SUBFLOOR RECOMMENDATIONS

GENERAL INFORMATION

Congoleum flooring can be installed over properly prepared concrete subfloors on all grade levels, suspended wood floors, metal, terrazzo, ceramic tile, marble, and most single-layer, non-cushioned, resilient floor covering. Congoleum floor tile is not recommended over existing resilient tile installed below grade level.

The subfloor and any existing flooring material must be in sound condition, smooth, dry, and free of extraneous material that will inhibit bonding or cause discoloration.

SUBFLOOR PATCHING MATERIALS

Use latex modified portland cement-based patching compounds/underlayments for filling or leveling subfloor imperfections.

NOTE: Gypsum - (calcium sulfate — also referred to as plaster) based patching compounds/underlayments are not recommended by Congoleum on commercial installations. These materials generally have lower compressive strength, will deteriorate under exposure to moisture or water vapor, and can promote mildew. Congoleum will not warrant or assume liability for installation failures or discoloration associated with the use of gypsum-based products.

CONCRETE SUBFLOORS

Congoleum flooring is recommended for installation over concrete subfloors on all grade levels. Concrete must be clean, dry, smooth, structurally sound, and free of paint, varnish, adhesive, oil, grease, solvents, and other extraneous material including curing and parting compounds, sealers and surface hardeners that will inhibit bonding.

Congoleum flooring is <u>not recommended</u> for installation where excessive moisture, hydrostatic pressure, or alkaline conditions exist. Installation or service failures due to these conditions are not the responsibility of Congoleum Corporation. Congoleum will not warrant or assume liability for such failures.

Conduct moisture and bond tests over new concrete and on or below-grade concrete floors to determine if they are sufficiently dry before proceeding with installation.

New Concrete floors should be constructed, finished, and cured in accordance with the American Concrete Institute (ACI) 302 "Guide for Concrete Floor And Slab Construction," Class 2 or 4 and have a minimum compressive strength of 3,500 psi. New concrete floors require a minimum of six weeks to fully cure and dry.

Suspended Concrete floors can require much longer drying times if constructed on a steel or plastic pan.

On- and Below-Grade Concrete floors must be constructed with an effective moisture/vapor barrier. Normally, a minimum 6 mil polyethylene sheet is used under the concrete for this purpose. The use of topically applied moisture barriers and sealers is subject to recommendations and warranties by the manufacturer of such products. Congoleum makes no recommendations for using topically applied moisture barriers or sealers due to the uncertainty of their effectiveness and compatibility with Congoleum flooring systems.

Lightweight, Aggregate and Cellular Concrete floors with a wet density of 100 lbs./cu. ft. or greater and a minimum compression strength of 3,500 psi are generally suitable for covering with Congoleum flooring. Moisture tests should be conducted to determine if the floor is sufficiently dry.

Preformed Concrete Planks and Sections must be covered with a minimum 2" (5.1cm) thick standard concrete topping.

Radiant-Heated Subfloors should not exceed 90°F (32°C) for sheet flooring and 85°F (29°C) for tile flooring. The subfloor temperature should be limited to 70°F (21°C) for 24 hours prior to, during and 48 hours after installation.

Curing and Parting Compounds - Curing and parting compounds, surface hardeners, and sealers are known to interfere with the adhesive bond to concrete; and, therefore, are not recommended. If these products have been used and they contain soap, oil, wax, or silicone, they must be removed. A Bond Test should be conducted following removal to determine if a satisfactory bond can be achieved.

Moisture and Bond Tests

Moisture Test(s) should be conducted in an area where the subfloor is least subject to drying out. Several tests will be required on large installations.

- Anhydrous Calcium Chloride Test Kit – This method has been designed to provide qualitative and quantitative results. Emission of moisture

vapor from the subfloor should not exceed 5 pounds per 1,000 square feet per 24 hours for Congoleum commercial products.

Calcium Chloride Test kits are available for purchase from your local flooring distributor or can be ordered from:

- Taylor Tools
  5045 Paris Street
  Denver, CO 80239
  (303) 371–7667
- Vaprecision
  3211 W. MacArthur Blvd.
  Santa Anna, CA 92704
  (800) 449-6194

Bond Test(s) should be conducted over concrete subfloors or questionable surfaces being covered. Use the flooring materials and adhesives selected for the installation. Install a 2' x 2' section of flooring following recommended installation procedures. Remove the flooring after 72 hours. The bond strength is considered satisfactory if the flooring cannot be removed intact without great force.

