INTERNATIONAL STANDARD

ISO 4094

Second edition
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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

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

This second edition cancels and replaces the first edition (ISO 4094:1991). It follows the scheme established in the first edition, with many changes made largely for the sake of clarity. Major changes include the following:

a) in the Scope, it is indicated that this standard is for use specifically by ISO/TC 6 or one of its subcommittees;

b) in Clause 5, it is made clear that a laboratory may function as a standardizing laboratory, an authorized laboratory, or both;

c) in 7.1.2, it is stipulated that costs associated with the qualification procedure shall be borne by the applicant laboratory;

d) the need for strict confidentiality in assessing nominations is emphasized in 7.1.1, and the identification of a deputy convenor is suggested for those situations in which the convenor cannot be neutral;

e) in 8.3, it is required that the convenor report, every two years to the ISO/TC 6 Secretariat, the results of interlaboratory meetings and comparisons held during that period;

f) a new Clause 10 has been added, specifically dealing with the revocation of appointments.

Introduction

The objective 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. Most testing methods for paper, board and pulps 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 laboratories 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 rules for the nomination and appointment of standardizing and authorized laboratories under the jurisdiction of ISO/TC 6, or one of its subcommittees, 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 appointment and continued acceptance of nominated laboratories.

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.

ISO/IEC Directives Part 1:2001, *Procedures for the technical work*

ISO 17025, *General requirements for the competence of testing and calibration laboratories*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply (see also Table 1 and Annex A).

3.1
standardizing laboratory
laboratory appointed by ISO/TC 6 to maintain in safe custody, or otherwise realize an ISO reference standard of level 1 (notation IR1), to determine by comparison with it the values of ISO reference standards of level 2 (notation IR2), to prepare the IR2 standards, and to supply these IR2 transfer standards to authorized laboratories, where required by an International Standard under the jurisdiction of ISO/TC 6

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

3.3
testing laboratory
laboratory that performs tests

3.4
ISO reference standard of level 1
IR1
ultimate and permanent reference standard, unique or collective, used for standardization of tests

NOTE 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.

3.5
ISO reference standard of level 2
IR2
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 specified in the relevant International Standard

3.6
ISO reference standard of level 3
IR3
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

3.7
competent technical group
ISO/TC 6 working group or subcommittee having responsibility for the International Standard requiring the use of ISO reference standards

3.8
convenor
person who convenes the competent technical group responsible for the International Standard requiring the use of a reference standard

NOTE Normally, this is the convenor of the working group, but if there is no working group, then the appropriate technical committee or subcommittee chairman assumes the responsibilities of convenor.

Table 1 — Organization of laboratories (see Annex A)

Laboratory	Activity	Standard issued
Standardizing laboratory	Maintains IR1 (level 1 standard) Evaluates IR2 against IR1	Level 2 standard (IR2)
Authorized laboratory	Evaluates IR3 against IR2	Level 3 standard (IR3)
Testing laboratory	Calibrates test instrumentation with IR3	No ISO reference standard issued

4 Guidelines for preparation of specific technical criteria

The competent technical group shall have the expertise to draft the specific technical criteria against which the qualifications of a nominated laboratory may be assessed. The specific technical criteria for judging the merits of a nominated laboratory to act as a standardizing or authorized laboratory shall 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 the procedure to be used, with as much flexibility as possible, while still achieving the desired 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.

5 General criteria for appointment

In order that a laboratory may be eligible for appointment as a standardizing or authorized laboratory, or both, 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 and/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 an 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), biennial reports (see 8.3), and changes 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 competent technical group convenor 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.

5.5 The applicant laboratory (authorized or standardizing, as applicable) shall participate in at least one bilateral check with an equivalent laboratory conducted by the competent technical group before being accepted. 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 or any of its subcommittees approves a draft International Standard that includes instructions referring to a reference standard of level 2, the committee or subcommittee shall seek a nomination (uniquely available level 1 standard) or nominations for standardizing laboratories. A standardizing laboratory shall 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 shall be nominated in like manner by their national member bodies.

