

**2022 Amendments for the 2023 Edition of Handbook 44  
2023 Revision Index**

No California Code of Regulations were enacted in 2022

**NIST Handbooks - Amendments and Editorial Changes:  
See the 2022 changes to NIST Handbooks 44, 130 and 133**

**NIST HB 44, 2023 Current Edition** – Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices

[2023 Amendments/Editorial Changes PDF](#)

**NIST HB 130, 2023 Current Edition** – IV. Uniform Packaging and Labeling Regulation – Chapter 4, Uniform Regulations

[2023 Amendments/Editorial Changes PDF](#)

**NIST HB 133, 2020 Edition** – Checking the Net Contents of Packaged Goods

[2023 Amendments/Editorial Changes PDF](#)

The following table lists the codes, paragraphs, and pages in which the 107th National Conference on Weights and Measures adopted amendments. In the column headed “Action,” changes are noted as “added,” “amended,” “deleted,” or “renumbered.” Each code, section, or paragraph that has been changed will be noted as “Added 2022” or “Amended 2022.”

**2022 Amendments for 2023 Handbook 44**

SECTION	CODE	S&T ITEM NUMBER	PARAGRAPH	ACTION	HB-44 PAGE
1.10.	General	GEN-22.1	G-A.1.	Amended	1-3
3.30	Liquid-Measuring Devices	LMD-21.1	Table S.2.2.	Amended	3.13
3.30	Liquid-Measuring Devices	LMD-22.1	Table T.2.	Amended	3-21
3.32.	LPG and Anhydrous Ammonia LMDs	LPG-22.1	A.1.	Amended	3-47
3.37.	Mass Flow Meters	MFM 22.1	Table T.2.	Amended	3-119

Amendments and Editorial Changes to the Field Reference Manual

SECTION	CODE	S&T ITEM NUMBER	PARAGRAPH	ACTION	HB-44 PAGE
3.40.	Electric Vehicle Fueling Systems (EVFS)	EVF-22.1 (Priority Item Added to Committee Agenda June 24, 2022)	Entire Code	Code Upgraded from tentative to permanent and preamble modified	3-151 to 3-164
3.40.	EVFS	EVF-20.1	S.1.3.1., S.1.3.2	Amended	3-154
3.40.	EVFS	EVF-22.1 (Priority Item Added to Committee Agenda June 24, 2022)	S.2.7., N.5.2., and T.2.1.	Amended	3-156, 3-160, 3-161
5.54	Taximeters	TXI-22.1	Table S.5.	Amended	5-32
Appendix D	Definitions	EVF-22.1 (Priority Item Added to Committee Agenda June 24, 2022)	alternating current (AC); ampere; creep; current; direct current (DC); electric vehicle, plug - in; electric vehicle supply equipment (EVSE); electricity as vehicle fuel; energy; energy flow; EVSE field reference standard; hertz (Hz); kilowatt (kW); kilowatt-hour (kWh); load, full; load, light; master meter, electric; megajoule (MJ); meter, electricity; metrological components; nationally recognized testing laboratory (NRTL); ohm ( $\Omega$ );		

Amendments and Editorial Changes to the Field Reference Manual

SECTION	CODE	S&T ITEM NUMBER	PARAGRAPH	ACTION	HB-44 PAGE
			percent registration; power factor; serving utility; starting load; submeter; test accuracy – in - service; test amperes (TA); thermal overload protector; vehicle connector; Amendments and Editorial Changes Handbook 44 – 2023 x This publication is available free of charge from: <a href="https://doi.org/10.6028/NIST.HB.44-2023">https://doi.org/10.6028/NIST.HB.44-2023</a> vehicle coupler; vehicle inlet; volt; watt; watthour (Wh)		
Appendix D	Definitions	EVF-22.1 (Priority Item Added to Committee Agenda June 24, 2022)	audit trail; calibration parameter; configuration parameter; equipment, commercial; event counter; event logger; face; minimum measured quantity (MMQ); non-resettable totalizer; primary indicating element or recording element; remote configuration capability; retail device; unit price	Amended by adding “3.40” to the list of applicable codes to which the definition applies	D-7 to D-32
Appendix D	Definitions	EVF-22.1 (Priority Item Added to Committee Agenda	recorded representation; and recording element	Added new definitions applicable to Section 3.40	D-27

Amendments and Editorial Changes to the Field Reference Manual

SECTION	CODE	S&T ITEM NUMBER	PARAGRAPH	ACTION	HB-44 PAGE
		June 24, 2022)			
Appendix D	Definitions	EVF-22.1 (Priority Item Added to Committee Agenda June 24, 2022)	face	Amended	D-15
Appendix D	Definitions	EVF-22.1 (Priority Item Added to Committee Agenda June 24, 2022)	liquefied petroleum gas retail motor-fuel device	Added	D-18
Appendix D	Definitions	EVF-22.1 (Priority Item Added to Committee Agenda June 24, 2022)	motor-fuel device or motor-fuel dispenser or retail motor-fuel device	Amended	D-21

