

**CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE
DIVISION OF MEASUREMENT STANDARDS**

**FIELD REFERENCE MANUAL
2015**

**California Code of Regulation
Title 4, Division 9**

NIST Handbook 44

**Article 1. National Uniformity, Exceptions and Additions
Sections 4000. Through 4002.8
Introduction**



DISCLAIMER

This document represents the Division of Measurement Standards' field manual for enforcing regulations pertaining to weights and measures in California. This field manual is not to be considered as the official Code of Regulations, as published by Barclays Law Publishers.

NOTE: Language in Handbook 44 that is not adopted is annotated “[NOT ADOPTED]” in this document.

NOTE: Requirements are different than, or in addition to, the requirements of Handbook 44 are included in the appropriate section this document. They are shaded, bordered, and numbered in the 4002 series to differentiate them from the Handbook 44 requirements.

To find the latest online version of the California Code of Regulations (CCR) Title 4, Division 9, visit the California Office of Administration Law (OAL) at:

<http://ccr.oal.ca.gov/linkedslice/default.asp?SP=CCR-1000&Action=Welcome>

The CCR may also be accessed at <http://oal.ca.gov/> by selecting the link Titled “California Code of Regulations” under the list of “Sponsored Links” in the left column on the OAL Home page.

For information concerning the contents of this document, please contact the Division of Measurement Standards by e-mail at dms@cdfa.ca.gov.

NIST Handbook 44 (2015 Edition) - Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices as adopted by the 98th National Conference on Weights and Measures in July 2014 is available at:

www.nist.gov/pml/wmd/pubs/hb44.cfm

CHAPTER 1.
TOLERANCES AND SPECIFICATIONS FOR
COMMERCIAL WEIGHING AND MEASURING DEVICES

Article 1. National Uniformity, Exceptions and Additions

§4000. Application. See Barclays for actual Text

NOTE: This section incorporates the adoption, by reference, of the National Institute of Standards and Technology Handbook 44.

§4000.1 California Type Approval Fees. Each person or business submitting for or seeking approval of a type or design of a weight, measuring, weighing, measuring or counting device or for a design or type of device used for commercial purposes, shall pay to the Department of Food and Agriculture, for deposit into the Food and Agriculture Fund, the following fees:

- (a) A nonrefundable application fee in the amount of \$500, submitted at the time of application. No evaluation work will begin until this fee is paid.
- (b) A deposit based on the evaluator's estimated time and per diem, travel and transportation costs, equipment needed, and type of tests to be performed. Any remaining costs not covered by the deposit(s) shall be charged and collected before the issuance of the Certificate of Approval.
- (c) At the time of issuance of a Certificate of Approval, all remaining deposit monies shall be refunded to the applicant.
- (d) An application will be considered abandoned after 90 days of inactivity, if an applicant has not paid the required deposit of fees or if the applicant is non-responsive to questions asked or submission of additional information as required to start or finish the type approval process, or for nonpayment of fees within 90 days, and the applicant will be required to reapply and pay the required fees again.

NOTE: Authority cited: Sections 12027, 12107 and 12500.9 Business and Professions Code. Reference: Section 12107 and 12500.9 Business and Professions Code.

§4000.2 The fees for type evaluation are as follows:

