A GUIDE FOR HOME BUILDERS / CONTRACTORS / DIYERS

Technical Bulletin

Particleboard Underlayment Installation

COMPOSITE PANEL ASSOCIATION

Introduction

Particleboard underlayment is a composite panel product engineered specifically to meet flooring requirements, and is accepted for use by all the International Code Council model building codes and most U.S. and Canadian provincial and municipal building codes. Particleboard panels provide a smooth, uniformly thick, solid base—free of knots, voids or grain—suited for most types of floor coverings, such as resilient flooring, laminate flooring, carpeting and seamless flooring.

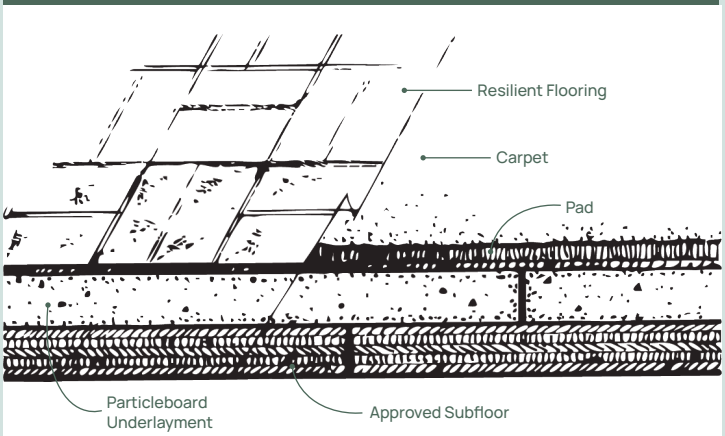
Particleboard panels are manufactured to a precision thickness of +/- 0.015 inch, and provide a level base and even joints for floor coverings. They also resist impact of denting, yet are resilient and comfortable underfoot.

Supplied in the standard 4 x 8 foot size, particleboard panels cover large areas quickly and are available in a variety of thicknesses from 1/4-inch to 3/4-inch. They are easy to handle and cut with ordinary hand tools, and can be fastened with nails or staples without splitting. Particleboard panels can be bonded to other flooring components with adhesives, which spread easily and evenly over smooth panel surfaces for greater tensile bond strength.

Storage and Handling

Store particleboard panels flat on bunks or skids in a dry, covered and level area. Particleboard underlayment should be installed shortly before the floor covering and after other interior finish work is completed. Do not bring particleboard panels to the job site before they are needed. Do not install particleboard underlayment before the structure is closed-in and materials (concrete, plaster, drywall taping compound, paint and subfloor) have dried to the moisture conditions that will be found in the structure during occupancy.

FIGURE 1



Construction and Preparation of Subfloor

Particleboard underlayment should be applied over appropriate code approved subfloors. The subfloor must be of wood construction, dry, level, securely nailed, and free of foreign matter and projections. Ground level in crawl spaces should be at least 18 inches below the bottoms of floor joists and the ground within the crawl space should be covered with a minimum 6 mil polyethylene vapor retarder or equivalent. The crawl space should be well vented with uniformly distributed foundation vents. Do not apply particleboard underlayment over concrete or below grade.

When particleboard underlayment is to be applied with nails or staples, panel subfloors should be at least 19/32-inch thick with a minimum of 32/16 panel span rating. When particleboard underlayment is to be glue nailed, panel subfloors should be at least 15/32-inch thick (plywood) or 7/16-inch thick (OSB), with a minimum of 24/16 panel span rating.

Structural panel subfloors should be installed with the long panel axis perpendicular to the joist system. Lumber subfloors should be at least 1-inch nominal thickness and not more than 8-inches wide.

Floor areas over furnaces should be insulated and well ventilated. Hot air ducts should be insulated to prevent localized drying and shrinkage of floor components.

Installation of Underlayment

Particleboard underlayment shall be installed in compliance with the governing building code. The 2024 (or current) International Building (IBC) section "2303.1.8.1 Floor underlayment," 2024 (or current) International Residential Code (IRC) section "R503.3.2 Floor underlayment" and the National Building Code of Canada 2020 (or current) section "9.30.2 Panel-Type Underlay" each have corresponding sections specifying the requirements of fasteners and spacing of fasteners.

Install particleboard underlayment shortly before covering with finish floor materials. If the underlayment has been subjected to high humidity conditions prior to application, separate panels with sticks so air circulates and use furnace heat to dry them. If subjected to high humidity conditions after application, use furnace heat to dry before applying the floor covering.

Start laying the panels at a corner of the room. Leave a 3/8- inch gap between underlayment and walls. Arrange panels so that four panel corners do not meet at one point. Butt all panel edges and ends to a light contact.

With structural panel subfloor, offset underlayment panel joints and subfloor panel joints that are at right angles to the joists at least 2 inches. Offset underlayment panel joints and subfloor panel joints that are parallel to the joists at least one joist. When 1/4-inch or 5/16-inch particleboard underlayment is used, the floor thickness (subfloor plus underlayment) should be 1 inch or greater.

With lumber or decking subfloors installed perpendicular to the joists, apply underlayment panels with edges over the joists, and with ends offset at least 2 inches from a subfloor joint. With lumber or decking subfloors applied at an angle to the joists, apply the underlayment panels perpendicular to the joists with end joints parallel to and over a joist. In both cases use minimum particleboard thickness of 3/8-inch.

