

EVF-23.6: A PROPOSED REVISION AND PATH FORWARD

A Brief History

- **2015** - Tentative code for EV chargers, with a tolerance of 1% / 2% that was aspirational for DC chargers.
 - Users pushed manufacturers to develop DC fast chargers with that level of metrology as fast as possible.
- **2019** - California regulations with a 2.5% / 5% tolerance for DC chargers, because 1% / 2% was not immediately achievable.
- **2022** - A NIST subcommittee considered a proposal to allow the 5% tolerance for legacy chargers.
 - Among regulators, users, and manufacturers, the overall conclusion was that the date for “legacy” should be the start of 2024; the legacy chargers should be marked as such; and the legacy chargers should be allowed to continue through 2033.
- **2023** - NCWM voted on EVF-23.6.
 - Just before the vote, a floor amendment was proposed to alter the marking requirement. That amendment did not pass; then on EVF-23.6, the vote was 27-12 among state representatives and 30-36 among delegates.

Revised Marking Requirement to Address Feedback

EXISTING EVF-23.6

S.5.2.1. Marking of Accuracy Limits, DC EVSEs Installed Prior to 2024. - A DC EVSE installed and placed into service prior to 2024 shall be marked with the following:

- NOTICE: "This charger operates at a tolerance of up to +/- 5 percent versus other chargers which operate at a maximum tolerance of up to +/- 2 percent."

This marking shall be conspicuously and legibly displayed in a position plainly visible to a person accessing a charging port of the EVSE. The indicating element may be used to display this notice, provided the notice is presented to the customer prior to the beginning of the transaction. This marking requirement does not apply to DC EVSEs that are capable of meeting an acceptance tolerance of +/- 1 percent and a maintenance tolerance of +/- 2 percent.

• REQUESTED AMENDMENT

S.5.2.1. Marking of Accuracy **Class**, DC EVSEs **Placed in Service** Prior to 2024. - A DC EVSE that was **placed into service** prior to 2024 and is subject to the tolerances of T.2.2(a) **is an accuracy Class 5 EVSE, and shall be marked with Class 5.**

The marking shall be conspicuously and legibly displayed in a position plainly visible to a person accessing a charging port of the EVSE. The indicating element may be used for the marking, provided the marking is visible to the customer prior to the beginning of the transaction.

(Added 202X)

Precedents for the Revised Marking Requirement

Q: What is the definition of “Class 5”?

A: *Throughout Handbook 44, accuracy classes are defined simply by stating the applicable tolerances or other requirements.*

Examples: Belt-Conveyor Scales, § 2.21 ¶ S.5: “Belt-conveyor scale systems and weigh-belt systems shall be marked with the following: * * * (f) the accuracy classification as declared by the manufacturer.”

¶ T.1: “Maintenance and acceptance tolerances on material tests, relative to the weight of the material, shall be:
± 0.25 % of the test load for systems not marked with an accuracy class;
± 0.25 % of the test load for systems marked Class 0.25;
and
± 0.1 % of the test load for systems marked Class 0.1.”

Hydrogen Gas-Measuring Devices, § 3.39 ¶ S.5: “A measuring system shall be . . . marked with the following information: * * * (e) the accuracy class of the device . . . consistent with Table T.2. Accuracy Classes and Tolerances for Hydrogen-Gas Measuring Devices.

¶ T.2: “The tolerances for hydrogen gas measuring devices are listed in Table T.2. Accuracy Classes and Tolerances for Hydrogen Gas-Measuring Devices.” (There is only one class in the table, 7.0.)

OIML Guide G 22, § 3.31: “The manufacturer shall specify the accuracy class of the EVSE to be one of A, B or C. The EVSE shall be designed and manufactured such that its error does not exceed the maximum permissible error for the specified class”

Q: Should there be a Class 2?

A: *Handbook 44 sometimes specifies requirements in parallel for a given accuracy class and for unclassified devices.*

Examples: Weigh-in-Motion Scales, § 2.25 ¶ S.4.1: “Weigh-in-motion systems meeting the requirements of this code shall be designated as accuracy Class A.”

Scales, § 2.20 ¶ T.1.1: “The tolerances applicable to devices not marked with an accuracy class shall have the tolerances applied as specified in Table T.1.1. Tolerances for Unmarked Scales.”

Comparison to proposed EVF-23.6 revision:

¶ S.5.2.1: “A DC EVSE that was placed into service prior to 2024 and is subject to the tolerances of T.2.2(a) is an accuracy Class 5 EVSE, and shall be marked with Class 5.”

Q: Will inspectors and customers know what Class 5 means?