- (a) Evaluator Time. The evaluator hourly rate (Department employee) is \$150 per hour. The overtime rate is one and a half times the hourly rate. If a non-Departmental evaluator is used, the applicant will be billed directly at a rate set by them.
- (b) Per Diem. The per diem rate shall be the current rate established by the California Department of General Services in the State Administrative Manual.
- (c) Travel and Transportation Costs. These shall be the actual round trip costs of transportation for the evaluator to and from the evaluator's home base and the test site, in the event that tests cannot be performed locally. Transportation costs include evaluator's time, airfare, rail or other fare, vehicle rental, tolls, parking and mileage costs.
- (d) Equipment.
 - (1) Environmental Chamber: \$600 per device per full cycle, which includes testing at four different temperatures at three hours per temperature. \$300 per device for less than a full cycle.
 - (2) Pickup Truck, Van, or other Light Duty Vehicle: \$48 per day plus \$0.55 per mile.
 - (3) Pickup Truck, Van, or other Light Duty Vehicle used for carrying or pulling standards or equipment: \$60 per day and \$0.72 per mile.
 - (4) Heavy Capacity Scale Test Truck, carrying standards up to 20,000 lb: \$200 minimum charge, \$600 per day, plus \$3.60 per mile.
 - (5) Liquid Propane Prover Trailer, 25 and 100 gallon sizes: \$240 per day.
 - (6) Compressed Natural Gas Prover Bottle, (9.33 GGE or 53 lbs.): \$120 per day.
 - (7) Electric Watt-Hour Meter Test Unit: \$100 per day.
 - (8) One, Three, or Five Gallon Test Measure: \$40 per day per test measure.
 - (9) 50 Gallon Prover: \$100 per day.
 - (10) 305 Gallon Prover: \$125 per day.
 - (11) Gravimetric Test Equipment: \$125 per day.
 - (12) Stillman Bottle: \$100 per day.
 - (13) Nozzle Test Vessel: \$75 per evaluation Bell Prover: \$125 per vapor meter evaluated.
 - (14) Water Meter Test Bench: \$100 per water meter evaluation.
 - (15) Repetitive Load Tester: \$50 per device \leq 50 lb and \$75 per device $>$ 50 lb, per day.

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(16) Other unspecified equipment necessary for the evaluation: \$100 per day.

(e) Additional Tests: Utility Meters and Load Cells.

- (1) Utility Meter Laboratory Throughput: \$125 per device for each vapor meter, \$20 per day for each water meter, \$15 per day for each electric meter.
- (2) Load Cell Testing and Equipment: \$7,200 per evaluation and \$3,600 for each additional evaluation per application.

(f) Certificate fees and other charges.

- (1) Certificate of Approval: \$750 per application or device, up to two pages.
- (2) Additional Pages, Certificate Updates, Amendments: \$180 per each page reviewed, modified, or changed.
- (3) Letter of Certificate from California Air Resources Board: \$300 per device, component, or part reviewed.

NOTE: Authority cited: Sections 12027, 12107 and 12500.9 Business and Professions Code. Reference: Section 12107 and 12500.9 Business and Professions Code.

§4000.3 Each person or business having an approved type or design of a weight, measuring, weighing, measuring or counting device or for a design or type of device used for commercial purposes, shall pay to the Department of Food and Agriculture, for deposit into the Food and Agriculture Fund, an annual administrative fee for the reasonable costs incurred for the maintenance of type approval certificates in hard copy and electronic formats of \$200 per Certificate. The annual administrative fee shall be paid on the first anniversary after a Certificate is issued, and each year thereafter that the design or type of device is being manufactured.

NOTE: Authority cited: Sections 12027, 12107 and 12500.9 Business and Professions Code. Reference: Section 12107 and 12500.9 Business and Professions Code.

§4001. – Exceptions. See Barclays for actual Text

NOTE: The following sections of Handbook 44 are not adopted and are annotated “Not Adopted” in the text:

1.10. General Code.

G-S.1.2. Remanufactured Devices and Remanufactured Main Elements.

G.T.1. Acceptance Tolerances.

- (b) [NOT ADOPTED]
- (c) [NOT ADOPTED]
- (d) [NOT ADOPTED]

2.20. Scales.

S.1.8.4. Customer’s Indications.

N.3. Minimum Test Weights and Test Loads*.

UR.2.6.1. Vehicle Scales.

UR.3.7. Minimum Load on a Vehicle Scale.

3.30. Liquid Measuring Devices.

N.4.1.1. Wholesale Devices Equipped With Automatic Temperature Compensating Systems.

3.31. Vehicle-Tank Meters.

UR.2.2. Ticket Printer; Customer Ticket.

3.32. Liquefied Petroleum Gas and Anhydrous Ammonia Liquid-Measuring Devices.

S.2.6. Automatic Temperature Compensation.

N.4.1.1. Automatic Temperature Compensation.

UR.2.3. Vapor Return Line.

3.33. Hydrocarbon Gas Vapor - Measuring Devices.

S.4.3. Temperature Compensation.

3.39. Hydrogen Gas-Measuring Devices.

Section 3.39. Hydrogen Gas-Measuring Devices – Tentative Code

A.2. Exceptions

(c). Devices used for dispensing a hydrogen gas with a hydrogen fuel index lower than 99.97 % and concentrations of specified impurities that exceed level limits.

