

California Regulations Applicable to EVSE

Adoption of NIST HB 44 with some additions and some exceptions.

Supervising Special Investigator
Matt Douglas

California Department of Food Agriculture
Division of Measurement Standards

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- Differences between NIST EPO 30 & DMS EPO 52

ACRONYMS

Business & Professions Codes, Division 5

BPC

California Code of Regulations, Title 4

4 CCR

Examination Procedure Outline

EPO

Electric Vehicle Supply Equipment

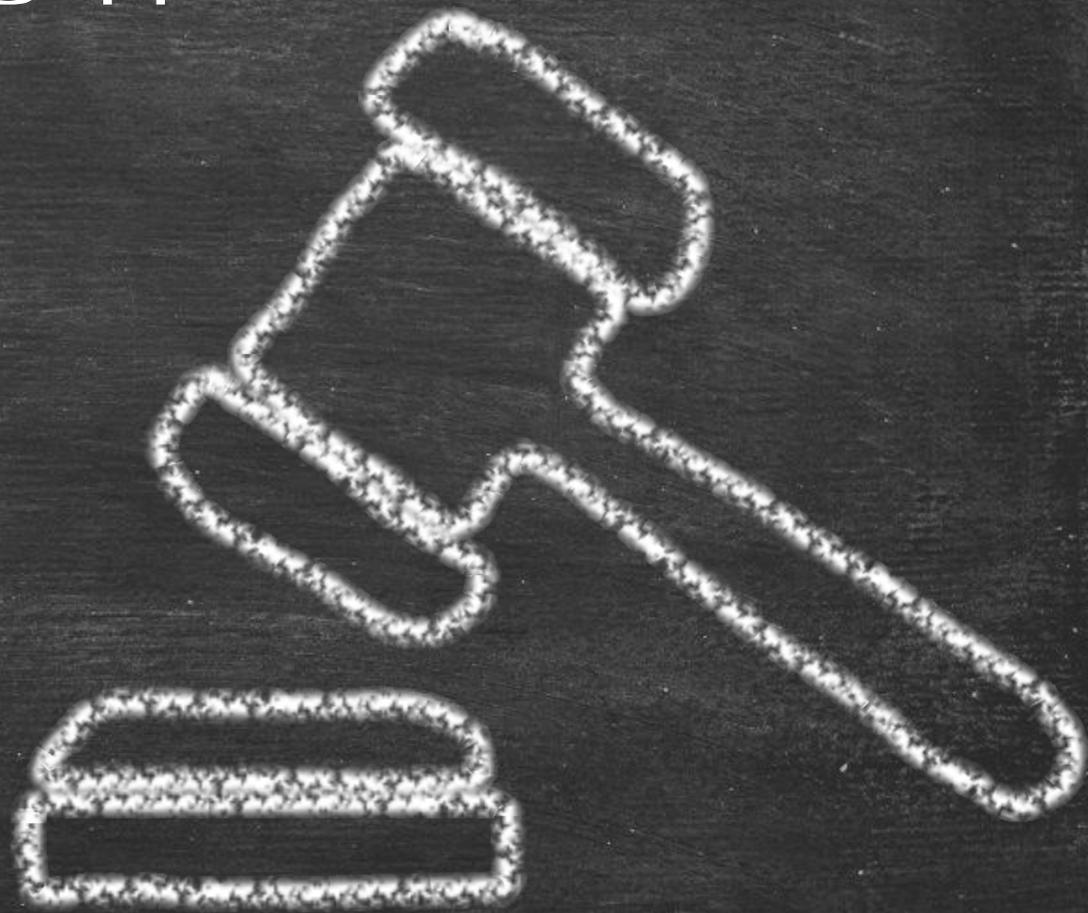
EVSE

All the following resources can be found on our CDFA-DMS Publications Page:

- California Business & Professions Code, Division 5
- California Code of Regulation, Title 4, Division 9
- Electronic Field Reference Manual
- California EPO No. 52 – Electric Vehicle Fueling Systems

<https://www.cdfa.ca.gov/dms/publications.html>

Laws and Regulations Relevant to the Adoption of NIST HB 44



<https://www.cdfa.ca.gov/dms/publications.html>

BPC Section (§) 12500 - Definitions

- Measuring Instrument
 - Any device used to measure
 - Includes accessories
- “Correct”
 - Meets all specifications and tolerances pursuant to BPC § 12107
- “Incorrect”
 - Fails to meet all requirements pursuant to BPC § 12107
- Commercial Purposes
 - Determination of...measure...of a commodity sold on the basis of measure... or upon which charge for a service is based.



