

## 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). Contact NCWM at:

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The 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 or its members.

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.

(Amended 2015)

### 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

Proposed amendments to NIST Handbook 44 are deliberated and developed by NCWM's Committee on Specifications and Tolerances before presentation to the general membership for a vote. In some instances, amendments that significantly affect other NIST Handbooks may be processed jointly by two or more committees.

Amendments to the handbooks are made in accordance with NCWM procedures and policies. The process begins at the regional weights and measures association meetings in the fall of each year and is culminated at the NCWM Annual Meeting in July. After passing through one or more of the regional associations the proposed amendment is placed on the agenda of the appropriate NCWM committee for consideration at NCWM's Interim Meeting in January and after final deliberation and development by the committee the amendment may be presented to the membership for a vote at the annual NCWM meeting in July. NCWM policy provides for exceptions to the process to accommodate urgent or priority items. NIST staff provides technical assistance and advice throughout the process.

The policy is available on the NCWM website at [www.ncwm.com](http://www.ncwm.com). For information on the regional weights and measures associations, visit [www.ncwm.com/meetings](http://www.ncwm.com/meetings).

(Amended 2015)

### D. 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.

## E. 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.

## F. 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)

National Conference on Weights and Measures / National Type Evaluation Program

**Form 15: Proposal to Amend NIST Handbooks, Guidance Documents, NCWM Bylaws or NCWM Publication 14**Email proposals in Microsoft Word format to [info@ncwm.com](mailto:info@ncwm.com) by August 15.

Each regional association will hold hearings on proposals in the fall. See meeting dates at [www.ncwm.com/meetings](http://www.ncwm.com/meetings). If any region deems that the item has merit, the region will forward the item to NCWM for national consideration. For more information on the Form 15 process, visit [www.ncwm.com/standards-dev](http://www.ncwm.com/standards-dev).

GENERAL INFORMATION			
<b>1. Proposal to:</b>			
__ Laws & Regulations __ Specifications & Tolerances __ Professional Development __ Board of Directors __ NTEP Committee			
<b>2. Submitter's Name:</b>		<b>3. Date:</b>	
<b>4. Submitter's Organization:</b>		<b>5. Address:</b>	
<b>6. City:</b>	<b>7. State:</b>	<b>8. Zip Code:</b>	<b>9. Country:</b>
<b>10. Phone Number:</b>	<b>11. Fax Number:</b>	<b>12. Email Address:</b>	
PROPOSAL INFORMATION			
<b>13. Purpose:</b> Concise statement as to the intent or purpose of this proposal, such as problem being fixed. (Do not include justification here.)			
<b>14. Document to be Amended:</b>			
__ Handbook 44 __ Handbook 130 __ Handbook 133 __ NCWM Guidance Document __ NCWM Bylaws __ NTEP Administrative Policy			
<b>15. Cite portion to be Amended:</b> Submit a separate Form 15 for each code, model law or regulation to be amended.			
Section: Paragraph:			
<b>16. Proposal:</b> Use <del>strikeout</del> to show words to be deleted and <u>underline</u> to show new words. (Do not use track changes.)			
<b>17. For Handbook 44 proposals, indicate one of the following:</b>			
<input type="checkbox"/> <b>Retroactive</b> (Enforceable with respect to all devices)			
<input type="checkbox"/> <b>Nonretroactive</b> (Enforceable on or after the effective date for devices a) manufactured within a state after the effective date, b) both new and used equipment brought into a state after the effective date, c) used in noncommercial applications which are placed into commercial use after the effective date, and d) undergoing type evaluation including devices that have been modified to the extent that a new NTEP Certificate of Conformance is required.)			
<b>18. Justification:</b> Include national importance, background on the issue, and reference to supporting data or documents.			
<b>19. Possible Opposing Argument's:</b> Demonstrate that you are aware and have considered possible opposition.			
<b>20. Requested Action if Considered for NCWM Agenda:</b>			
__ Voting Item __ Developing Item __ Informational Item __ Other (Please Describe):			
<b>21. List of Attachments:</b>			

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Revised: June 2023