**2022 Editorial Changes for 2023 Handbook 44**

Section	Code	Paragraph	Action	Page
1.10	General Code	G-S.5.6.1. Indicated and Recorded Representation of Units. – Appropriate abbreviations.	<b>Note:</b> SP 811 can be viewed or downloaded at <a href="http://www.nist.gov/pml/special-publication-811">www.nist.gov/pml/special-publication-811</a> or by going to <a href="http://www.nist.gov/pml/owm">www.nist.gov/pml/owm</a> and selecting <b>Weights and Measures</b> “Publications”, then selecting <b>“NIST Special Publications,”</b> and then clicking on the link below <b>“NIST (SP 811): Guide for the Use of the International System of</b>	1-8

Amendments and Editorial Changes to the Field Reference Manual

Section	Code	Paragraph	Action	Page
			Units (SI)” showing the year of the current edition.	
2.20	Scales	Table 1M. Minimum Travel of Weighbeam of Beam Scale Between Limiting Stops	<p><b>&lt; 30 or less</b></p> <p><b>&gt; 30+ to 50, inclusive</b></p> <p><b>&gt; 50+ to 100, inclusive</b></p> <p><b>&gt; Over 100</b></p>	2-10
2.20	Scales	Table 1. Minimum Travel of Weighbeam of Beam Scale Between Limiting Stops	<p><b>&lt; 12 or less</b></p> <p><b>&gt; 12+ to 20, inclusive</b></p> <p><b>&gt; 20+ to 40, inclusive</b></p> <p><b>&gt; Over 40</b></p>	2-10
2.20	Scales	Table 4. Minimum Test Weights and Test Loads	<p><b>&gt; 20 001 kg+</b></p> <p><b>&gt; 40 001 lb+</b></p>	2-35
2.20	Scales	Table 5. Maintenance and Acceptance Tolerances for Unmarked Postal and Parcel Post Scales	<p><b>0 to 4, inclusive*</b></p> <p><b>&gt; over 4*</b></p> <p><b>0 to 1, inclusive</b></p> <p><b>&gt; over 1</b></p> <p><b>0 to 7, inclusive</b></p> <p><b>&gt; 7+ to 24, inclusive</b></p> <p><b>&gt; 24+ to 30, inclusive</b></p> <p><b>&gt; over 30</b></p>	2-41
3.33	Hydrocarbon Gas Vapor-Measuring Devices	UR.2.3. Correction for Elevation.	The appropriate altitude correction factor from Table 2M. Corrections for Altitude, Metric Units or Table 2. Corrections for Altitude, U.S. Customary Units shall be used. (The table is modified from <b>NIST Handbook 117 NBS Handbook 117, Examination of Vapor-Measuring Devices for Liquefied Petroleum Gas.</b> )	3-71

Amendments and Editorial Changes to the Field Reference Manual

Section	Code	Paragraph	Action	Page
3.39	Hydrogen Gas-Measuring Devices	Headers	Remove the word “Code” from the headers to be consistent with other codes in NIST Handbook 44.	3-139 to 3-150
3.39	Hydrogen Gas-Measuring Devices	A. Application	(a) 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 in the latest version of SAE International J2719 <b>“Hydrogen Fuel Quality for Fuel Cell Vehicles.”</b>	3-141
Appendix B	Units and Systems of Measurement – Their Origin, Development, and Present Status	Multiple	<ul style="list-style-type: none"> <li>• Several references and citations were updated to provide URL links to NIST publications, Federal Register Notices, and federal statutes and code of regulations.</li> <li>• Clarified that the BIPM Consultative Committees of Units publish practical methods, known as <i>Mise en Pratique</i>, to realize the seven SI base units.</li> <li>• Added additional examples of derived units.</li> <li>• Additional information was added to fully describe the retirement of the U.S. survey foot.</li> <li>• Clarified it is incorrect to describe traditional units used in the United States as “Imperial” or “British” and that “U.S. customary” is the correct term.</li> <li>• Removed several unnecessary pronouns and replaced with specific nouns.</li> </ul>	B-6 to B-14