Self-leveling Cementitious Underlayments - Congoleum recommends the use of polymer-modified, self-leveling, portland cement-based underlayment with a minimum compressive strength of 3500 psi (ASTM C-109-mod.). Gypsum-based underlayments are not recommended by Congoleum for commercial installations.

Preparation - Sweep or vacuum the floor to remove loose dirt and dust. Fill all rough or depressed areas, cracks, and score marks with a latex-modified portland cement patching compound.

Powdery or scaly concrete surfaces will need to be prepared, normally by beadblasting or scarifying and then leveled with a latex-modified portland cement underlayment.

Construction, Control and Expansion Joints - Construction and control joints should be cleaned of any debris and then filled level with a latex-modified portland cement patching compound.

Do not install flooring over expansion joints. Flooring should be cut to the joint and then covered with a metal expansion joint cover. Select a cover that will provide a smooth transition to avoid a tripping hazard.

Paint Removal

CAUTION: Certain paints may contain lead. Exposure to excessive amounts of lead dust presents a health hazard. See Caution Statement on inside front cover for removal procedures of lead paint.

All paint must be removed from concrete surfaces. If it has been determined that the paint does not contain lead, then it can be removed, depending on the type of paint, with a solution of trisodium phosphate and hot water or by grinding with a terrazzo or concrete grinder. **CAUTION: Use safety glasses and an OSHA-approved respirator when removing paint. Avoid creating dust.**

Do not use solvent-based paint removers. Residual solvents left in the concrete can adversely affect the floor covering and the adhesive.

WOOD SUBFLOORS

Wood floors must be double-layer construction (Figure 1) a minimum 1" (2.5cm) thick with at least 18" (45.7cm) of well-ventilated air space below structural supports. The subfloor must be structurally sound, not springy, with a deflection no greater than 1/360 of the span under live loads. If the wood floor is constructed over a crawl space, a 4 mil polyethylene sheeting or other suitable ground cover should be used to reduce moisture vapor emissions.

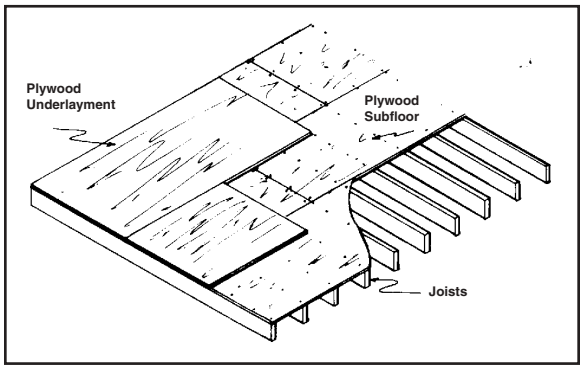

Fig. 1. Typical subfloor structure

Congoleum floors are not recommended for installation over wood floors applied directly over on- or below-grade concrete. This includes wood floors constructed on joists laid over on- or below-grade concrete (often referred to as sleepers).

Stripwood Floors

- Double-layer tongue-and-groove stripwood floors with boards up to 3" (7.6cm) wide: cover with a minimum 1/4" (6.4mm) thick underlayment.
- Rough floors, single-layer floors, and double-layer stripwood floors with boards wider than 3" (7.6cm): Cover with a minimum 1/2" (12.8mm) thick underlayment.

Underlayments

Underlayment, as referred to in this guide, can either be an integral part of the subfloor (as in the top panel in a double-layer subfloor), or as an additional panel used to make the subfloor suitable to receive new floor covering.

Underlayment must be a minimum of 1/4" (6.4mm) thick, with a fully sanded surface. It should not contain substances such as edge sealers, ink, or plastic wood fillers that can stain resilient flooring.

Suitable Underlayments

Veneer plywood panels with the American Plywood Association (APA) trademark which include one of the following grade designations are suitable underlayments for Congoleum flooring.