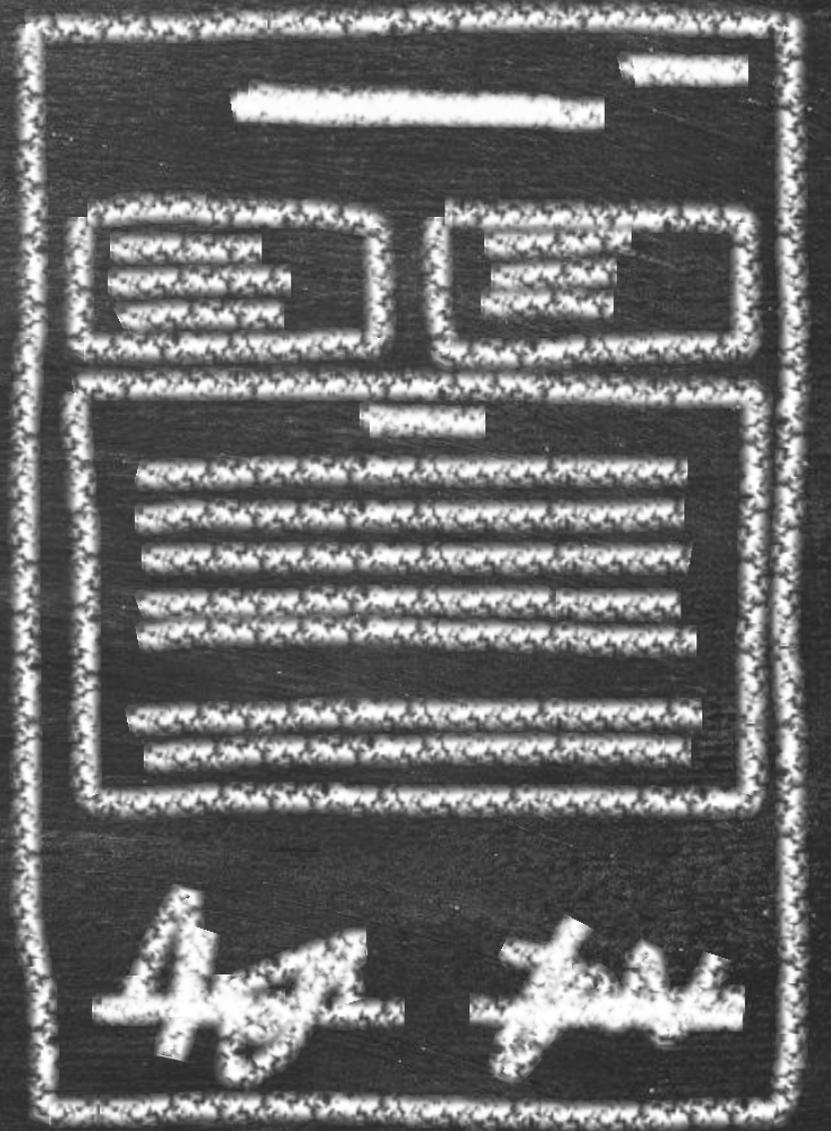
Type Evaluation

BPC § 12500.5 – CTEP Requirement

- Requires all devices used for commercial purposes to first be type evaluated by the California Type Evaluation Program (CTEP) and be issues a Certificate of Approval (COA)
- Has been effective since 1949

BPC § 12500.8 – Recognition of NTEP

- Authorizes the secretary to enter an agreement to accept National Type Evaluation Program (NTEP) Certificates of Conformance (CC)



Rulemaking Authorities

BPC § 12027 – Rulemaking authority (general)

- Authorizes the secretary to make rules and regulations as necessary for carrying out the provisions of Division 5 of the BPC.