Amendments and Editorial Changes to the Field Reference Manual

Section	Code	Paragraph	Action	Page
			<ul style="list-style-type: none"> <li>• Added references to NIST online calibration service resources.</li> <li>• Aligned content for length, mass, and capacity to better reflect current NIST and State Laboratory Program participant laboratories calibration services.</li> </ul>	
Appendix C	General Tables of Units	Multiple	<ul style="list-style-type: none"> <li>• Information was expanded to fully describe the retirement of the U.S. survey foot, including 3 new tables that present U.S. survey unit conversion factors in terms of the International foot. Section 2 surveying length and area tables were reformatted to align with the U.S. survey foot retirement FRN.</li> <li>• Several NIST publications, Federal Register Notices, and federal statutes and code of regulations references were updated in the footnotes. Website URLs were verified and updated.</li> <li>• Unit symbols and abbreviations were added to the “starting units” column to improve usability.</li> <li>• Removed the ångström unit to align with the latest edition of the BIPM SI Brochure and NIST SP 330, as it was eliminated in 2019.</li> <li>• Added footnote guidance for users to consult federal/state laws and regulations and industry</li> </ul>	C-1 to C-30

Amendments and Editorial Changes to the Field Reference Manual

Section	Code	Paragraph	Action	Page
			documentary standards to confirm the barrel quantity used for a specific application.	

[NIST HB 130, 2023 Current Edition](#) – IV. Uniform Packaging and Labeling Regulation – Chapter 4, Uniform Regulations - Handbook-130 pages 51-98

**2022 Amendments for 2023 Handbook 130 – Uniform Packaging and Labeling Regulation**

Law or Regulation	L&R Committee Item No.	Section	Action	UPLR Page
Uniform Packaging and Labeling Regulation	PAL-19.1	2.8. Multiunit Package	Amended	58
Uniform Packaging and Labeling Regulation	PAL-22.3	8.2. Calculation of Area of Principal Display Panel for Purposes of Type Size	Amended	73

**2022 Editorial Changes for 2023 NIST Handbook 130 – Uniform Packaging and Labeling Regulation**

Law or Regulation	L&R Committee Item No.	Section	Action	UPLR Page
Introduction	Section	Section	Updated Form	4
Uniform Packaging and Labeling Regulation	PAL-19.1	2.8. Multiunit Package	Amended	58
Uniform Packaging and Labeling Regulation	PAL-22.3	8.2. Calculation of Area of Principal Display Panel for Purposes of Type Size	Amended	73



[NIST HB 133, 2023 Edition](#) - The following table indicates the items amended by the 107th (2022) National Conference on Weights and Measures (NCWM). As appropriate, the text on the cited pages indicates the changes to a Handbook 133 section, or paragraph as “Added 2022” or “Amended 2022.” Unless otherwise noted, the effective date of the regulations added or amended in 2022 is January 1, 2023.

**2022 Amendments to the 2023 Handbook 133**

<b>Chapter</b>	<b>L&amp;R Committee Item No.</b>	<b>Section</b>	<b>Action</b>	<b>Page</b>
Chapter 1. General Information	NET-19.1	Section 1.2.4. Maximum Allowable Variation	Amended	7
Chapter 1. General Information	NET-19.1	1.2.4.1. Total Quantity MAV for Multiunit and Variety Packages	Added	8
Chapter 2. Test Procedures for Packages Labeled by Weight – Gravimetric Testing	NET-19.2	Section 2.1 Scope	Note Added	13
Chapter 2. Test Procedures for Packages Labeled by Weight – Gravimetric Testing	NET-19.2	Section 2.3.71 Maximum Allowable Variation (MAV) Requirement	Note Added	25
Chapter 2. Test Procedures for Packages Labeled by Weight – Gravimetric Testing	NET-19.2	Section 2.7.3. Evaluation of Results – Compliance Determinations	Note added	41
Chapter 3. Test Procedures – For Packages Labeled by Volume	NET-19.2	Section 3.1. Scope	Note added	45
Chapter 4. Test Procedures – Packages Labeled by Count, Linear Measure, Area, Thickness, and Combinations of Quantities	NET-19.2	Section 4.1. Scope	Note added	113

Amendments and Editorial Changes to the Field Reference Manual

Chapter	L&R Committee Item No.	Section	Action	Page
Chapter 5. Specialized Test Procedures	NET-19.3	Chapter 5	Added	149 - 154
Appendix F. Glossary	NET-19.4	Multiunit package	Added	249
Appendix F. Glossary	NET-19.4	Total quantity MAV	Added	252
Appendix F. Glossary	NET-19.4	Variety package	Added	233