APA PLYWOOD GRADE DESIGNATIONS

Grade [1], [2]	Exposure/ Durability Classification	Look for these Special Notations In Panel Trademark[3]
APA Underlayment	Exposure 1	Sanded Face
APA C-C Plugged Exterior	Exterior	Sanded Face
APA Underlayment C-C Plugged	Exterior	Sanded Face
APA A-C	Exterior	Plugged Crossbands Under Face[4]
APA B-C	Exterior	"
APA A-D	Exposure 1	"
APA B-D	Exposure 1	"
APA Underlayment A-C	Exterior	Sanded Face
APA Underlayment B-C	Exterior	Sanded Face

(1) Veneer-faced, 19/32" (15.1mm) or thicker panels or APA-Rated Sturd-I-Floor, Exposure 1 or Exterior marked "Sanded Face", or APA Marine Exterior plywood may also be used for underlayment under vinyl or other thin resilient finish flooring.

(2) Specific plywood grades and thicknesses may be in limited supply in some areas. Check with your supplier before specifying.

(3) Recommended for use under resilient finish flooring.

(4) "Plugged crossbands (or core)", "plugged inner plies" or "meets underlayment requirements" may be indicated as an alternate designation in or near trademarks.

Source: American Plywood Association (APA) "Data File" Form No. L335 (Revised March 1999).

Other Underlayments

Other types of underlayments, e.g. fir or birch, plywood, may be suitable in certain applications. Consult the panel manufacturer or supplier for recommended commercial applications, installation procedures and warranties.

Fiber, Cement, and Cementitious Underlayment Panels

Cementitious and composite panels, designed as underlayments for resilient floor covering may be suitable in certain applications. Consult the panel manufacturer or supplier for recommended commercial applications, installation procedures and warranties.

Non-Recommended Underlayments

The following underlayments are not recommended by Congoleum for flooring installed fully adhered: lauan, particleboard, chipboard, waferboard, oriented strand boards, tempered hardboard, untempered hardboard, other wood veneer and wood composition panels not designated as underlayment for resilient floor covering, and glass mesh mortar units.

NOTE: Claims for failure of Congoleum flooring products that are traceable to a lack of performance by the underlayment will not be honored by Congoleum. Regardless of the type of underlayment used, the responsibility for warranties and for performance guarantees for the underlayment rests with the underlayment manufacturer and not with Congoleum.

Underlayment Installation Recommendations

Underlayment must be installed in strict accordance with the underlayment manufacturer's instructions in order to secure their warranty. For detailed instructions consult the underlayment manufacturer or supplier. The following recommendations are intended only as a guide for APA plywood underlayment.

The subfloor over which the underlayment will be installed must be smooth, dry, properly fastened and free of joint swelling, warping, or delamination.

Allow underlayment to acclimate to job site conditions. Install immediately before laying finished flooring to avoid damage from the elements and other trades.

Install underlayment with the face grain running across supports (joists). Stagger underlayment end joints and offset all joints in the existing subfloor/underlayment by at least 2" (5.1cm). Position panels together net without excessive tightness.

Position the fasteners every 3" (7.6cm) around the edges and 6" (15.2cm) throughout the panel. Avoid penetrating framing (joists) with fasteners. Use 3d ring-shank nails for plywood panels up to 1/2" (12.7mm) thick and 4d ring-shank nails for plywood panels up to 3/4" (19.1mm) thick. Divergent chisel point staples may be used in lieu of nails on panels up to 3/8" (9.5 mm) thick.

Sand joints level and fill gaps wider than 1/32" (.8mm) with a latex patching compound prior to flooring installation.

NOTE: Do not use resin, rosin, or cement-coated fasteners. They are not generally

designed for underlayment use and they have been known to stain resilient sheet flooring.

Glued Flooring Systems

Glued flooring systems are commonly used to provide additional subfloor stiffness. The subfloor panel is glued with construction adhesive and nailed to the joist or trusses. A minimum 1/4" (6.4mm) thick underlayment must be applied over the subfloor where resilient flooring will be installed.

NOTE: Congoleum recommends using high-quality, nonstaining, solvent-free, construction-grade adhesive or light-colored PVA woodworking-type adhesive on glued flooring systems. Construction adhesives formulated with solvents or dark processing oils can stain some resilient floor covering even when covered with 1/4" (6.4mm) underlayment.