NOTE 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 initial appointment

7.1 Immediately upon receipt, the ISO/TC 6 Secretariat shall send copies of all nominations and supporting documents to the convenor of the competent technical group responsible for the International Standard.

7.1.1 At every stage of the procedure for appointment, the matter shall be held in strict confidence by the competent technical group convenor. The convenor shall respect and protect any and all proprietary technical information acquired during the qualification procedure. If the convenor cannot be neutral in these matters, then he or she should not participate directly in the procedure, but should appoint a deputy instead. This might be done if the convenor is a competitor, for example.

If the convenor does not possess the qualifications to make an adequate technical assessment of the applicant laboratory, he or she should appoint another person as technical assessor.

Any person acting as a deputy or as a technical assessor shall be appointed only if he or she is acceptable to the applicant laboratory. The deputy and technical assessor shall report their overall conclusions to the convenor, while themselves respecting and protecting any and all proprietary and technical information acquired during their assessment. The same person may act as deputy and as technical assessor.

7.1.2 Costs associated with the processing of the application shall, in principle, be borne by the applicant. The technical group convenor will normally claim reimbursement for expenses, particularly where these include the cost of travel by the convenor, the deputy or the technical assessor, if it becomes appropriate for someone to visit the applicant laboratory. Such costs will be agreed upon in advance between the convenor and the applicant laboratory and filed with ISO/TC 6. It is understood that such costs will be kept to a minimum.

7.2 The competent technical group convenor or deputy 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 convenor shall so notify the ISO/TC 6 Secretariat, who in turn shall notify all its participating (P) and observer (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 International Standard. The convenor or deputy, in a report at the next meeting of ISO/TC 6 (or the applicable subcommittee), shall present the evidence supporting the provisional acceptance of the laboratory and the laboratory's results in any international intercomparisons, and request confirmation of the laboratory's appointment by 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 competent technical group convenor or deputy shall attempt to obtain the required information by direct communication with the laboratory (with copies of correspondence to the laboratory's national member body). The convenor or deputy 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 competent technical group convenor or deputy, the intent (but not the letter) of the criteria has been met, the convenor may seek an advisory opinion by letter from members of the competent technical group. If they concur with this opinion, the convenor 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 (see 9.1).

7.3.2 If, after reasonable help from the convenor or deputy, the laboratory still does not comply with the appointment criteria or with the intent of the criteria, the convenor should ask the TC 6 Secretariat to request the national member body to withdraw the nomination until the laboratory can comply. The member body may accept the request and so notify the convenor and the ISO/TC 6 Secretariat, or the member body may request a review by the competent technical group. In the latter case, the convenor shall summarize the situation, including efforts to resolve the differences, and shall circulate the summary and any response from the member body to members of the competent technical group. The convenor 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 competent 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 convenor 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 convenor or deputy shall summarize his or her efforts and those of the competent technical group to resolve the differences and shall attach this summary to a 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 national member body may appeal against the decision to the chairman of ISO/TC 6 who 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 may uphold the action of the technical group. Further appeals should conform to the procedure given in the ISO/IEC Directives Part 1:2001, Clause 5.

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 convenor to the ISO/TC 6 Secretariat, as specified in 7.3.1 and 7.3.2, shall also be included in the report of the competent technical group to its parent subcommittee or committee.

7.3.4 Nominations shall be processed as expeditiously as possible. If a nominated laboratory feels that the process is proceeding at an unnecessarily slow pace, the matter should be brought to the attention of the ISO/TC 6 Chairman through the ISO/TC 6 Secretariat.

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. 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.

7.5 The members of the competent technical group should consider the desirability of requiring the appointed laboratory to seek accreditation in accordance with ISO 17025, to demonstrate competence by the laboratory in carrying out specific calibrations or tests.