**2022 Editorial Changes to the 2023 Handbook 133**

Chapter	Section	Action	Page
Chapter 2. Test Procedures – Packages Labeled by Weight - Gravimetric Testing	Table 2-3 Notes	The notes were included within the content of the table as opposed to after the table.	27
Chapter 3. Test Procedures – For Packages Labeled by Volume	3.2. Gravimetric Test Procedure for Non-Viscous Liquids	Example content updated and format switched to a table layout.	47
Chapter 3. Test Procedures – For Packages Labeled by Volume	3.2. Gravimetric Test Procedure for Non-Viscous Liquids	<b>A p</b> Partial immersion thermometer (or equivalent) with a range of – 35 °C to + 50 °C (30 °F to 120 °F), at least 1 °C (12 °F) graduations, and with a tolerance of – 35 °C to + 50 °C (– 30 °F to + 120 °F) accurate to ± 1 °C (± 2 °F).	47
Chapter 3. Test Procedures – For Packages Labeled by Volume	Example for Determining Scale Suitability	Formatted and clarified example content in a table	49
Chapter 3. Test Procedures – For Packages Labeled by Volume	3.3. Volumetric Test Procedure for Non-Viscous Liquids	<b>A p</b> Partial immersion thermometer (or equivalent) with a range of – 35 °C to + 50 °C (30 °F to 120 °F), at least 1 °C (12 °F) graduations, and with a tolerance of – 35 °C to + 50 °C (– 30 °F to + 120 °F) accurate to ± 1 °C (± 2 °F).	52

Amendments and Editorial Changes to the Field Reference Manual

Chapter	Section	Action	Page
Chapter 3. Test Procedures – For Packages Labeled by Volume	3.11.1. Test Equipment	<b>A p</b> Partial immersion thermometer (or equivalent) with a <b>range of – 35 °C to + 50 °C (30 °F to 120 °F), at least 1 °C (12 °F) graduations, and with a tolerance of – 35 °C to + 50 °C (– 30 °F to + 120 °F) accurate to ± 1 °C (± 2 °F).</b>	74
Chapter 3. Test Procedures – For Packages Labeled by Volume	3.14.2.b. Stacked Firewood	Clarified calculation Width of Stack. This dimension is calculated by averaging the length of individual pieces of wood in the stack <b>and multiplying it by the number of rows.</b> <b><i>Width of Stack = Average Piece Length (APL) × Number of Rows</i></b>	92
Chapter 3. Test Procedures – For Packages Labeled by Volume	3.14.3. Field Audit Procedure – Bundled and Bagged Firewood	After the bundle or bag is secured, use a flexible measuring tape to measure the circumference near each end of the bundle or bag of firewood <b>as shown in (see Figure 3-13a. “Strapping the Ends of a Bundle”).</b> Using one movement, extend the measuring tape around the end of the bundle or bag to obtain its circumference <b>(see Figure 3-13b. “Measuring the Circumference of the Bundle”).</b>	94
Chapter 4. Test Procedures – Packages Labeled by Count, Linear Measure, Area, Thickness, and Combinations of Quantities	4.8.1.2. Audit Test Procedure	<b>Note:</b> Graph paper of an appropriate size that allows for tracing of the entire chamois shall be used. However, if a single sheet of appropriate-sized graph paper is not available, it may be necessary to tape sheets of graph paper together to create an area sufficient in size to measure the area for a chamois (e.g., chamois greater than 23.22 dm <sup>2</sup> [2.5 ft <sup>2</sup> ]).	134
Chapter 4. Test Procedures – Packages Labeled by Count, Linear Measure, Area, Thickness, and Combinations of Quantities	4.8.2.2. Test Procedure	6. Calculate the area of the rectangle cut from the pattern by multiplying the length by width and record as Area (A) in <b>square</b> centimeters or square inches.	134

Amendments and Editorial Changes to the Field Reference Manual

Chapter	Section	Action	Page
Appendix E. General Tables of Units of Measurement	Units of Capacity or Volume – Dry Volume Measure	Correct the equivalent for dry pint <b>1.12 33.600 312 5</b> cubic inches”	224
Appendix E. General Tables of Units of Measurement	General Tables of Units	<ul style="list-style-type: none"> <li>• Information was expanded to fully describe the retirement of the U.S. survey foot, including three new tables that present U.S. survey unit conversion factors in terms of the International foot. Section 2 surveying length and area tables were reformatted to align with the U.S. survey foot retirement FRN.</li> <li>• Several NIST publications, Federal Register Notices, and federal statutes and code of regulations references were updated in the footnotes. Website URLs were verified and updated.</li> <li>• Unit symbols and abbreviations were added to the “starting units” column to improve usability.</li> <li>• Removed the ångström unit to align with the latest edition of the BIPM SI Brochure and NIST SP 330, as it was eliminated in 2019.</li> <li>• Added footnote guidance for users to consult federal/state laws and regulations and industry documentary standards to confirm the barrel quantity used for a specific application.</li> </ul>	197–225
Appendix G. Table of Acronyms		<b>Added</b>	251