BPC § 12107 – Adoption of NIST HB 44

- Authorizes the secretary to adopt the latest publication of National Institute of Standards and Technology (NIST) Handbook 44, with some exceptions and some additions.



Adoption of NIST HB 44 in CA

4 CCR § 4000 – NIST HB 44 as Regulation

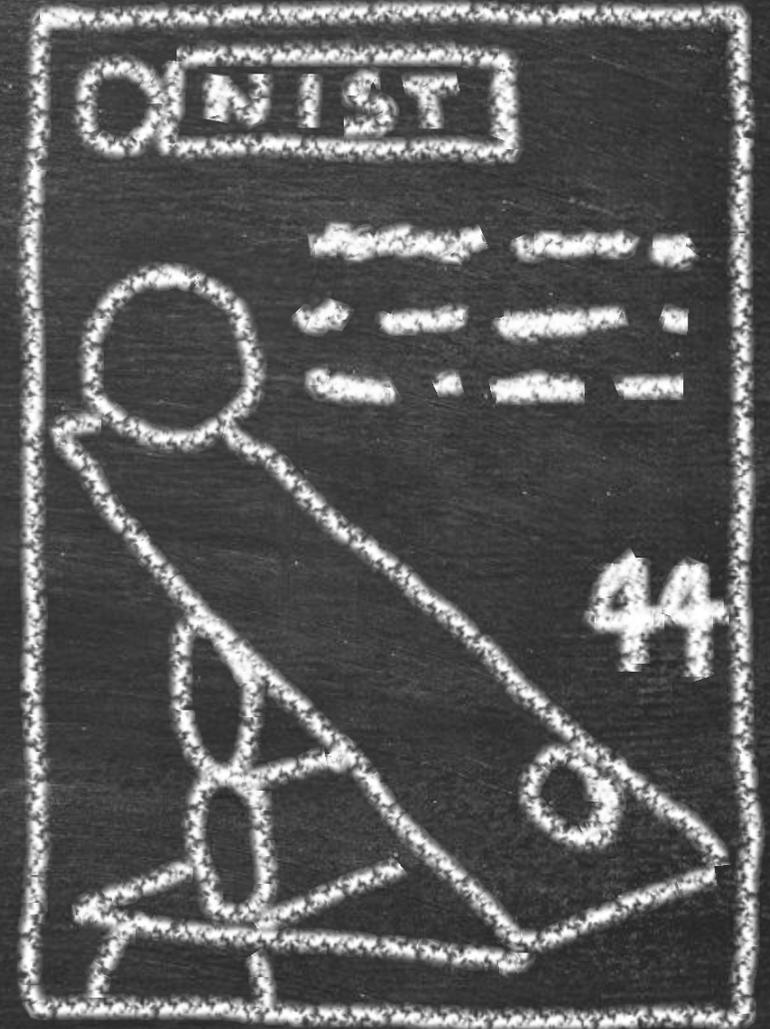
- This section is the adoption of NIST HB 44 as authorized by BPC § 12107.

4 CCR § 4001 – Exceptions from NIST HB 44

- This section identifies the portions of NIST HB 44 which are not adopted in California.

4 CCR § 4002 – Additional requirements

- This section identifies requirements in addition to those of NIST HB 44.



Adoption of NIST HB 44 as Regulation



Examples of Exceptions

4 CCR § 4001

Example 1 – Entire Section Not Adopted

4 CCR § 4001

The following regulations in Handbook 44 are not adopted or incorporated by reference:

1.10. General Code.

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

Example 1 – Entire Section Not Adopted

Language as it appears in NIST HB 44:

G-S.1.2. Devices and Main Elements Remanufactured as of January 1, 2002. – All devices and main elements remanufactured as of January 1, 2002, shall be clearly and permanently marked for the purposes of identification with the following information:

- (a) the name, initials, or trademark of the last remanufacturer or distributor; and
 - (b) the remanufacturer's or distributor's model designation, if different than the original model designation.
- (Added 2001) (Amended 2011)

Note: Definitions for “manufactured device,” “repaired device,” and “repaired element” are included (along with definitions for “remanufactured device” and “remanufactured element”) in Appendix D, Definitions.