A.4. Type Evaluation.

N.3. Test Drafts.

N.4.1. Master Meter (Transfer) Standard Test.

N.4.2. Gravimetric Tests.

N.4.3. PVT Pressure Volume Temperature Test.

N.6.1.1. Repeatability Tests.

T.2. Tolerances.

Table T.2.

T.3. Repeatability.

Appendix D. Definitions for:

Remanufactured Devices.

Remanufactured Element.

Repaired Devices.

Repaired Element.

Note: Authority cited: Sections 12027 and 12107, Business and Professions Code. Reference: Section 12107, Business and Professions Code.

§4002. – Additional Requirements. See Barclays for actual Text.

NOTE: These requirements are different than, or in addition to, the requirements of Handbook 44 and are included in the appropriate section of the text. They are shaded, bordered, and numbered in the 4002 series to differentiate them from the Handbook 44 requirements.

§4002.1. General Code (1.10.)

- (a) Type Approval Use.

§4002.2. Scales (2.20.)

- (a) Minimum Load on a Vehicle Scale.
- (b) Class III, Class III L and Unmarked Devices Used for Recycling.
- (c) Livestock Scales Not Equipped with Balance Indicator.
- (d) Customer's Indications.

§4002.3. Vehicle-Tank Meters. (3.31.)

- UR.2.2. Ticket Printer; Customer Ticket.

§4002.4. Liquefied Petroleum Gas and Anhydrous Ammonia Liquid-Measuring Devices (3.32.)

- (a) Temperature Compensation.
- (b) Non-applicable Provisions of Handbook 44, Section, 3.32., S.3.1 under certain conditions.
- (c) Wholesale Devices Equipped With Automatic Temperature Compensating Systems.
- (d) Vapor Return Line.
- (e) Signs.

§4002.5. Hydrocarbon Gas Vapor-Measuring Devices. (3.33.) Temperature Compensation

- (a) Leak Test.
- (b) Temperature Compensation.
- (c) Retention of Customer Invoices.

§4002.6. Water Meters (3.36.) [Repealed]

§4002.7. Farm Milk Tanks. (4.42.)

- (a) Calibration and Installation.

§4002.8. Liquid-Measuring Devices. (3.30.)

- (a) Wholesale Devices Equipped With Automatic Temperature Compensating Systems.

§4002.9. Hydrogen Gas-Measuring Devices. (3.39.)

S.5.2. Location of Accuracy Class 3.0, 5.0, and 10.0 Information:

Note:

EXAMPLE:

N.3. Test Drafts.

N.4.1. Master Meter (Transfer) Standard Test.

N.4.2. Gravimetric Tests.

N.4.3. PVT Pressure Volume Temperature Test.

N.6.1.1. Repeatability Tests.

T.2. Tolerances.

Table T.2. Accuracy Classes and Tolerances for Hydrogen Gas-Measuring Devices

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T.3. Repeatability.

T.6. Tolerance – Minimum Measures Quantity (MMQ).

NOTE: Authority cited: Sections 12027 and 12107, Business and Professions Code. Reference: Section 12107, Business and Professions Code.

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Introduction

A. Source.

The specifications, tolerances and other technical requirements in this handbook comprise all of those adopted by the National Conference on Weights and Measures, Inc. (NCWM). NCWM is supported by the National Institute of Standards and Technology (NIST), which provides its Executive Secretary and publishes some of its documents. NIST also develops technical publications for use by weights and measures agencies; these publications may subsequently be endorsed or adopted by NCWM.

The NCWM Committee on Specification and Tolerances (the Committee), acting at the request of the Conference or upon its own initiative, prepares with the technical assistance of the National Institute of Standards and Technology (NIST), proposed amendments or additions to the material adopted by NCWM (see Paragraph C). Such revisions, amendments, or additions are then presented to NCWM as a whole, where they are discussed by weights and measures officials and representatives of interested manufacturers, industries, consumer groups, and others. Eventually the proposals of the Committee, which may have been amended from those originally presented, are voted upon by the weights and measures officials, following the voting procedures in the NCWM Bylaws. A national consensus is required on all items adopted by the NCWM. A specification, tolerance, or other technical requirement is adopted when a majority of the states' representatives, and other voting delegates favoring such adoption, vote for approval.