Lightweight Concrete Topping Over Wood Subfloors

These subfloors are commonly used to provide noise transmission control and fire resistance. The manufacturer of the topping material is responsible for all recommendations and guarantees regarding the suitability and performance of these flooring systems. **Gypsum-based toppings are not recommended by Congoleum in commercial installations.**

EXISTING FLOORING

Resilient Flooring

⚠ WARNING

DO NOT SAND, DRY SWEEP, DRY SCRAPE, DRILL, SAW, BEADBLAST, OR MECHANICALLY CHIP OR PULVERIZE EXISTING RESILIENT FLOORING, BACKING, LINING FELT, ASPHALTIC "CUT-BACK" ADHESIVE, OR OTHER ADHESIVE. THESE PRODUCTS MAY CONTAIN **ASBESTOS FIBERS** AND/OR **CRYSTALLINE SILICA.** AVOID CREATING DUST. INHALATION OF SUCH DUST IS A CANCER AND RESPIRATORY TRACT HAZARD. SMOKING BY INDIVIDUALS EXPOSED TO ASBESTOS FIBERS GREATLY INCREASES THE RISK OF SERIOUS BODILY HARM. UNLESS POSITIVELY CERTAIN THAT THE PRODUCT IS A NON-ASBESTOS CONTAINING MATERIAL, YOU MUST PRESUME IT CONTAINS ASBESTOS. REGULATIONS MAY REQUIRE THAT THE MATERIAL BE TESTED TO DETERMINE ASBESTOS CONTENT AND MAY GOVERN THE REMOVAL AND DISPOSAL OF MATERIAL. WHENEVER POSSIBLE, EXISTING FLOORING SHOULD BE LEFT IN PLACE AND THE NEW FLOOR INSTALLED OVER THE TOP. IF YOU MUST REMOVE OLD FLOORING MATERIAL, CONTACT YOUR RETAILER OR CONGOLEUM CORPORATION INSTALLATION DEPARTMENT, P.O. BOX 3127, MERCERVILLE, NJ 08619, FOR A COPY OF RECOMMENDED WORK PRACTICES. THESE PRACTICES SHOULD BE FOLLOWED.

Whenever possible, it is desirable to leave the existing flooring in place, with the last alternative being removal. The most practical alternatives are to install the new flooring directly over the old floor or install new underlayment (limited to floors of wood construction). Vinyl tile, vinyl composition tile, and non-cushioned sheet vinyl flooring with felt backing are often suitable for covering provided they are in sound condition, smooth (non-embossed), fully adhered and securely bonded.

Remove all wax, floor finish or polish with a liquid stripping solution such as Congoleum Stripper/Polish Remover, C3095. Rinse thoroughly and allow to dry.

Re-adhere loose areas and replace all damaged or missing tile. Fill all cracks, holes, or dents with a latex-modified portland cement patching compound.

Limitations

Installation over existing resilient floor covering may reduce the indentation resistance of the new floor. The use of an embossing leveler is not recommended. Do not install new flooring over more than one layer of old flooring, embossed or cushioned flooring, or where evidence of excessive moisture or alkali conditions exists.

Do not install new flooring over tile products installed below grade level.

Residual Adhesive

Some previously manufactured asphaltic cut-back adhesives may contain asbestos. See Warning Statement on inside front cover. For removal instructions refer to "Recommended Work Practices for the Removal of Resilient Floor Coverings" which is available by writing to Congoleum Corporation, Installation Department, P. O. Box 3127, Mercerville, NJ 08619 or the Resilient Floor Covering Institute, 401 East Jefferson Street, Suite 102, Rockville, MD 20850.

Old residual adhesive must be removed or covered for the preparation of sheet and tile flooring. Commercial floor tile can be installed with cut-back adhesive over residual cut-back adhesive which has

first been wet scraped to a thin film following recommended work practices. An alternate method to removal may be to cover the residual adhesive with a cementitious underlayment. Consult the underlayment manufacturer for recommendations. All warranties and performance guarantees for the underlayment are the responsibility of the underlayment manufacturer and not Congoleum.

NOTE: The use of solvent-based adhesive removers is not recommended.

Terrazzo, Ceramic Tile, and Marble

Congoleum commercial products, except for Forum Solids, can be installed over these substrates on all grade levels. They should be securely bonded over structurally sound subfloors and show no evidence of moisture.

Abrade the surface and fill uneven areas, i.e., joint and grout lines, with a latex-modified portland cement underlayment.

METAL SURFACES

Steel, stainless steel, aluminum, copper, brass and bronze can be covered with all Congoleum commercial products, with the exception of Forum Solids. The metal surface must be abraded and thoroughly cleaned. All rust, oxidation, and contamination such as oil, grease, dirt, etc. must be removed