Example 1 – Entire Section Not Adopted

Language as adopted in California:

~~**G-S.1.2. Devices and Main Elements Remanufactured as of January 1, 2002.**—All devices and main elements remanufactured as of January 1, 2002, shall be clearly and permanently marked for the purposes of identification with the following information:~~

~~(a) the name, initials, or trademark of the last remanufacturer or distributor; and~~

~~(b) the remanufacturer’s or distributor’s model designation, if different than the original model designation.~~

~~(Added 2001) (Amended 2011)~~

~~**Note:** Definitions for “manufactured device,” “repaired device,” and “repaired element” are included (along with definitions for “remanufactured device” and “remanufactured element”) in Appendix D, Definitions.~~

Because the section is identified in 4 CCR § 4001 as not adopted, it is not incorporated into 4 CCR § 4000.

Example 2 – Subsection(s) Not Adopted

4 CCR § 4001

The following regulations in Handbook 44 are not adopted or incorporated by reference:

1.10. General Code.

G-T.1. Acceptance Tolerances.

- b) equipment that has been placed in commercial service within the preceding 30 days and is being officially tested for the first time;
- c) equipment that has been returned to commercial service following official rejection for failure to conform to performance requirements and is being officially tested for the first time within 30 days after corrective service;
- d) equipment that is being officially tested for the first time within 30 days after major reconditioning or overhaul;

Example 2 – Subsection(s) Not Adopted

Language as it appears in NIST HB 44:

G-T.1. Acceptance Tolerances. – Acceptance tolerances shall apply to equipment:

- a) to be put into commercial use for the first time;
- b) that has been placed in commercial service within the preceding 30 days and is being officially tested for the first time;
- c) that has been returned to commercial service following official rejection for failure to conform to performance requirements and is being officially tested for the first time within 30 days after corrective service;
- d) that is being officially tested for the first time within 30 days after major reconditioning or overhaul; and
- e) undergoing type evaluation. (Amended 1989)

Example 2 – Subsection(s) Not Adopted

Language as adopted in California:

G-T.1. Acceptance Tolerances. – Acceptance tolerances shall apply to equipment:

- a) to be put into commercial use for the first time;
 - ~~b) that has been placed in commercial service within the preceding 30 days and is being officially tested for the first time;~~
 - ~~c) that has been returned to commercial service following official rejection for failure to conform to performance requirements and is being officially tested for the first time within 30 days after corrective service;~~
 - ~~d) that is being officially tested for the first time within 30 days after major reconditioning or overhaul; and~~
 - e) undergoing type evaluation. (Amended 1989)
-

Because specific subsections are identified in 4 CCR § 4001 as not adopted, the section is incorporated into 4 CCR § 4000 without those subsections.

Example 2 – Subsection(s) Not Adopted

Language as adopted in California:

G-T.1. Acceptance Tolerances. – Acceptance tolerances shall apply to equipment:

- a) to be put into commercial use for the first time;
 - e) undergoing type evaluation. (Amended 1989)
-

In this case, only subsections “a” and “e” of 1.10. G-T.1. Acceptance Tolerances are incorporated into 4 CCR § 4000.

Examples of Additional Requirements

4 CCR § 4002

4 CCR § 4002.11 [3.40.] A.1.1.

[Requirements in addition to those incorporated from NIST HB 44 (these sections DO NOT appear in NIST HB 44)]

AC EVSE

- All AC EVSE installed on or after January 1, 2021, are required to comply with 4 CCR, Division 9, Chapter 1, Article 1 upon installation.
- All AC EVSE installed prior to January 1, 2021, are required to comply with 4 CCR, Division 9, Chapter 1, Article 1 by January 1, 2031.

[Also see DMS Notice D-23-01 & EPO REF-A]

4 CCR § 4002.11 [3.40.] A.1.2.

[Requirements in addition to those incorporated from NIST HB 44 (these sections DO NOT appear in NIST HB 44)]

DC EVSE

- All DC EVSE installed on or after January 1, 2023, are required to comply with 4 CCR, Division 9, Chapter 1, Article 1 upon installation.
- All DC EVSE installed prior to January 1, 2023, are required to comply with 4 CCR, Division 9, Chapter 1, Article 1 by January 1, 2033.

