



UL 790

STANDARD FOR SAFETY

Standard Test Methods for Fire Tests of Roof Coverings

UL Standard for Safety for Standard Test Methods for Fire Tests of Roof Coverings, UL 790

Ninth Edition, Dated February 18, 2022

Summary of Topics

This new edition of ANSI/UL 790 dated February 18, 2022 includes the following changes in requirements:

- ***Listing of Test Methods in Scope; [1.1](#)***
- ***Update of Scope and Roof Deck Clarification; [1.2](#), [1.4](#)***
- ***Class B Burning Brand Test Modifications; [Table 3.1](#), [8.4.2.1](#)***
- ***[Figure 4.1](#) Title Change and Editorial Corrections; [4.2.1](#), [4.2.2](#)***
- ***Roof Coverings Clarification; [4.2.3](#), [4.2.4](#)***
- ***Burning Brand Deck Clarification; [4.2.5](#)***
- ***Spread-of-Flame Test Deck Clarification; [4.3.1](#)***
- ***Clarification to [4.4.1](#)***
- ***Thermocouple Stabilization for Calibration; [5.5](#)***
- ***Intermittent-Flame Test Air Supply; [6.1](#)***
- ***Ignition of Brands Timing; [8.3.1](#)***
- ***Flying-Brand Test Air Current Clarity; [9.3](#)***

The new and revised requirements are substantially in accordance with Proposal(s) on this subject dated October 1, 2021.

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UL 790

Standard for Standard Test Methods for Fire Tests of Roof Coverings

The first through seventh editions were titled Tests for Fire Resistance of Roof Covering Materials.

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Ninth Edition

February 18, 2022

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The most recent designation of ANSI/UL 790 as an American National Standard (ANSI) occurred on February 18, 2022. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page.

The Department of Defense (DoD) has adopted UL 790 on March 21, 1984. The publication of revised pages or a new edition of this Standard will not invalidate the DoD adoption.

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INTRODUCTION

1 Scope

1.1 These requirements cover the measurement of the relative fire characteristics of roof coverings exposed to simulated fire sources originating from outside a building on which the coverings are installed. They are applicable to roof coverings intended for installation on either combustible or noncombustible roof decks (see [1.4](#)) when the roof coverings are applied as intended. The following test methods are included:

- a) Intermittent-Flame Exposure test;
- b) Spread of Flame test;
- c) Burning Brand test;
- d) Flying Brand test; and
- e) Rain test.

1.2 Three classes of fire exposure are described.

- a) Class A roof coverings that are expected to be effective against severe fire exposures. Under such exposures, roof coverings of this class afford a high degree of fire protection to the roof deck, do not slip from position, and are not expected to produce flying brand.
- b) Class B roof coverings that are expected to be effective against moderate fire exposures. Under such exposures, roof coverings of this class afford a moderate degree of fire protection to the roof deck, do not slip from position, and are not expected to produce flying brand.
- c) Class C roof coverings that are expected to be effective against light fire exposures. Under such exposures, roof coverings of this class afford a light degree of fire protection to the roof deck, do not slip from position, and are not expected to produce flying brand.

1.3 Tests conducted in accordance with these requirements are intended to demonstrate the performance of roof coverings during the types and periods of fire exposure involved, but are not intended to determine the acceptability of roof coverings for use after exposure to fire. These fire test methods do not provide a basis to compare expected performance under all actual fire conditions but they do provide a basis for comparison of the response of roof coverings when subjected to fire sources that are described herein.

1.4 These test methods address roof coverings used over both combustible and noncombustible decks. A combustible deck is generally constructed using materials that do not comply with the requirements of ASTM E136, such as wood sheathing boards, oriented strand boards (OSB), or plywood. A noncombustible deck is generally constructed entirely of materials that comply with the requirements of ASTM E136, such as metal, concrete, or poured gypsum.

2 Units of Measurement

2.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

PERFORMANCE

3 General

3.1 Representative samples of a roof covering material, assembled to test decks as described in Section 4, are to be subjected to the applicable tests described in Sections 6 – 11 as specified in Table 3.1.

Table 3.1
Required Tests and Test Assemblies

Material to be tested	Required number of test assemblies ^a					
	Intermittent-flame test, Section 6	Spread-of-flame test, Section 7	Burning-brand test, Section 8	Flying-brand test, Section 9	Rain test, Section 10	Weathering test, Section 11
Other than wood shakes or shingles, for installation on:						
A. Combustible decks:						
1. Class A	2	2	4	NA	NA	NA
2. Class B or C	2	2	2 (4) ^c	NA	NA	NA
B. Noncombustible decks only	NA	2	NA	NA	NA	NA
Wood shakes and shingles ^b :						
A. Class A	3 (2) [5]	3	6 (2) [5]	3 (2) [5]	6	15
B. Class B or C	3 (2) [5]	3	3 (2) [5]	3 (2) [5]	6	15

^a NA – Test is not required.