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 In situations where there is more than one laboratory, each laboratory shall participate regularly (and free of charge) in comparative measurements with other standardizing or authorized laboratories and shall achieve satisfactory agreement with them. The convenor shall be responsible for ensuring that such interlaboratory comparisons are carried out with sufficient regularity.

8.3 Each standardizing and authorized laboratory shall provide a report to the ISO/TC 6 Secretariat (with a copy to the convenor of the competent technical group) by February 1 of each even-numbered year. The report shall provide a brief summary of the activity as a standardizing or authorized laboratory, and each authorized laboratory shall include 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.

The convenor shall review the submitted reports and subsequently send a summary and analysis of these reports to the secretary of TC 6 (and, if applicable, to the secretary of the relevant subcommittee). The convenor's report will also include information regarding the history and results of all interlaboratory meetings and intercomparisons held during the period. In case of reported problems, the convenor shall take measures to find solutions to the problems, including the possible revocation of acceptance (see 10.1).

8.4 The laboratory shall notify the ISO/TC 6 Secretariat and the convenor of the relevant competent technical group, whenever it changes its procedures or instrumentation, including changes necessitated by the revision of this International Standard or another relevant International Standard.

9 Procedure for continued acceptance

9.1 No 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 8.2. In addition, each standardizing and authorized laboratory shall provide the reports as specified in 8.3.

If a laboratory, after a suitable reminder, fails to provide the necessary reports or to participate in interlaboratory comparisons, the convenor 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, the appointment shall be revoked by the ISO/TC 6 Secretariat in accordance with the procedure detailed in Clause 10.

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 convenor shall contact the ISO/TC 6 Secretariat and shall request that the appointment be revoked in accordance with Clause 10.

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 or the applicable subcommittee listing the currently approved standardizing and authorized laboratories, and a report from the convenor of the competent technical group on the latest interlaboratory comparisons and any problems encountered.

9.4 Each standardizing and authorized laboratory immediately shall inform the Secretariat of ISO/TC 6 of any changes in the personnel responsible for the technical management of the program. Continued acceptance of a laboratory shall be dependent upon its ability to demonstrate no loss in required technical competence as a result of such changes.

10 Revocation of an appointment

10.1 If, after reasonable help from the convenor or deputy as indicated in 8.3, the performance of the standardizing or authorized laboratory is still not satisfactory, the convenor shall summarize the situation, including efforts to resolve the differences, and shall ask the ISO/TC 6 Secretariat to revoke the appointment. The ISO/TC 6 Secretariat shall inform the laboratory concerned, and its member body, that it is proposed that the appointment be revoked and shall invite the laboratory concerned to respond, through its member body, within 30 days, with a full proposal indicating how it is anticipated that the performance of the laboratory can be improved.

While respecting the rights of the standardizing or authorized laboratory concerned, the ISO/TC 6 Secretariat should be aware of its responsibility to act without delay, to ensure that industrial laboratories are provided with reference standards of high quality.

10.2 The national member body may

a) accept the revocation and so notify the convenor and the ISO/TC 6 Secretariat, or

b) provide the requested proposal, or

c) request a review by the competent technical group.

10.2.1 In the first case, the ISO/TC 6 secretariat shall proceed according to 10.3.

10.2.2 In the second case, the convenor shall make renewed efforts (see 8.3) to ensure that the proposal is implemented and that a satisfactory result is achieved.

10.2.3 In the third case, the convenor shall summarize the situation, including efforts to resolve the problem, and shall circulate the summary and any response from the national member body or the laboratory concerned to members of the competent technical group. The convenor shall also ensure that an opportunity is given to the laboratory concerned, or a designated representative of the member body, to present its case at the next meeting of the technical group.

If the competent technical group members present at the meeting consider that the laboratory should continue to serve and vote to approve continued acceptance, the convenor shall notify the ISO/TC 6 Secretariat of this decision.

If it is agreed that the acceptance should be revoked, the member body shall be given the opportunity to withdraw its support for the laboratory.

