

UNDER EAVE
SFM STANDARD 12-7A-3

12-7A-3.1 Application. The minimum design, construction and performance standards set forth herein for exterior wall eaves are those deemed necessary to establish conformance to the provisions of these regulations. Materials and assemblies that meet the performance criteria of this standard are acceptable for use in Very High Fire Hazard Zones as defined in California Building Code, Chapter 7A.

12-7A-3.2 Scope. This standard determines the performance of eaves of exterior walls of structures when exposed to direct flames.

12-7A-3.3 Referenced documents.

1. ASTM D4444. Standard Test Methods for Use and Calibration of Hand-Held Moisture Meters
2. California Building Code, Chapter 7A.

12-7A-3.4 Definitions.

1. **Eaves.** A projecting edge of a roof that extends beyond the supporting wall.
2. **Soffit.** The enclosed underside of any exterior overhanging section of a roof eave.

12-7A-3.5 Equipment.

1. **Burner.** A 4 × 39 inch (100 × 1000 mm) propane diffusion burner shall be used.
2. **Infrared temperature analyzer (optional).** Intended for monitoring the temperature change of the inside of the eaves.
3. **Moisture meter.** For measurement of moisture content of framing (see ASTM D4444).

12-7A-3.6 Materials.

1. **Framing.** The materials used shall be representative of the grades that would be typical of eave construction and installed in the eaves subassembly as per accepted construction practices.
2. **Soffit.** Material selected for the test.

12-7A-3.7 Test System Preparation (Figure 12-7A-3-1).

1. **Eaves fabrication.** The assembly shall be constructed to fit into a 4-ft (1.2 m) wide space in the wall module. Normal roof framing, joints in soffit material and other typical features present in the constructed assembly shall be present in the test specimen.
2. **Wall Module.** The module shall be designed to permit rapid installation and removal of eave assemblies and have two adjustable noncombustible sidewalls.
3. **Eaves assembly.** Fit the eave assembly into the wall module so that the lowest point of the assembly is 82 inches (2.1 m) from the top of the burner.

4. **Moisture content.** Measure the moisture content of the wooden members of the assembly using a moisture meter (D 4444).
5. **Sealing.** Seal the edges and ends with ceramic wool or comparable material to prevent flame penetration in these locations of the eave assembly.
6. **Finish.** The eaves shall be finished in a manner appropriate for exterior exposure as per accepted construction practices.

12-7A-3.8 Conduct of Tests.

1. **Airflow.** The wall test shall be conducted under conditions of ambient airflow.
2. **Number of tests.** Conduct the tests on three replicate eaves assemblies.
3. **Burner output verification.** Without the eaves assembly in place, adjust the burner for 300 ± 15 kW output. Extinguish the burner.
4. **Burner configuration.** Center the burner with respect to the width of the eaves wall assembly and 0.75 inch (20 mm) from the wall. The distance from the floor to the top of the burner shall be 12 inches (300 mm).
5. **Procedure.**
 - 5.1 Ignite the burner, controlling for a constant 300 ± 15 kW output.
 - 5.2 Continue the exposure until flame penetration of the eaves occurs or for a 10-minute period.
 - 5.3 If penetration does not occur, continue observation for an additional 30 minutes or until all combustion has ceased. An infrared thermometer has been found to be useful to detect the increase of temperature on the back side of the eaves and as an aid to identify the areas of potential combustion.
6. **Observations.** Note the time, location and nature of flame penetration.

12-7A-3.9 Report. The report shall include a description of the eaves material, details of the construction of the eaves, moisture content of the framing, and point of flame penetration. Provide details on the time and reasons for early termination of the test.

12-7A-3.10 Conditions of Acceptance. Should one of the three replicates fail to meet the Conditions of Acceptance, three additional tests may be run. All of the additional tests must meet the Conditions of Acceptance.

1. Absence of flame penetration of the eaves at any time.
2. Absence of structural failure of the eaves subassembly at any time.
3. Absence of sustained combustion of any kind at the conclusion of the 40-minute test.

