



# APA PERFORMANCE RATED PANEL SUBFLOORS UNDER HARDWOOD FLOORING

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## Summary of performance

APA Performance Standards have been instrumental in the market acceptance of oriented strand board (OSB), composite (COM-PLY®) and plywood wood structural panels. Since promulgation of APA Performance Standard PRP-108 in 1980, over 600 billion sq. ft. (3/8-inch basis) of sheathing panels have been produced by APA member mills. Over 80 billion sq. ft. (3/8-inch basis) of this sheathing production has been used in floor systems in new residential construction. These figures include OSB, COM-PLY and plywood panel production from APA member mills. APA trademarked wood structural panels ably fulfill the end-use requirements for floor systems, as well as other sheathing applications.

Plywood, composite and OSB APA Rated Sheathing and APA Rated Sturd-I-Floor panels have been used successfully as subfloors under 3/4-inch hardwood flooring. APA plywood sheathing has a long, successful performance history in this application. OSB and COM-PLY APA Rated Sheathing panels have been shown to be equivalent in performance to plywood APA Rated Sheathing in subfloor applications. This is evidenced by the fact that these panels have qualified for

the same Span Ratings as plywood, and by successful uses of composite and OSB panels for subfloors under hardwood flooring.

## APA Recommendations

### Panel Specification

Both APA Rated Sheathing and APA Rated Sturd-I-Floor panel grades are commonly used for subfloors. These APA wood structural panels may be of plywood or composite construction, or may be mat-formed panels such as OSB.

APA panel subfloor spans are limited to maximum spacing of floor framing listed in Table 1. For improved stiffness and to help eliminate floor squeaks when hardwood flooring is installed, the Code Plus® spans listed in Table 1 are suggested.<sup>(a)</sup>

### Installation of Subfloors

Subfloor panels shall be installed continuous over two or more spans, with the long panel dimension perpendicular to floor framing. All panel ends and edges should be spaced 1/8 inch.

The subfloor panels should be glue-nailed to the floor framing using construction adhesives conforming with APA Specification AFG-01 or ASTM D 3498. Tongue-and-groove or blocked panel edges also should be glued.

Glue-nailed subfloor panels up to 3/4-inch thick should be fastened with 6d ring- or screw-shank nails or 8d common nails spaced 12 inches o.c. along panel ends and intermediate supports. For subfloor panels thicker than 3/4 inch, and for nailed-only subfloor installation,

TABLE 1

**SUBFLOORS AND SPACING OF FLOOR FRAMING FOR HARDWOOD FLOORING<sup>(1)</sup>**

APA Rated Sheathing or Sturd-I-Floor Span Rating	Spacing (in.) of Floor Framing	
	Maximum Spacing	Code Plus Maximum Spacing
24/16	16	12
32/16, 16 oc	16	12
40/20, 20 oc	19.2	12
48/24, 24 oc	24	19.2
60/32, 32 oc	32	24
48 oc	48	32

<sup>(1)</sup> When wood structural panels are used for subfloors under hardwood flooring, the National Oak Flooring Manufacturers Association (NOFMA) recommends minimum 19/32-inch plywood (Span Rating 40/20 or 20 oc), or 23/32-inch OSB (or COM-PLY; Span Rating 48/24 or 24 oc). Thicker panels with a higher Span Rating also may be used.

see *APA Engineered Wood Construction Guide* (APA Form E30) for fastener size and spacing.

### **Preparation of Subfloors for Hardwood Flooring Installation**

Both the subfloor and hardwood flooring are sensitive to moisture. Most hardwood flooring is delivered dry (less than 10% moisture content). Expansion and buckling of the hardwood flooring can occur if exposed to excessive moisture, or opening of gaps between flooring strips can occur upon subsequent drying, and floor squeaks may result. This reaction to moisture can occur regardless of the panel type used for the subfloor.

If the subfloor has become wet during construction, it is imperative that it dries prior to installation of hardwood flooring. A moisture meter can be used to check the condition of the subfloor, which should be within a range consistent with recommendations of the hardwood flooring manufacturer. (Note: Moisture measurement results will vary depending on the panel and meter type. In order to insure accurate results, it is important that the moisture meter be calibrated before use. Calibration should be conducted in accordance with the moisture meter manufacturer's recommendations.)

For homes with crawl-space floors, the builder should ensure that the crawl space is well drained and dry when

hardwood flooring is installed. Also, 6-mil polyethylene sheeting should be installed as a vapor retarder on the ground in the crawl space prior to installation of the hardwood flooring.

Inspect the subfloor for flatness between joists. When necessary, the builder should install extra blocking and re-fasten the subfloor to flatten uneven areas. Check the subfloor for squeaks or loose panels and re-fasten as necessary before installing the hardwood flooring.

The installer should inspect the subfloor for smoothness along joints between panels. Any ridges at panel edges should be sanded smooth prior to installation of the hardwood flooring, using a heavy-duty floor sander with a moderately coarse grit sandpaper.

### **Hardwood Flooring Installation**

Follow the recommendations of the hardwood flooring manufacturer, or the National Oak Flooring Manufacturers Association (NOFMA)<sup>(b)</sup>, for handling, storing and acclimatizing, and installing hardwood flooring. Where possible, it is suggested that the hardwood flooring strips should be oriented perpendicular to floor framing for maximum floor stiffness.

(a) For further information on the Code Plus program, see APA Code Plus brochure, Form CP-1075.

(b) National Oak Flooring Manufacturers Association, P.O. Box 3009, Memphis, Tennessee 38173-0009; Phone (901) 526-5016.

We have field representatives in most major U.S. cities and in Canada who can help answer questions involving APA trademarked products. For additional assistance in specifying APA engineered wood products, contact us:

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*The product use recommendations in this publication are based on APA – The Engineered Wood Association's continuing programs of laboratory testing, product research, and comprehensive field experience. However, because the Association has no control over quality of workmanship or the conditions under which engineered wood products are used, it cannot accept responsibility for product performance or designs as actually constructed. Because engineered wood product performance requirements vary geographically, consult your local architect, engineer or design professional to assure compliance with code, construction, and performance requirements.*

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