



Standard Specification for Wood to Be Used as Panels in Weathering Tests of Coatings¹

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This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This specification designates woods for weathering tests of exterior solvent-borne or water-borne paints and other materials of similar purpose. Such tests may include either outdoor exposure tests or accelerated laboratory tests. It is the purpose of this specification to minimize the influence of variation of wood of a given species on test results.

1.2 The values stated in inch/pound units are to be regarded as the standard. The values given in parentheses are for information only.

2. Referenced Documents

2.1 ASTM Standards:

D 3924 Specification for Standard Environment for Conditioning and Testing Paint, Varnish, Lacquers, and Related Materials²

3. General Considerations

3.1 A variety of different species should be used for testing finishes because of the wide variations in the anatomy and the density between wood species. The factors have tremendous influences on finish performance. Latewood band width and density are especially important to finish performance, and these parameters vary significantly between wood species. Cedar and redwood have relatively low proportions of hard summerwood distributed in narrow bands and contain extractives that discolor some paint films. Southern pine has a large proportion of hard summerwood in wide bands.

3.2 The angle between the growth rings and the surface of the specimen is very critical to finish performance. Commercial practice utilizes the following classification system. Boards in which growth form an angle of less than 30° with the wide surface of the piece are said to be flat-sawn or flat-grained; those with the rings intersecting at angles between 30° and 60° are termed bastard-sawn; and those with angles greater than 60° are termed quarter-sawn, edge grain, or vertical grain.

¹ This specification is under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility D01.52on Factory-Coated Wood Products.

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² Annual Book of ASTM Standards, Vol 06.01.

3.3 Some industrial processors of wood products may utilize wood at moisture levels significantly higher than the equilibrium moistures cited in this specification. In these specific cases, appropriately higher moisture content panels may be prepared for testing of factory applied finishes.

WESTERN RED CEDAR

4. Species

4.1 The material for test panels shall be western red cedar (*Thuja plicata*).

5. Weight per Volume

5.1 When the wood is in equilibrium with air at 60 to 65 % relative humidity and 70 ± 1°F (21 ± 0.5°C) it shall weigh 22 to 23 lb/ft³ (350 to 370 kg/m³) or at 50 ± 5 % relative humidity and 73.5 ± 3.5°F (23 ± 2°C), which are specified in Specification D 3924 as standard conditions for testing paint and related coatings, it shall weigh 21.4 to 22.4 lb/ft³ (343 to 359 kg/m³).

NOTE 1—The density requirement is to eliminate wood specimens that vary greatly from the average for that species. Either set of conditions may be used to establish the density. At 60 to 65 % relative humidity wood has a moisture content of approximately 12 % while at 45 to 55 % relative humidity it contains 9 to 10 %. The former is closer to the moisture content of wood exposed to most exterior climatic conditions.

6. Character of Wood

6.1 The wood shall be heartwood having edge grain and shall be free of knots and other defects. The color of the wood shall be uniform across each panel with no streaks that are excessively light or dark. The number of annual growth rings per inch along the radius of the log from which the wood was obtained shall not be less than ten. The surfaces shall be smoothly planed and sanded thoroughly with 150 grit sandpaper within two weeks of testing.

7. Thickness of Panels

7.1 The minimum thicknesses (Note 2) in proportion to width (across the grain) shall be as follows:

Panel Width, in. (mm)	Minimum Thickness, in. (mm)

Less than 3 (less than 75)	3/8(10)
3 to 6 (75 to 150)	7/16 (11)
Over 6 (over 150)	3/4 (19)

NOTE 2—Minimum thicknesses in proportion to width (across the grain) do not apply to panels made of clapboard or siding of commercial types, which shall be used as regularly marketed.

WHITE PINE AND PONDEROSA PINE

8. Species

8.1 White pine wood shall be northern white pine (*Pinus strobus*). Western white pine (*Pinus monticola*), or sugar pine (*Pinus lambertiana*). Western white pine is sometimes called Idaho white pine. Ponderosa pine wood shall be *Pinus ponderosa*.

9. Weight per Volume

9.1 When the wood is in equilibrium with air at 60 to 65 % relative humidity and 70 ± 1°F (21 ± 0.5°C) it shall weigh 23 to 27 lb/ft³ (370 to 430 kg/m³) or at 50 ± 5 % relative humidity and 73.5 ± 3.5°F (23 ± 2°C) it shall weigh 22.4 to 26.4 lb/ft³ (359 to 423 kg/m³). (See Note 1.)

10. Character of Wood

10.1 The wood shall be free of knots, pitch pockets, and other defects. The color of the wood shall be uniform across each panel with no streaks that are excessively light or dark. The number of annual growth rings per inch along the radius of the log from which the wood was obtained shall be not less than 15. The surfaces shall be smoothly planed and sanded thoroughly with 150 grit sandpaper within two weeks of testing.