^b Number in parentheses is number of samples from Rain Test, Section 10, to be tested. Number in brackets is number of samples from Weathering Test, Section 11, to be tested.

^c Number in parentheses is number of samples for Class B burning brand tests to be tested, when conducted on Class A burning brand decks as described in 8.4.2.1, Exception.

4 Preparation of Samples

4.1 General

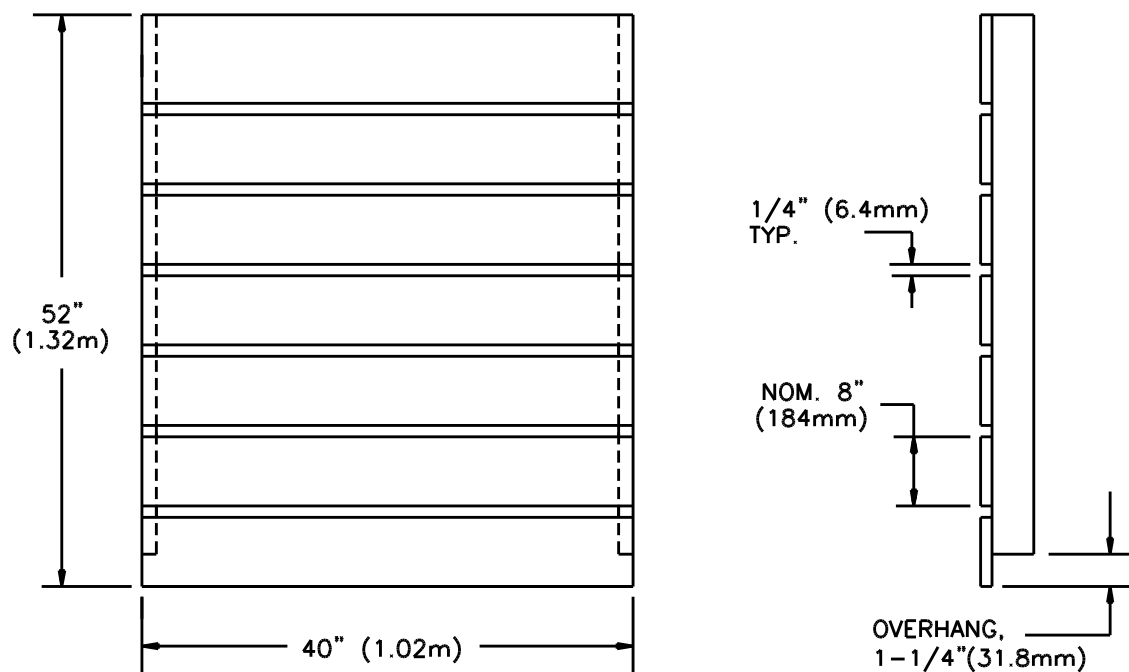
4.1.1 Representative samples of a roof covering material are to be applied, as described in 4.4, to test decks constructed in accordance with the applicable requirements of 4.2.1 – 4.3.2. The assemblies are to be conditioned in accordance with 4.4 prior to testing.

4.2 Intermittent-flame, burning-brand, and flying-brand test decks

4.2.1 Except as indicated in 4.2.2 – 4.2.5, the test deck for the Intermittent-Flame Test, Section 6, and the Burning-Brand Test, Section 8, is to be 3-1/3 feet (1.0 m) wide by 4-1/3 feet (1.3 m) long and is to be made of kiln-dried No. 1 white pine lumber with not less than 8 nor more than 12 percent moisture content. The lumber is to be free from large or loose knots, sapwood, rot, or pitch pockets, and is to contain no edge knots. Individual deck boards are to be of nominal 1 by 8 inch (19.1 by 184 mm) lumber (dressed on four sides). If used for the Class C burning brand test, see 8.4.3.1 – 8.4.5.1, the width of the deck board is to be such that the brands will be located directly over the spaces between the boards. The deck boards are to be laid across the shorter dimension of the test deck, spaced 1/4 inch (6.4 mm) apart, and securely nailed to two nominal 2 by 4 inch (38 by 89 mm) wood battens located under and flush with the outer edges of the deck. Decks so constructed are to be even and uniform. Figure 4.1 and Figure 4.2 illustrate the construction details of these decks.

Figure 4.1

Class A, B, and C Intermittent-Flame and Class A and B Burning-Brand Pine Board Deck



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