All of the specifications, tolerances, and other technical requirements given herein are recommended by NCWM for official promulgation in and use by the states in exercising their control of commercial weighing and measuring apparatus. A similar recommendation is made with respect to the local jurisdictions within a state in the absence of the promulgation of specifications, tolerances, and other technical requirements at the state level.

B. Purpose.

The purpose of these technical requirements is to eliminate from use, weights and measures and weighing and measuring devices that give readings that are false, that are of such construction that they are faulty (that is, that are not reasonably permanent in their adjustment or will not repeat their indications correctly), or that facilitate the perpetration of fraud, without prejudice to apparatus that conforms as closely as practicable to the official standards.

C. Amendments.

The Committee on Specifications and Tolerances of the NCWM provides a mechanism for consideration of amendments or additions to the specifications, tolerances, and other technical requirements.

D. Submission of Agenda Items - Preamble.

NCWM Bylaws require that its officers and committees observe the principles of due process for the protection of the rights and interests of affected parties. Specifically, it requires that committees and officers: (a) give reasonable advance notice of contemplated studies, items to be considered for action, and tentative or definite recommendations for conference vote, and (b) provide that all interested parties have an opportunity to be heard.

E. Submission Process.

Anyone introducing an item to the Committee must initially use the regional weights and measures associations to consider its merits. Using the regional associations ensures discussion and evaluation of items at the grassroots level by involving the regional members in the development, evaluation, and justification of proposals. The regions include the Central, Northeastern, Southern, and Western Weights and Measures Associations. For information on the regional associations, visit www.ncwm.net.

To submit a proposal to a regional association, obtain *Form 15: Proposal to Amend Handbooks* at www.ncwm.net or by contacting NCWM via email at info@ncwm.net. Complete the form and submit it electronically in Microsoft Word format to NCWM at info@ncwm.net and copy the Executive Secretary at owm@nist.gov. An example of the Form 15

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template is provided at the end of this section. Instructions for completing the form are included with the electronic version of this template. To ensure that your proposal is included on the regional meeting agenda, submit at least two weeks in advance of the fall regional meeting. Regional meeting schedules are available on the NCWM website.

F. Procedures.

The NCWM Committee will consider items according to the following procedures:

1. NCWM Committees receive new items from regional associations, National Type Evaluation Technical Committees (Sectors), task groups, and subcommittees and as defined in Sections H and I. All items to be considered by the Committee for action at the upcoming Interim Meeting must be submitted electronically in Word format to NCWM by November 1.
2. NCWM will ensure that all committee members and technical advisors receive complete copies of all new items for consideration at the upcoming NCWM Interim Meeting.

G. Criteria for Inclusion on the NCWM Committee's Agenda.

1. Any item approved by at least one regional association and received by the November 1 deadline will be automatically placed on the Committee's Interim Meeting agenda.
2. Items that have not been approved by a regional association, but which are received by November 1, will be evaluated by the Committee using the criteria in Section H, Exceptions to Policy, and Section I, Committee Agenda.
3. Any proposal received after the November 1 deadline, but prior to the Interim Meeting, will be evaluated by the Committee according to Section H, Exceptions to Policy and Section I, Committee Agenda. Only those items determined to be a national "priority" will be included on its agenda.
4. Proposals must be in writing and must include:
 - a. a concise statement of the item or problem outlining the purpose and national need for its consideration. An electronic copy of the background material and proposed amendment(s) should be submitted in Microsoft Word format on a CD, DVD, or by electronic mail sent to **info@ncwm.net**;
 - b. background material, including test data, analysis of test data, or other appropriately researched and documented material for the Committee to evaluate when deciding its position or future activity on the proposal;
 - c. proposed solutions to problems stated in specific language and in amendment form as changes to Conference documents; and
 - d. if a proposal involves a new area of weights and measures activity, practical, realistic, and specific recommendations for laws or regulations to be adopted and test methods to be utilized to provide for proper enforcement.

When proposals are to modify or add requirements to existing publications, such as Handbook 44, the proposal should:

- 1) identify the pertinent portion, section, and paragraph of the existing publication that would be changed (e.g., Section 1.10. General Code, G-A.1. Commercial Law-Enforcement Equipment);
- 2) provide evidence of consistency with other NCWM publications such as with other specific device code sections;

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- 3) provide evidence of consistency with federal laws and regulations (e.g., U.S. Department of Agriculture [USDA]); and
- 4) relay the positions of businesses, industries, or trade associations affected by the proposal including supporting and opposing points of view.

