



**ESS Installations in
Residential Projects with Spacing less than 3'-0"
(2022 CFC Chapter 12, NFPA 855)
Effective Date: 1/22/2024**

All Energy Storage Systems (ESS) installations associated with residential occupancies (R-3 single-family residences) shall have a minimum 3'-0" spacing between individual units. The 2022 CFC Section 1207.11.2.1 indicates that units with less than 3'-0" spacing shall conduct large-scale testing complying with Section 1207.1.5. The challenge is that large-scale testing as referenced in Section 1207.1.5 is inconsistent with industry standard NFPA 855, which indicates large-scale testing induces a significant fire into the device under test and evaluates whether the fire will spread to the adjacent ESS unit. The San Jose Fire Department has determined that **thermal runaway testing is not equivalent to large-scale fire testing.**

2022 CFC 1207.1.5 Large-Scale Fire Test

Where required elsewhere in Section 1207, large-scale fire testing shall be conducted on a representative ESS in accordance with UL 9540A. The testing shall be conducted or witnessed and reported by an approved testing laboratory and show that a fire involving one ESS will not propagate to an adjacent ESS, and where installed within buildings, enclosed areas, and walk-in units will be contained within the room, enclosed area or walk-in unit for a duration equal to the fire-resistance rating of the room separation specified in Section 1207.7.4. The test report shall be provided to the fire code official for review and approval in accordance with Section 104.8.2.

2021 ICC Fire Code Commentary

This section provides the details required if testing of new and innovative approaches to ESS are used. This is based on large-scale fire and fault condition testing with specific criteria for success and failure. The UL 9540A Test Method was specifically developed to cover this testing. Since extinguishment of a fire involving a thermal runaway in an ESS is extremely difficult, if not impossible, the code requirements are based on the concept of an ESS unit being completely consumed by fire without propagating to an adjacent ESS unit. A large-scale fire test is essential to documenting that unit-to-unit propagation will not occur as well as generating additional data for necessary risk assessments for varied installation locations and arrangements relative to exposures.

Nowhere in the UL 9540A's testing criteria does it indicate that significant fire is induced into the device. Current UL 9540A tests appear to be unit-level tests without fire inducement, which is not consistent with the NFPA 855 Large-Scale Fire Testing definition. Testing companies are pushing a couple of cells into thermal runaway and if they don't propagate or have a fire event, they terminate the test and pass the system. The CFC and NFPA 855 assume the fire occurred and demand the data from such a fire to document there will be no unit-to-unit propagation.

Depending on the type of battery chemistry used, deviating from the prescribed method in UL 9540A may be necessary to create a fire in the test enclosure. A large-scale fire test aims to fulfill the limitations of UL 9540A and provide additional data regarding what might happen if a system were to fail at a project site as well as ensure the safety features designed into the system function as intended.

All previously approved master files allowing limited spacing are suspended unless test results indicate fire inducement and tests are conducted to provide complete consumption by fire without propagation to adjacent ESS. Manufacturers who intend to install an ESS in a residential setting exceeding the limitations as set by CRC 2022 R328.3.1 and R328.5 are requested to comply with the current requirements of 2022 CFC Chapter 12 and submit documentation required as follows:

1. Submit an installation plan, specification, and testing reports for Fire review in addition to requirements as set by building department bulleting #282.
[SOLAR PHOTOVOLTAIC & STATIONARY STORAGE BATTERY INSTALLATIONS](#)
2. Provide UL listing for ESS products.
3. Provide individual and aggregate rating ESS product ratings.
4. Provide Large-Scale fire test documentation for the reduced spacing proposed.