[Also see DMS Notice D-23-01 & EPO REF-A]

Differences in [1.10.] & [3.40.]

4 CCR and NIST HB 44

4 CCR § 4001

The following regulations in Handbook 44 are not adopted or incorporated by reference:

1.10. General Code.

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

G-T.1. Acceptance Tolerances.

- (b) equipment that has been placed in commercial service within the preceding 30 days and is being officially tested for the first time;
- (c) equipment that has been returned to commercial service following official rejection for failure to conform to performance requirements and is being officially tested for the first time within 30 days after corrective service;
- (d) equipment that is being officially tested for the first time within 30 days after major reconditioning or overhaul

4 CCR § 4001

The following regulations in Handbook 44 are not adopted or incorporated by reference:

3.40. Electric Vehicle Fueling Systems

- A.4. Type Evaluation.
- S.1.3.2. EVSE Value of Smallest Unit.
- S.2.4.1. Unit Price.
- S.2.4.2. Equipment Capacity and Type of Voltage.
- S.2.7. Indication of Delivery.
- S.3.5. Temperature Range for System Components.
- S.5.2. EVSE Identification and Marking Requirements.
- N.2. Starting Load Test.
- T.2. Load Test Tolerances.
- T.2.1. EVSE Load Test Tolerances.

Appendix D. Definitions for:

- Electricity as Vehicle Fuel.
- Remanufactured Device.
- Repaired Device.
- Remanufactured Element.
- Repaired Element.

4 CCR § 4002.11

The following sections apply to devices in addition to the Handbook 44 requirements that are incorporated by reference:

3.40. Electric Vehicle Fueling Systems

- A.1.1. Effective Date for AC EVSE.
- A.1.2. Effective Dates for DC EVSE.
- A.4. Type Evaluation.
- S.1.3.2. EVSE Value of Smallest Unit.
- S.2.4.1. Unit Price.
- S.2.4.2. Equipment Capacity and Type of Voltage.
- S.2.7. Indication of Delivery.
- S.3.5. Temperature Range for System Components.
- S.5.2. EVSE Identification and Marking Requirements.
- N.2. Starting Load Test.
- T.2. Load Test Tolerances.

Appendix D. Definitions for:

- Electricity as Vehicle Fuel.

When reviewing the lists of exceptions and additions, you might notice overlap. Let's look at an example of language from NIST HB 44 and 4 CCR 4002.11 side-by-side.

3.40. Electric Vehicle Fueling Systems

- A.4. Type Evaluation.
- S.1.3.2. EVSE Value of Smallest Unit.
- S.2.4.1. Unit Price.
- S.2.4.2. Equipment Capacity and Type of Voltage.
- S.2.7. Indication of Delivery.
- S.3.5. Temperature Range for System Components.
- S.5.2. EVSE Identification and Marking Requirements.
- N.2. Starting Load Test.
- T.2. Load Test Tolerances.
- T.2.1. EVSE Load Test Tolerances.

3.40. Electric Vehicle Fueling Systems

- A.1.1. Effective Date for AC EVSE.
- A.1.2. Effective Dates for DC EVSE.
- A.4. Type Evaluation.
- S.1.3.2. EVSE Value of Smallest Unit.
- S.2.4.1. Unit Price.
- S.2.4.2. Equipment Capacity and Type of Voltage.
- S.2.7. Indication of Delivery.
- S.3.5. Temperature Range for System Components.
- S.5.2. EVSE Identification and Marking Requirements.
- N.2. Starting Load Test.
- T.2. Load Test Tolerances.

[3.40.] A.4. Type Evaluation (comparison of language)

As it appears in NIST HB 44 3.40.

Listed in 4 CCR § 4001 (NOT incorporated)

A.4. Type Evaluation.

The National Type Evaluation Program (NTEP) will accept for type evaluation only those EVSEs that comply with all requirements of this code and have received safety certification by a nationally recognized testing laboratory (NRTL).

4 CCR § 4002.11 [3.40.]

[Requirements in addition to those incorporated from NIST HB 44]

A.4. Type Evaluation.

The National Type Evaluation Program (NTEP) or California Type Evaluation Program (CTEP) will accept for type evaluation only those EVSEs that comply with all requirements of this article and have received safety certification by a nationally recognized testing laboratory (NRTL).