H. Exceptions to Policy for Submission of Items to a Committee Agenda; Submission of “Priority” Items.

The Committee will use the following criteria to evaluate items that have not been approved by a regional association, but have been received by the November 1 deadline. If an item is received after the November 1 deadline, it will be included on the agenda if the Committee determines that it is a national “priority.”

Criteria for Inclusion on the Committee’s Agenda When No Regional Association Has Approved the Items:

1. Items must have significant legal impact on weights and measures laws and/or regulations involving:
 - (a) court cases/attorney general opinions; or
 - (b) pre-emption by federal statute or regulation; or
 - (c) conflicts with international standards; or
 - (d) items which could affect health and safety.
2. The Committee may contact parties that are potentially affected by an item (e.g., trade associations, industry, and consumer groups) for comments. The Committee may consider these comments and any other information in determining if the item should be included on its agenda.
3. When the Committee determines that it should consider an item as a “priority” (using the criteria in (1)), the item will be handled in the following manner:
 - a. A “priority” item received prior to the Interim Meeting may be added to the Interim Meeting agenda by a majority vote of the Committee.
 - b. A “priority” item received after the Interim Meeting may be added to the Committee’s Annual Meeting agenda as:
 - 1) a discussion item by a majority vote of the Committee; or
 - 2) as a voting item by a majority vote of the Committee and the NCWM Board of Directors.

I. Committee Agenda.

1. The Committee will review items that have been submitted and selected by a majority vote to be included on its agenda. The Committee will only include those items that have been:
 - a. approved by at least one of the regional associations; or
 - b. forwarded by other committees, subcommittees, NTETC Sectors, task forces, or work groups, or those items that meet the criteria in Section H, Exceptions to Policy.
2. The Committee will publish an agenda (NCWM Publication 15) that identifies the items to be discussed during the Interim Meeting. This agenda will be distributed to members approximately 30 days prior to the meeting. The agenda will be provided upon request to all other interested parties.
(Amended 1998)

J. Interim Meeting.

- (1) The Committee shall hold public hearings at the Interim Meeting for the purpose of discussing and taking comments on all agenda items.
- (2) Upon request, the Committee will provide the opportunity for presentations by government officials, industry representatives, consumer groups, or other interested parties during the Interim Meeting. Requests to make presentations must be received by the Committee Chairman or Technical Advisor at least two weeks prior to the start of the meetings.

K. Interim Meeting Report.

- (3) Items under consideration by the Committee and about which the Committee offers comments or recommendations to the NCWM to act upon during the Annual Meetings will be included in the Committee's Interim Reports published in the Annual Meeting Program and Committee Reports (NCWM Publication 16).
- (4) The Annual Meeting Program and Committee Reports will be prepared and distributed to Conference members approximately three months prior to the NCWM Annual Meeting.

L. Classifications for Agenda Items.

At the Interim Meeting, the Committee can classify proposals in one of the following ways:

1. "Voting" – These are items the Committee believes are fully developed and ready for final consideration of the voting membership. Each item has either received majority support from the Committee or the Committee has reached agreement that it is ready for voting status to let NCWM membership decide. The Committee has the ability to remove items from the voting agenda at the Annual Meeting by changing the status prior to a vote of the NCWM membership. The Committee may amend voting items during the course of the Annual Meeting based on additional information received following the Interim Meeting and testimony received at the Annual Meeting. These items may also be amended by the voting membership during the voting session of the Annual Meeting following the procedures outlined in the NCWM Bylaws; or
2. "Informational" – These items are deemed by the Committee to have merit. They typically contain a proposal to address the issue at hand and a meaningful background discussion for the proposal. However, the Committee wants to allow more time for review by stakeholders and possibly further development to address concerns. The Committee has taken the responsibility for any additional development of Informational items. For particularly difficult items, the Committee may assign the item to an existing Subcommittee under its charge or request that the NCWM Chair appoint a special task group that reports to the Committee. At the Annual Meeting, the Committee may change the status of Informational items, but not to Voting status because the item has not been published as such in advance of the meeting; or
3. "Developing" – These items are deemed by the Committee to have merit, but are found to be lacking enough information for full consideration. Typically the item will have a good explanation of the issue, but a clear proposal has yet to be developed. By assigning Developing status, the Committee has sent the item back to the source or assigned it to some other entity outside the scope of the Committee with the responsibility of further development. The Committee Report will provide the source with clear indication of what is necessary to move the item forward for full consideration. The item will be carried in the Committee agenda in bulletin board fashion with contact information for the person or organization that is responsible for the development. Since the Committee is not required to receive testimony on Developing items, this status should be carefully implemented so as not to weaken the standards development process; or
4. "Withdrawn" – These are items that the Committee has found to be without merit. The Committee's determination to withdraw an item should not be based on the Committee's opinion alone, but on the input received from stakeholders. The Committee's report will contain an explanation for the withdrawal of the item. Once an item appears in NCWM Publication 16 as Withdrawn, the status of that item may not be amended. The item may be reintroduced through the regional associations for consideration as a new item.