A: *An inspector seeing a Class 5 marking will know the consequences from Handbook 44. An agency receiving a customer complaint will be able to ask the customer to check if there was a Class 5 marking.*

Simplifying the Statement of Tolerance

EXISTING EVF-23.6

T.2.2 EVSE Accuracy Test Tolerances for DC Systems. -- The tolerances for EVSE load tests on DC systems shall be as follows:

- a) For DC systems installed and placed in service prior to January 1, 2024, and that bear the notice specified in paragraph S.5.2.1. Marking of Accuracy Limits, DC EVSEs installed and placed in service prior to 2024, acceptance and maintenance tolerances are: 5.0 percent. This paragraph T.2.2(a) shall expire on January 1, 2034; after that date, all DC EVSEs shall be subject to the tolerances of paragraph T.2.2(b).
- b) For DC systems installed and placed in service on or after January 1, 2024, or that do not bear the notice specified in paragraph S.5.2.1. Marking of Accuracy Limits, DC EVSEs installed and placed in service prior to 2024 tolerances are:
 - (1) Acceptance Tolerance: 1.0 percent; and
 - (2) Maintenance Tolerance: 2.0 percent.

All DC EVSE are exempt from this requirement paragraph T.2.2 until January 1, 2028.

REQUESTED AMENDMENT

T.2.2 EVSE Accuracy Test Tolerances for DC Systems. -- The tolerances for EVSE load tests on DC systems shall be as follows:

- (a) For a DC system **that was** placed in service prior to January 1, 2024, **and that is marked Class 5**, acceptance and maintenance tolerances are: 5.0%. This paragraph T.2.2(a) shall expire on January 1, 2034; after that date, all DC EVSEs shall be subject to the tolerances of paragraph T.2.2(b).
- (b) For any DC system not subject to paragraph T.2.2(a), tolerances are:
 - (1) Acceptance Tolerance: 1.0 %; and
 - (2) Maintenance Tolerance: 2.0 %.

- All DC EVSE are exempt from **this requirement** until January 1, 2028.

Simplifying the Statement of Tolerance

Q: Will every DC charger fall under one or the other of the tolerance provisions?

A: *Yes. To qualify for the 5% tolerance, a charger must meet the prerequisites of clause (a). All other DC systems would be subject to clause (b).*

(b) For any DC system not subject to paragraph T.2.2(a), tolerances are:

(1) Acceptance Tolerance: 1.0 %; and

(2) Maintenance Tolerance: 2.0 %.

Q: Why the revision to the “exemption” sentence?

A: *The proposed revision is to remove the reference to paragraph T.2.2 because it is unnecessary and the existing text provides clarity. This more closely aligns with how Handbook 44 is written.*

Q: Why delete “installed”?

A: *A charger could be “installed” and not yet “placed in service.” “Installed” by itself could have allowed chargers to qualify for the 5% tolerance even though they were not in use before 2024. The other way around is not possible. A charger cannot be “placed in service” without being “installed” beforehand. So “placed in service” is a sufficient criterion.*

EVF-23.6 WITH THE REQUESTED REVISION

T.2. Test Tolerances.

T.2.1. EVSE Load ~~Accuracy~~ Test Tolerances for AC Systems. – The tolerances for EVSE load tests for AC systems are:

- (a) Acceptance Tolerance: 1.0 %; and
- (b) Maintenance Tolerance: 2.0 %.

T.2.2 EVSE Accuracy Test Tolerances for DC Systems. -- The tolerances for EVSE load tests on DC systems shall be as follows:

(a) For a DC system that was placed in service prior to January 1, 2024, and that is marked Class 5, acceptance and maintenance tolerances are: 5.0 %. This paragraph T.2.2(a) shall expire on January 1, 2034; after that date, all DC EVSEs shall be subject to the tolerances of paragraph T.2.2(b).

(b) For any DC system not subject to paragraph T.2.2(a), tolerances are:

- (1) Acceptance Tolerance: 1.0 %; and**
- (2) Maintenance Tolerance: 2.0 %.**

All DC EVSE are exempt from this requirement until January 1, 2028.

EVF-23.6 WITH THE REQUESTED REVISION

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~~ **permanently** 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).

S.5.2.1. Marking of Accuracy Class, DC EVSEs Placed in Service Prior to 2024. - A DC EVSE that was placed into service prior to 2024 and is subject to the tolerances of T.2.2(a) is an accuracy Class 5 EVSE, and shall be marked with Class 5.

The marking shall be conspicuously and legibly displayed in a position plainly visible to a person accessing a charging port of the EVSE. The indicating element may be used for the marking, provided the marking is visible to the customer prior to the beginning of the transaction.

(Added 202X)