Any questions so far?

We will proceed with a review of the rest of the [3.40.] Code differences between NIST HB 44 & 4 CCR.

NIST HB 44 [3.40.] contains the language below in 3 places:

“All DC EVSE placed into service prior to January 1, 2025 are exempt from this requirement until January 1, 2028”

- S.2.7. – **Not incorporated into 4 CCR § 4000**
- N.3.3. – **Incorporated into 4 CCR § 4000**
 - This is a test note
 - CA has tolerances which apply to DC EVSE, this Note section is used to perform testing to verify accuracy of DC EVSE in the field.
- T.2.2. – **Not incorporated into 4 CCR § 4000**
 - **Paragraph T.2. is not adopted meaning any subparagraph is also not adopted.**
 - CA has our own tolerances for Alternating Current (AC) and Direct Current (DC) devices.

4 CCR § 4002.11 [3.40.]

S.1.3.2. EVSE Value of Smallest Unit.

The value of the smallest unit of indicated delivery by an EVSE, and recorded delivery if the EVSE is equipped to record, shall be no greater than 0.0005 MJ or 0.0001 kWh.

Note: California does not incorporate “S.1.3.2. EVSE Value of Smallest Unit” from NIST HB 44.

4 CCR § 4002.11 [3.40.]

S.2.4.1. Unit Price.

An EVSE shall be able to indicate on each face the unit price at which the EVSE is set to compute or to dispense at any point in time during a transaction. A computing EVSE shall display the unit price in whole cents (e.g., \$0.12) or tenths of one cent (e.g., \$0.119) on the basis of price per megajoule (MJ) or kilowatt-hour (kWh). In cases where the electrical energy is unlimited or free of charge, this fact shall be clearly indicated in place of the unit price.

Note: California does not incorporate “S.2.4.1. Unit Price” from NIST HB 44.

4 CCR § 4002.11 [3.40.]

S.2.4.2. Equipment Capacity and Type of Voltage.

An EVSE shall be able to conspicuously display on each face the maximum rate of energy transfer (i.e., maximum power) and the type of current associated with each unit price offered (e.g., 7 kW AC, 25 kW DC, etc.).

Note: California does not incorporate “S.2.4.2. Equipment Capacity and Type of Voltage” from NIST HB 44.

4 CCR § 4002.11 [3.40.]

S.2.7. Indication of Delivery.

The EVSE shall automatically display on its face the initial zero condition and the quantity delivered (up to the capacity of the indicating elements).

Note: California does not incorporate “S.2.7. Indication of Delivery” from NIST HB 44.

4 CCR § 4002.11 [3.40.]

S.3.5. Temperature Range for System Components.

EVSEs shall be accurate and correct over the temperature range of - 40 °C to + 85 °C (- 40 °F to 185 °F). If the system or any measuring system components are not capable of meeting these requirements, the temperature range over which the system is capable shall be stated on the National Type Evaluation Program (NTEP) Certificate of Conformance (CC) or California Type Evaluation Program (CTEP) Certificate of Approval (COA), conspicuously, legibly, and indelibly marked on the EVSE, and installations shall be limited to the narrower temperature limits.

Note: California does not incorporate “S.3.5. Temperature Range for System Components” from NIST HB 44.

4 CCR § 4002.11 [3.40.]

S.5.2. EVSE Identification and Marking Requirements.

In addition to all the marking requirements of Section 1.10. General Code, paragraph G-S.1. Identification, each EVSE shall have the following information conspicuously, legibly, and indelibly marked:

- (a) voltage rating;
- (b) maximum current deliverable;
- (c) type of current (AC or DC or, if capable of both, both shall be listed);
- (d) minimum measured quantity (MMQ); and
- (e) temperature limits, if narrower than and within - 40 °C to + 85 °C (- 40 °F to 185 °F).

Note: California does not incorporate “S.5.2. EVSE Identification and Marking Requirements” or its subparagraph “S.5.2.1. Marking of Accuracy Class, DC EVSEs Placed in Service Prior to 2025” from NIST HB 44.

4 CCR § 4002.11 [3.40.]

N.2. Starting Load Test.