(Amended 2013)

M. Comments on Interim Reports.

1. Weights and measures officials, industry representatives, and all others are encouraged to submit written comments on items in the Committees' Interim Reports.
2. All comments on the Interim Meeting Report must be submitted to the Committee with a copy to the Executive Secretary no later than one month preceding the opening of the Annual Meeting.

N. Annual Meeting.

1. The Committee will hold a public hearing at the Annual Meeting to discuss issues on its agenda.
2. Those who want to speak on an item during the public hearings should request time from the Committee Chairman. The Committee Chairman may impose time limits on presentations, the discussion of a question, or the discussion of a proposed amendment.

O. Final Committee Reports and Conference Action.

1. Following the public hearings, the Committee will prepare its final report for action by the voting membership of the Conference. Copies of the final report will be provided to the membership prior to the voting session for that report.
2. The Chairman of the Committee will present the final report of the Committee to the Conference body. A vote will be taken on items, proposals, or sections in the report as circumstances require. The Conference will vote on the entire final report as presented in accordance with established Conference voting procedures. Parliamentary procedures according to Robert's Rules of Order, as amended by NCWM Bylaws, must be adhered to in the presentation of, and any action on, a Standing Committee report.
(Amended 1998)

P. System of Paragraph Designation.

In order that technical requirements of a similar nature, or those directed to a single characteristic, may be grouped together in an orderly fashion, and to facilitate the location of individual requirements, the paragraphs of each code are divided into sections. Each section is designated by a letter and a name, and each subsection is given a letter-number designation and a side title.

The letter that appears first in a paragraph designation has a specific meaning, as follows:

- G.** The letter G is a prefix and indicates that the requirement is part of the General Code.
- A. Application.** These paragraphs pertain to the application of the requirements of a code.
- S. Specification.** These paragraphs relate to the design of equipment. Specification paragraphs are directed particularly to manufacturers of devices.
- N. Note.** These paragraphs apply to the official testing of devices.
- T. Tolerance.** Tolerances are performance requirements. They fix the limit of allowable error or departure from true performance or value.
Sensitivity. The sensitivity requirements, applicable only to nonautomatic-indicating scales, are performance requirements and are lettered with a "T."
- UR. User Requirement.** These paragraphs are directed particularly to the owner and operator of a device. User requirements apply to the selection, installation, use, and maintenance of devices.

- D. Definitions of Terms.** A definitions section appears in Appendix D to provide the definition of the terms having a special meaning.

The numerical designation after a letter follows the decimal system of paragraph identification that fixes both the relationship and the limitation of the requirements of the paragraph. For example, in the Scales Code, under Specifications, the following numerical designations occur:

S. Specifications

S.1. Design of Indicating and Recording Elements and of Recorded Representations.

- S.1.1. Zero Indication.
 - S.1.1.1. Digital Indicating Elements.
 - S.1.1.2. No-Load Reference Value.
- S.1.2. Value of Scale Division Units.
 - S.1.2.1. Digital Indicating Scales.
- S.1.3. Graduations.
 - S.1.3.1. Length.
 - S.1.3.2. Width.
 - S.1.3.3. Clear Space Between Graduations.