For safety considerations, review the Safety Data Sheet (SDS) and any other guidance document provided by the particleboard manufacturer. Sawing underlayment generates fine dust, and table saws should be connected to a vacuum system. A shop vacuum can be connected to small table saws with a sheet metal sleeve. Individuals working with wood products including particleboard, on the job or in the home shop should wear at minimum the following safety equipment: a half-mask respirator (filter) that is NIOSH approved and has a HEPA filter rating printed on the package, side-shielded safety glasses, a long-sleeve shirt and gloves.

Filling and Sanding

Fill gouges, gaps and any chipped edges with a premium quality hard setting, non-shrinking patching compound intended for this purpose following manufacturer's instructions. Allow filled areas to dry thoroughly and then sand flush with a wide belt sander. Sand any uneven joints between panels. Panel joints must be perfectly matched to prevent show-through.

Floor Coverings and Flooring Application

Particleboard underlayment may be covered with carpeting, laminate flooring, resilient floorings, or seamless floor coverings. Do not apply ceramic or porcelain tile over particleboard underlayment. Thoroughly vacuum the underlayment surface prior to installation of any floor covering.

Carpeting
Carpets should be installed as recommended by the manufacturer. The use of particleboard underlayment requires no special techniques.

Laminate Flooring
Laminate flooring should be installed following the manufacturer's recommendations.

Resilient Flooring
Resilient flooring, tile or sheet goods should be 1/8-inch or greater in thickness. Floor coverings thinner than 1/16- inch should not be used.

If fully adhered resilient sheet or tile flooring is installed, choose a premium quality, high solids (typically 55-65% solids) flooring adhesive recommended for use by the flooring manufacturer with wood underlayments. Before applying adhesive, make sure the underlayment surface is free of all foreign materials and is dry.

When applying floor coverings, the temperature of the room and materials should be above 70 degrees Fahrenheit for a minimum of 24 hours before, during, and after application. Use a notched trowel to spread the adhesive, and apply enough adhesive to afford at least 50% transfer to the flooring. Allow the maximum "open assembly" time within the adhesive manufacturer's recommendations but apply the floor covering before the adhesive loses tack.

Use a lining felt if recommended. The seams of sheet goods should be tight and no closer than 2 inches to a parallel underlayment joint. Roll the fully adhered sheet flooring in both directions with a heavy roller to assure good contact. Keep traffic off newly installed resilient flooring until a bond has been firmly established. For other types of finished flooring, follow the manufacturer's recommendations for installation.

Seamless Floorings
Seamless floorings should be high quality products and must be installed as recommended by the manufacturer.

Seamless floors are applied as several coats of liquid coating materials. They are comparatively thin flooring surfaces and require the utmost care in the preparation of the flooring structure and the underlayment surface prior to coating with the seamless flooring material.

The glue-nailed technique of underlayment application is recommended for all seamless flooring applications. Extra care should be taken to carefully fill and sand underlayment faces, and to build up the recommended thickness of seamless floorings.

Grademark

Always specify particleboard panels from manufacturers certified by the Composite Panel Association's physical and mechanical properties Grademark program. Particleboard floor underlayment bearing the CPA Grademark as a stamp, tag, or sticker is certified to meet or exceed Grade PBU of American National Standard ANSI A208.1-2022 (or current).

To maintain certification, producers must comply with a rigid certification scheme, quality control testing, and quarterly third-party inspections. A sample CPA Grademark is displayed below.

GRADEMARK

The information in this document is believed to be reliable. However, the determination of suitability of this information for any use or application remains the sole responsibility of the user. No guarantees, representations or expressed or implied warranties are made regarding the accuracy and completeness of this information, and the Composite Panel Association (CPA) assumes no responsibility or liability for any loss or damage through reliance upon it. Users should check with the manufacturer for specific recommendations for fasteners and paints.

References

ANSI A208.1-2022, Particleboard, Composite Panel Association, Leesburg, Virginia. (This standard is updated approximately every five years.)

Particleboard From Start to Finish (1996). Composite Panel Association, Leesburg, Virginia.

About CPA

The Composite Panel Association (CPA), founded in 1960, represents the North American wood-based composite panel and decorative surfacing industries on technical, public policy, quality assurance and product acceptance issues. CPA General Members include the leading manufacturers of particleboard, medium density fiberboard (MDF), engineered wood siding and trim in North America, representing more than 90% of industry manufacturing capacity. CPA Associate Members include manufacturers of decorative surfaces, furniture, cabinets, mouldings, doors and equipment, along with laminators, distributors, industry media and adhesive suppliers committed to product advancement and industry competitiveness. CPA is a vital resource for specifiers, manufacturers and users of industry products. The association provides leadership on federal, state and provincial regulatory and legislative matters of interest to industry. As an internationally recognized and accredited standards developer, CPA writes, publishes and maintains the industry's definitive ANSI product standards. CPA also operates the International Testing Center (ITC) and manages the Grademark Certification Program, the largest and most stringent testing and certification program of its kind for North American composite panel products. CPA developed the Eco-Certified Composite (ECC) Sustainability Standard and Certification Program, a voluntary industry standard for particleboard, MDF, and engineered wood siding and trim.

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