a laboratory shall continue to meet the criteria for continued acceptance by participating in interlaboratory comparisons as specified. In addition, an authorized laboratory shall provide to the competent technical group chairman by 1 February of each even-numbered year the reports specified.

If a laboratory fails to provide the necessary reports or to participate in interlaboratory comparisons, the technical group chairman shall attempt to determine whether the cause is temporary or likely to be permanent. In the latter case, for example, failure to participate in two successive interlaboratory comparisons, acceptance shall be revoked following the procedure for rejection of a nomination as detailed in 7.3.2 and 7.3.3.

If in the interchange of standards a laboratory persistently obtains apparently discrepant results, the methods of all of the laboratories involved shall be reviewed to determine the cause of the difference and to arrive at a resolution thereof. If it is clearly established that the discrepant laboratory is following an erroneous procedure, and that the discrepancy is not likely to be resolved within a reasonable time, the acceptance shall be revoked in accordance with 7.3.2 and 7.3.3.

9.2 A standardizing or authorized laboratory shall immediately report to the ISO/TC 6 secretariat when it has reason to believe that it is no longer capable of providing, or willing to provide, the services for which it was accepted. The secretariat shall notify all P- and O-members that the laboratory has voluntarily withdrawn.

9.3 When an International Standard is submitted for a 5-year periodical review, it shall be accompanied by a report from the ISO/TC 6 secretariat listing the currently approved standardizing and authorized laboratories, and a report from the competent technical group on the latest interlaboratory comparisons and any problems encountered.

10 List of standardizing and authorized laboratories

A list of names and addresses of standardizing and authorized laboratories and the applicable ISO ref-

erence standards shall be maintained by the ISO/TC 6 secretariat. If the ultimate standard (ISO reference standard of level 1) is uniquely available in only one standardizing laboratory, the name and address of that laboratory shall be listed in the relevant International Standard. Otherwise, the relevant International Standard shall simply indicate that a list of standardizing and authorized laboratories is available from the ISO Central Secretariat, the ISO/TC 6 secretariat, and the national member bodies.

Annex A
(informative)

Use of ISO reference standards (IR)