In this example, paragraphs S.1.1., S.1.2., and S.1.3. are directed and limited to paragraph S.1., which pertains to the design of indicating and recording elements and of recorded representations. Paragraphs S.1.1.1. and S.1.1.2. are directly related to each other, but they are limited to the design of zero indication. Likewise, paragraphs S.1.3.1., S.1.3.2., and S.1.3.3. are directly related to each other, but they are limited to the design of graduations.

This handbook conforms to the concept of primary use of SI (metric) measurements recommended in the Omnibus Trade and Competitiveness Act of 1988 by citing SI metric units before U.S. customary units where both units appear together and placing separate sections containing requirements for metric units before corresponding sections containing requirements for customary units. Occasionally, a paragraph or table carries the suffix “M” because the requirement in SI units is shown as a separate statement, rather than combined with the U.S. customary units. In these few instances, separate requirements were judged to be more easily understood than attempting to combine SI and U.S. customary units in a single paragraph or table. In some cases, however, trade practice is currently restricted to the use of customary units; therefore, some requirements in this handbook will continue to specify only customary units until the Conference achieves a broad consensus on the permitted metric units.

Q. Classification of Requirements.

The classification of requirements into “retroactive” and “nonretroactive” status is made in order that the requirements may be put into force and effect without unnecessary hardship and without wholesale condemnation of apparatus. Retroactive requirements are enforceable with respect to all equipment and are printed in upright roman type. Nonretroactive requirements are those that, while clearly desirable, are not so vital that they should at once be enforced with respect to all apparatus. Nonretroactive requirements are printed in *italic type*.

It is not expected that, after their promulgation in a given jurisdiction, nonretroactive requirements will always remain nonretroactive. It is entirely proper that a weights and measures official, following a careful analysis of existing conditions, fix reasonable periods for the continuance of the nonretroactive application of particular requirements, after which such requirements will become retroactive. These periods should be long enough to avoid undue hardship to the owners or operators of apparatus and, in the case of some requirements, should approximate the average useful life of the apparatus in question.

In order that all interested parties may have timely and ample notice of impending changes in the status of requirements, the following procedure is suggested for the official who plans to change the classification of requirements. If sufficient data are available to make such action feasible, publish in combination with the codes themselves the date or dates at which nonretroactive requirements are to become retroactive. In other cases, give equally effective notice at the earliest practicable date.

A nonretroactive requirement, in italic type, will indicate the year from which it should be enforced and, in some cases, the date the requirement shall be changed to retroactive status. For example, [*Nonretroactive as of 1978 and to become retroactive on January 1, 1985*]. As a general rule, each nonretroactive requirement is reviewed after it has been in effect for 10 years to determine the appropriateness of its nonretroactive status.

R. Using the Handbook.

Handbook 44 is designed to be a working tool for federal, state, and local weights and measures officials, the equipment manufacturers, installers, and service agencies/agents. As noted in Section 1.10. General Code paragraph G-A.1. Commercial and Law-Enforcement Equipment, applicable portions of Handbook 44 may be used by the weights and measures official to test noncommercial weighing and measuring equipment upon request. Additionally, applicable language in Handbook 44 may be cited as a standard in noncommercial applications, for example, when the handbook is referenced or cited as part of a quality system or in multiple-party contract agreements where noncommercial weighing or measuring equipment is used.

The section on Fundamental Considerations (Appendix A) should be studied until its contents are well known. The General Code, with general requirements pertaining to all devices, obviously must be well known to a user of the handbook. The makeup of the specific codes, the order of paragraph presentation, and particularly paragraph designation are worthy of careful study. It is not deemed advisable for a user to attempt to commit to memory tolerances or tolerance tables, even though these are used frequently. For the handbook to serve its purpose, it should be available when any of its requirements are to be applied. Direct reference is the only sure way to apply a requirement properly and to check whether other requirements may be applicable.

This handbook supplies criteria which enable the user to determine the suitability, accuracy, and repetitive consistency of a weighing or measuring device, both in the laboratory and in the field. However, not all code sections can be appropriately applied in both settings. Since some sections are designed to be applied specifically to tests performed under laboratory conditions, it would be impractical or unrealistic to apply them to field tests. Not all tests described in the "Notes" section of the handbook are required to be performed in the field as an official test. An inspector may officially approve or reject a device which has been tested in accordance with those sections applicable to the type of test being conducted.

(Paragraph added 1996)

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