10.2 The wood shall be selected as edge grain or flat grain as desired. The test surface of flat grain wood shall be on the bark side.

11. Thickness of Panels

11.1 The minimum thicknesses (see Note 3) in proportion to width (across the grain) shall be as follows:

Panel Width, in. (mm)	Minimum Thickness, in. (mm)
Less than 3 (less than 75)	7/16(11)
3 to 6 (75 to 150)	7/16 (11)
Over 6 (over 150)	3/4 (19)

SOUTHERN PINE

12. Species

12.1 The material for test panels shall be southern pine (*Pinus sp.*), suitable for siding purposes. It is not to be limited to a single species, but shall conform to the requirements prescribed in Sections 13 and 14.

13. Weight per Volume

13.1 When the wood is in equilibrium with air at 60 to 65 % relative humidity and 70 ± 1°F (21 ± 0.5°C) it shall weigh 32 to 38 lb/ft³ (510 to 610 kg/m³) or at 50 ± 5 % relative humidity and 73.5 ± 3.5°F (23 ± 2°C) it shall weigh 31 to 37 lb/ft³ (500 to 590 kg/m³). (See Note 2.)

14. Character of Wood

14.1 The wood shall be free of knots, pitch pockets, and

other defects. The color of the wood shall be uniform across each panel with no streaks that are excessively light or dark. The number of annual growth rings per inch along the radius of the log from which the wood was obtained shall be not less than 4 nor more than 12. The surfaces shall be smoothly planed and sanded thoroughly with 150 grit sandpaper within two weeks of testing.

14.2 The wood shall be sapwood having flat grain.

15. Thickness of Panels

15.1 The minimum thicknesses (see Note 3) in proportion to width (across the grain) shall be as follows:

Panel Width, in. (mm)	Minimum Thickness, in. (mm)
Less than 3 (less than 75)	7/16(11)
3 to 6 (75 to 150)	7/16 (11)
Over 6 (over 150)	3/4 (19)

REDWOOD

16. Species

16.1 The material for test panels shall be redwood (*Sequoia sempervirens*).

17. Weight per Volume

17.1 When the wood is in equilibrium with air at 60 to 65 % relative humidity and 70 ± 1°F (21 ± 0.5°C) it shall weigh 28 to 29 lb/ft³ (450 to 460 kg/m³) or at 50 ± 5 % relative humidity and 73.5 ± 3.5°F (23 ± 2°C) it shall weigh 27.2 to 28.2 lb/ft³ (436 to 452 kg/m³). (See Note 1.)

18. Character of Wood

18.1 The material shall be heartwood, as nearly edge grain as possible. The number of annual growth rings per inch along the radius of the log from which the wood was obtained shall be not less than 18. The wood shall be free of knots, oil streaks, and other defects such as wavy burl grain. The color of the wood shall be uniform across each panel with no streaks that are excessively light or dark. The surfaces shall be smoothly planed and sanded thoroughly with 150 grit sandpaper within two weeks of testing.

19. Thickness of Panels

19.1 The minimum thicknesses (see Note 2) in proportion to width (across the grain) shall be as follows:

Panel Width, in. (mm)	Minimum Thickness, in. (mm)
Less than 3 (less than 75)	3/8(10)
3 to 6 (75 to 150)	7/16 (11)
Over 6 (over 150)	3/4 (19)

DOUGLAS FIR

20. Species

20.1 The material for test panels shall be Douglas fir (*Pseudotsuga menziesii*).

21. Weight per Volume

21.1 When the wood is in equilibrium with air at 60 to 65 % relative humidity and 70 ± 1°F (21 ± 0.5°C) it shall weigh 30

to 36 lb/ft³ (480 to 580 kg/m³) or at 50 ± 5 % relative humidity and 73.5 ± 3.5°F (23 ± 2°C) it shall weigh 29 to 35 lb/ft³ (460 to 560 kg/m³). (See Note 1.)

22. Character of Wood

22.1 The wood shall be free of knots, pitch pockets, and other defects. The color of the wood shall be uniform across each panel with no streaks that are excessively light or dark. The number of annual growth rings per inch along the radius of the log from which the wood was obtained shall be not less than ten. The surfaces shall be smoothly planed and sanded thoroughly with 150 grit sandpaper within two weeks of testing.

22.2 The wood shall be heartwood and selected as edge grain or flat grain as desired. The test surface of flat grain wood

shall be on the bark side.

23. Thickness of Panels

23.1 The minimum thicknesses (see Note 2) in proportion to width (across the grain) shall be as follows:

Panel Width, in. (mm)	Minimum Thickness, in. (mm)
Less than 3 (less than 75)	7/16 (11)
3 to 6 (75 to 150)	7/16 (11)
Over 6 (over 150)	3/4 (19)

24. Keywords

24.1 weathering; wood coatings; wood panels

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