A system starting load test may be conducted by applying rated voltage and 0.5-ampere load.

Note: NIST HB 44 used to contain a corresponding test note which California did not incorporate, this note has since been removed from NIST HB 44.

4 CCR § 4002.11 [3.40.]

T.2. Load Test Tolerances.

The tolerances for EVSE load tests shall be as shown in Table T.2. Accuracy Classes and Tolerances for EVSE.

Accuracy Class	Application	Acceptance Tol.	Maintenance Tol.
2.0	AC EVSE	1.0%	2.0%
5.0	DC EVSE	2.5%	5.0%
2.0	DC EVSE	1.0%	2.0%

Notes:

- California does not incorporate “T.2. Load Test Tolerances” (now titled “Accuracy Test Tolerances”) or its subparagraphs from NIST HB 44.
- DC Accuracy Class 5.0 is applicable to devices installed prior to 1/1/2033, DC Accuracy Class 2.0 is applicable to devices installed on or after 1/1/2033 – many manufacturers have type evaluations reflecting a 2.0 accuracy class, these devices are held to Accuracy Class 2.0 tolerances.

4 CCR § 4002.11 [3.40.]

Appendix D. Definitions

electricity as vehicle fuel. - Electrical energy transferred to or stored onboard an electric vehicle primarily for the purpose of propulsion. [3.40]

Note: California does not incorporate the definition of “Electricity as Vehicle Fuel” from NIST HB 44.

Differences between NIST EPO 30
&
DMS EPO 52

- EPOs are available as the minimum criteria to be used to determine compliance with applicable requirements.
- NIST EPOs are written based upon the model regulations available in NIST HB 44.
- California EPOs are written based upon the regulations as adopted in California.
- California EPO No. 52 is very similar to NIST EPO 30
 - EPO No. 52 has:
 - Removed information which is not applicable to EVSE in California, and;
 - Incorporates the additional requirements specific to EVSE in the California marketplace (as reviewed in the previous slides).

AN EPO IS NOT LAW OR REGULATION

Additional information has been added to CA EPO No. 52; an example is an explanation regarding charging statuses associated with J1772 connectors:

Charging Status Levels.

Six levels have been established in SAE J1772 based on the readiness of an electric vehicle when connected to an electric vehicle fueling system for charging the vehicle's battery system; the protocols that identify the state of readiness for charging are:

State A – Not connected or standby

State B – Cable connected, EV detected

State C – Ready for EV Charging

State D – Ready for EV Charging (ventilation required)

State E – Error, no power

State F – Fault condition

An additional example is an EPO reference document (EPO No. 52 REF-A) speaking to the applicability of requirements to EVSE based on their installation date.

SUBJECT: CLARIFICATION REGARDING EFFECTIVE DATES, 4 CCR SECTION 4002.11

AC EVFS installed prior to January 1, 2021, and DC EVFS installed prior to January 1, 2023, should not be inspected or tested unless based upon information received, such as a written request as described in BPC Section 12503; until - for AC EVFS January 1, 2031, and for DC EVFS January 1, 2033. In these situations, specifications and tolerances cannot be applied, however counties may exercise applicable code sections including Business and Professions Code Section 12024.2 (a)(1) regarding charging an amount greater than the price, or computing an amount greater than a true extension of a price per unit, that is then advertised, posted, marked, displayed, or quoted for that commodity.

Should an AC EVFS installed prior to January 1, 2021, or a DC EVFS installed prior to January 1, 2023, be replaced, the newly installed EVFS is subject to all applicable laws and regulations.

Also see DMS Notice D-23-01.

All the following resources can be found on our CDFA-DMS Publications Page:

- California Business & Professions Code, Division 5
 - California Code of Regulation, Title 4, Division 9
 - Electronic Field Reference Manual
 - California EPO No. 52 – Electric Vehicle Fueling Systems
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<https://www.cdfa.ca.gov/dms/publications.html>

Thank you, NCWM!

Matthew Douglas
Supervising Special Investigator
Device Enforcement
(714) 904 – 5309
Matthew.Douglas@cdfa.ca.gov

For more information about our programs, please visit:
<https://www.cdfa.ca.gov/dms>