



APA RATED STURD-I-FLOOR PANEL APPLICATION RECOMMENDATIONS FOR MANUFACTURED HOMES

Number F415H

September 2002

Background

Application recommendations for APA Rated Sturd-I-Floor panels, as published in APA literature, are based on panel installation under on-site construction conditions. For example, it is likely that panels will be subjected to occasional wetting, such as from rain or snow, dew, or high humidity during construction. The wetting can take place in varying amounts and over varying time periods, and panels may reach relatively high moisture levels in some cases. Spacing of 1/8" at panel edge and end joints is recommended to accommodate panel expansion which may occur when dry panels are subjected to the extremes of moisture encountered during on-site construction.

A special case arises when panels are installed under dry, in-plant conditions, such as in the construction of manufactured homes. In particular, when panels are not subjected to high moisture conditions during construction or transportation of manufactured homes, a modification to the normal edge spacing recommendations is justified. The following application recommendations are made for installing APA Rated Sturd-I-Floor panels in manufactured homes, when the above conditions are met.

General

Recommendations pertain to all APA Rated Sturd-I-Floor wood structural panels for the thickness and Span Rating marked on the panel. These recommendations are intended only for manufactured homes where floors are protected from exposure to high moisture conditions during construction and transportation.

For manufactured homes which comply with the Federal Manufactured Home Construction and Safety Standards (MHCSS), Sturd-I-Floor panels should be trademarked for compliance with U.S. Product Standards PS 1 or PS 2, APA Performance Standard PRP-108, or identified with an APA Series designation (see special note at end of this publication). Performance-tested panels meeting PRP-108 requirements also are identified in the trademark as complying with HUD Use of Materials Bulletin UM-40.

Sturd-I-Floor panels provide a smooth surface for application of carpet, and possess high resistance to concentrated static and impact loads and to surface indentation. For floors which are finished with resilient floor coverings such as tile or sheet flooring or fully-adhered carpet, APA Rated Sturd-I-Floor plywood panels with a "sanded face," or OSB panels with equivalent smoothness, should be specified (see trademark example). Follow the recommendations of the floor covering manufacturer with regard to selection and preparation of wood structural panels as a substrate for resilient flooring products.

If ceramic tile is used for finish flooring, use APA Rated Sturd-I-Floor panels with a Span Rating of 20 oc or greater. Refer to the Tile Council of America Handbook for Ceramic Tile Installation and ANSI Standard A108 for installation recommendations and details for ceramic tile installation.

EXAMPLES OF APA TRADEMARKS FOR ORIENTED STRAND BOARD (OSB) OR PLYWOOD STURD-I-FLOOR PANELS. (Veneer-faced plywood panels also may indicate "Sanded Face" in trademark.)

APA
 THE ENGINEERED
 WOOD ASSOCIATION
 RATED STURD-I-FLOOR
20 oc 19/32 INCH
 SIZED FOR SPACING
 T&G NET WIDTH 47-1/2
 EXPOSURE 1
000
 PS 1-95 UNDERLAYMENT
 SANDED FACE PRP-108

APA
 THE ENGINEERED
 WOOD ASSOCIATION
 RATED STURD-I-FLOOR
24 oc 23/32 INCH
 SIZED FOR SPACING
 T&G NET WIDTH 47-1/2
 EXPOSURE 1
000
 PS 2-92 SINGLE FLOOR
 PRP-108 HUD-UM-40

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Exposure

Panels marked Exposure 1 have a fully waterproof bond and are capable of withstanding normal moisture conditions as might be expected in floor applications, including humidity and occasional wetting from water leakage. Such panels qualify as moisture resistant and can be used without sealing of panel edges for floor applications in kitchens, bathrooms, utility rooms and other areas of potential moisture exposure as described in the MHCSS. However, panel edges or the top surface of Exposure 1 panels should not be permanently exposed to the weather. If permanent exposure to weather is required, such as for outdoor decks, Sturd-I-Floor panels marked Exterior should be specified. Panels should be pressure-preservative treated if used under outdoor carpeting. Note, however, that treatment of tongue-and-groove panels with water-borne preservatives may result in difficulty mating T&G joints. Use of square-edged panels or milling T&G edges after treatment should be considered.

If possible, panels should be stored in a warehouse or under a roof, to avoid surface or edge weathering which might result in unnecessary delays for surface preparation after panel installation. Cut the banding on panel bundles to prevent edge damage, and temporarily add weights to the top panel in the stack to avoid any possible warpage from humidity. If panels must be stored outside, refer to handling and storage recommendations in APA's *Engineered Wood Construction Guide*, Form E30.

Installation

Install panels with the face grain or panel strength axis (generally the long dimension of the panel) oriented across supports spaced no farther apart than the Span Rating shown on the trademark. Panels shall be continuous over two or more spans.

Panel end joints shall be staggered and shall occur over framing. Panel edge joints shall be T&G or supported by framing or battens. Glued T&G edges are recommended under resilient floor coverings to assure snug joints. For floors of manufactured homes, a minimum 1/32" spacing is recommended at panel end and edge joints of 4' x 8' panels. For panels larger than 4' x 8', recommended spacing at panel end and edge joints is 1/16" minimum.

Note 1: Sturd-I-Floor panels with T&G edges provide for a self-spaced face gap of 1/32" to 1/8" along the T&G joint.

Note 2: Check the floor covering manufacturer's recommendations concerning filling of panel joints when fully-adhered or perimeter-attached resilient floor covering is used. Use only recommended floor joint compounds or fillers.

Fastening

Nailed Floors. Use 6d deformed-shank nails for panels 3/4" or less in thickness, and 8d deformed-shank nails for thicker panels. When joists are well seasoned, 8d common nails may be substituted for panels 7/8" or less in thickness, and 10d common nails may be used for 1-1/8" panels.