If the nomination is not withdrawn by the member body, the convenor or deputy shall summarize his or her efforts and those of the competent technical group to resolve the differences, and shall attach this summary to a report to the ISO/TC 6 Secretariat recommending that the appointment be revoked. The Secretariat shall determine whether or not all procedural requirements of this International Standard have been followed, and, if so, shall notify the national member body and the laboratory concerned that the appointment has been revoked.

The national member body may appeal, within 30 days, against the decision to the chairman of ISO/TC 6, who 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 may uphold the decision of the technical group.

10.3 If no appeal is submitted, or if the decision of the technical group is upheld, ISO/TC 6 shall inform the laboratory and its member body that the appointment has been revoked. ISO/TC 6 shall inform all P- and O-members that the appointment has been revoked and shall remove the name of the laboratory from the list of currently approved standardizing and authorized laboratories.

10.4 Further appeals should conform to the procedure given in the ISO/IEC Directives Part 1:2001, Clause 5.

10.5 Direct expenses incurred during the course of revocation activities shall be borne by the standardizing or authorized laboratory involved. Typically, these would include the cost of necessary travel and lodging. Every effort shall be made to keep these to a minimum, and they shall be agreed upon in advance by both parties.

11 List of standardizing and authorized laboratories

A list of names and addresses of standardizing and authorized laboratories and the applicable ISO reference 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.

The list of standardizing and authorized laboratories maintained by the ISO/TC 6 Secretariat shall include the names of the persons directly responsible for the technical management of each standardizing and authorized laboratory.

The list shall be reviewed and dated by the ISO/TC 6 Secretariat at least during the first half of each even-numbered year.

Annex A
(informative)

Hierarchy of ISO reference standards (IR)

This annex was designed to show the hierarchy of ISO reference standards of level one (IR1), level 2 (IR2) and level three (IR3). Figure A.1 illustrates this hierarchy and associates each level of standards with their intended use and with the type of laboratory that will be using these standards. Each level of reference standard is defined in Clause 3.

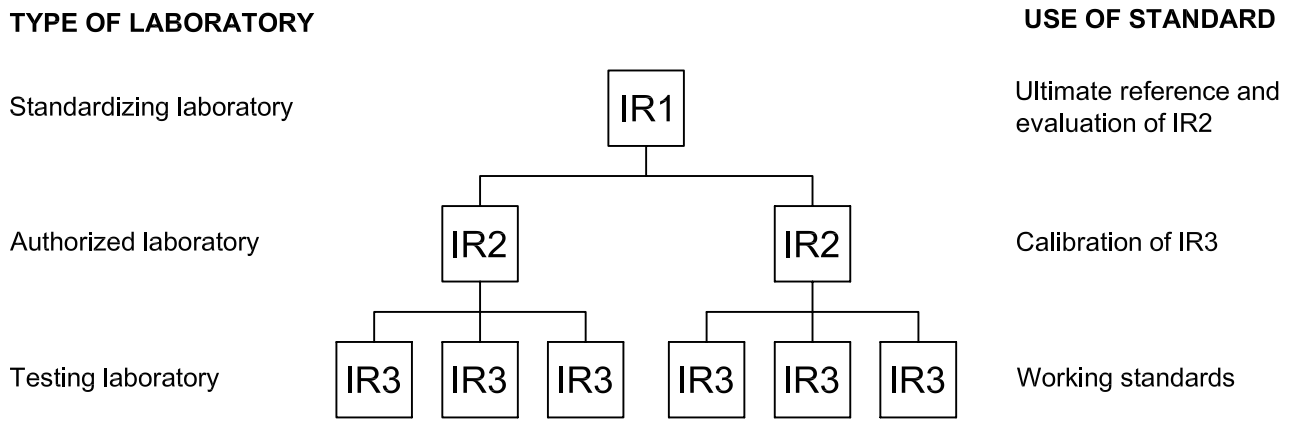

Figure A.1 — Hierarchy of ISO reference standards (IR)

ICS 85.020; 85.040; 85.060

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