For panels 7/8" or less in thickness, space nails 6" o.c. at end supports, and 12" o.c. at intermediate supports. For 1-1/8" panels, space nails 6" o.c. at end and intermediate supports except 12" o.c. at intermediate supports when joist spacing is 32" o.c. or less.

Other fasteners, such as power-driven staples, may be used where permitted by codes or HUD. When installing Sturd-I-Floor panels with power-driven fasteners, ensure contact by standing over the joist at or near the fastener location. Do not overdrive or underdrive fasteners, which could result in "telegraphing" the fastener or panel joint location through resilient tile or sheet flooring, or floor squeaks due to movement between the floor panels and framing. Check the operation of pneumatic nail or staple guns to ensure that fasteners are driven so that the fastener heads or crowns are flush with, or just slightly below the panel surface. If staples are used, install with the staple crown parallel to the face grain direction of plywood, to prevent "chipping" of the face ply.

Glued Floors. Adhesives meeting APA Specification AFG-01 or ASTM D 3498 are recommended for gluing APA Rated Sturd-I-Floor panels to joists.

Note 3: Solvent-based adhesives are suggested if the back surface of the panel has been sealed or coated to retard moisture absorption; check with the panel manufacturer for further information. The solvents in some construction adhesives have been reported to occasionally cause staining or other installation or appearance problems with certain types of resilient tile or sheet flooring; contact the floor covering and adhesive manufacturers for further recommendations.

Note 4: Other types of adhesives, such as polyvinyl-acetate (white) glue may be used with panels having unsealed or uncoated back surfaces, when specified in the approved design of the manufactured home.

Apply a continuous bead of adhesive on the joists (double bead under butted panel ends or edges) and the groove of tongue-and-groove panels. Adhesives should be applied in accordance with the recommendations of the adhesive manufacturer. Note that it is important to complete nailing before the glue sets.

For glued floors, space nails 12" o.c. at all supports for panels 7/8" or less in thickness. For 1-1/8" panels, follow the nail spacing recommendations above for nailed floors.

When staples are used with glued floor construction, a staple spacing of 6" o.c. along the joists is suggested. Flatten the panels as described above to ensure good contact with the joist surface when using power-driven fasteners.

Preparation of Sturd-I-Floor for Finish Flooring

In areas to be covered with pad and carpeting, gaps at panel edges do not have to be filled. Where fully-adhered vinyl or similar resilient flooring materials are installed, gaps should be filled when recommended by the floor covering manufacturer (see Note 2). Sand any surface roughness thoroughly, particularly at joints and around fasteners.

For more details regarding preparation of floor surfaces for installation of resilient floor covering, refer to *APA Data File, Installation and Preparation of Plywood Underlayment for Resilient Floor Covering*, Form L335.

Moisture Control

Provisions should be incorporated in the design, construction, transportation and installation of manufactured homes for maintaining the floor panels in a dry environment. To avoid moisture entrapment or condensation in floor cavities, a vapor retarder (perm rating of one perm or less) should be applied to the underside of the floor system. The vapor retarder can be incorporated with the protective bottom board typically used, or it can be a separate layer.

For homes which are installed on a permanent crawl-space foundation, a vapor retarder (6-mil polyethylene sheet-

ing) should be installed on the ground in the crawl space, and adequate foundation drainage and underfloor ventilation should be provided in accordance with requirements of the applicable model building code or ANSI/NCSCS Standard A225.1 (available from National Conference of States on Building Codes and Standards, Inc., 505 Huntmar Park Drive, Suite 210, Herndon, VA 22070). When homes are supported on piers or blocks without a permanent foundation, the ground under the home should be sloped or drained to avoid accumulation of standing water, and air circulation should be provided.

Special Note for Sturd-I-Floor single-layer floors in manufactured (mobile) homes which comply with the Federal Manufactured Home Construction and Safety Standards:

In addition to APA Rated Sturd-I-Floor, certain grades of APA Series wood structural panels may be used for single-layer floors for manufactured homes which comply with the Federal Manufactured Home Construction and Safety Standards (MHCSS, or "HUD code"). Such APA Series panels are identified V-, C- or N-216-F, or V-, C- or N-224-F, and show the maximum rated span and allowable floor live load capacity at the maximum span, in the trademark. Panels identified with V- or C- are all-veneer plywood or veneer-faced composite panels, respectively; N- panels are oriented strand board. The last two digits of the three-digit number in the APA Series designation indicate the maximum support spacing for the panels.



These APA Series panels have been evaluated for structural performance (stiffness and strength) under uniform and concentrated loads, for conformance with MHCSS requirements. In addition, they also have been checked for impact resistance and dimensional stability, to assure a high level of performance in service. APA Series panels marked Exposure 1 are manufactured with the same fully waterproof bond for high moisture resistance, as required for wood structural panels used in conventional code-complying construction.

In some cases, panels may be identified with both APA Rated Sturd-I-Floor and APA Series trademarks. Such panels can be used for floor applications either in manufactured homes which comply with model building codes in accordance with provisions of National Evaluation Service, Inc. Report No. NER-108 or in "HUD-code" manufactured homes which comply with the MHCSS. Panel installation must conform to the applicable requirements of NER-108 or the use recommendations in this publication, respectively.

Unless otherwise noted in the trademark, plywood panels must be installed with the face grain oriented perpendicular to supports; and oriented strand board (OSB) panels may be installed with the long dimension or strength axis of the panel either parallel or perpendicular to supports. For single-layer floor applications, panel end and edge joints must be supported by framing or battens, or by tongue-and-groove (T&G) edges.

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 engineered wood products, contact us:

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Form No. F415H
Revised September 2002/0100

