

*The longevity of hardwood flooring is directly related to proper installation and a lifetime commitment to appropriate care and maintenance.*

**WORTHWOOD SOLID END GRAIN FLOORING**

**ONE-PAGE SUMMARY**

- 1) Stabilize Environment to temperature and humidity (**see page 2**)
- 2) Acclimate Flooring for 4+ days (**see page 2**)
- 3) Prepare Subfloor – dry and smooth (**see page 3**)
- 4) Apply Worthwood strips with expansion joint (**see page 3-4**)
- 5) Sand Floor using Drum or Belt Sander (**see page 4**)
  - a) 60 grit
  - b) 80 grit
  - c) 100 grit
- 6) Fill voids (**see page 4-5**)
- 7) Rotary Buffer/Sander (**see page 5**)
  - a) 100 grit
  - b) 120 grit
  - c) 150-180 grit
- 8) Vacuum & Sweep Clean (**see page 5**)
- 9) Apply WOCA (**note cautions!**)
  - a) Mix (shake/stir) thoroughly (**see page 5**)
  - b) Best to apply to a small area to color test before finishing the entire floor
  - c) Apply first coat – wipe off excess after 30 minutes (**see pages 5-6**)
  - d) Allow to dry 24-48 hours
  - e) Apply second coat, including Fill Option #2 (**see page 6**)
  - f) Allow to dry 12-18 hours
  - g) Burnish with aqua pad (**see page 6-7**)
  - h) Apply third coat and polish (**see page 7**)
  - i) Optional – may buff with lamb's wool after 12 hours of drying (**see page 7**)
  - j) Allow to dry 12-18 hours if applying a fourth coat (**see page 7**)
  - k) Allow to dry 36 hours after last coat before contact with dirt or water (**see page 7**)

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**SPECIFICATIONS AND INSTALLATION INSTRUCTIONS**

**SPECIES:** Douglas Fir, Hemlock, **Oak** or Alder  
**CONSTRUCTION:** Kiln Dried (7-10%) solid wood blocks turned on end and double edge wired with soft aluminum to form a flexible strip  
**APPLICATION:** Commercial or Residential  
**FINISH:** Unfinished  
**SURFACE TREATMENT:** Sanded to 60-grit  
**STRIP LENGTHS:** 12" – 34"  
**WIDTH OPTIONS:** 2 3/4", 3 1/4", 3 5/8", 4 5/8"  
**THICKNESS OPTIONS:** 3/4", 1", 1 1/2", 2", 2 1/2"  
**ENDS:** Precision square cut  
**BACKS:** beveled for flush fit on face  
**LEED CONTRIBUTION:**  
 MR 4 – Pre consumer content  
 MR 5- Within 500 miles of Portland, OR  
 MR 7 –When FSC is specified  
 IEQ 4.2 – Low VOC oil (WOCA) and adhesives  
 IEQ 4.4 –No added urea formaldehyde (Solid End Grain Only)  
**INSTALLATION:** Glue Down

**ADHESIVE RECOMMENDATION:**

- Bostik "Best"
- Franklin "811"

**STORAGE:** Temporarily, while the units are still wrapped on pallets, store anywhere clean and dry. The HVAC during storage may be on, intermittent, or off, providing the wrap is not removed.

**ACCLIMATION IS A MUST:** Although WORTHWOOD SOLID END GRAIN kiln dried between 7-10% moisture content, it must be restacked for acclimating only after the HVAC is on long enough to consistently bring the space to occupancy temperature and humidity. Remove strips from the pallets and place 25 to 30 strips on edge parallel and gapped so that air can contact face and back. Next, place another 25 to 30 strips in the perpendicular direction on top of the first group also on edge and gapped (**see drawing**). Continue cross hatch stacking upward as high as you can reach. Repeat stacks as necessary.

Allow a minimum of four days for acclimation of 3/4" thick material. Acclimation time may increase depending on the thickness of the flooring, approximately 1 1/2 days (36 hours) for each additional 1/4" of thickness. **Example: 1" thick - acclimate 5 – 6 days.**

**DO NOT INSTALL OR ACCLIMATE UNLESS HEATING, AIR CONDITIONING AND HUMIDITY CONTROL FACILITIES ARE IN FULL OPERATION AND ON LONG ENOUGH TO ENSURE OCCUPANCY LEVELS OF TEMPERATURE AND HUMIDITY. FLOORS ARE OFTEN LAST TO INSTALL. AND PREMATURE INSTALLATION CAN CAUSE UNNECESSARY PROBLEMS REQUIRING REPAIR.**

**(1) ACCLIMATE, and (2) INSTALL ONLY AFTER HVAC IS ON LONG ENOUGH TO NORMALIZE BOTH TEMPERATURE AND HUMIDITY. OTHERWISE THERE IS GREAT RISK OF A DIMENSIONAL CHANGE AND FLOOR FAILURE. DO NOT INSTALL UNDER CONSTRUCTION CONDITIONS WHERE DOORS AND WINDOWS ARE OPEN AND HVAC IS INTERMITTENT.**

During acclimation blocks may separate and be loose. To eliminate separation, carefully tap the blocks tight against the angle-iron Jig furnished on plywood. Snip excess wire from ends if needed.

**CHECK HUMIDITY :** Ambient air humidity should read between 35% and **55%** assuming a 65° to 75° temperature. Measure humidity using a reliable hygrometer or sling psychrometer. If humidity is not in this range, postpone acclimation and installation until conditions are normal.

**NOTE:** After finishing the flooring, it is much more resistant to temperature and humidity changes. Even so, it is recommended that the conditions specified above be maintained and long periods without temperature and humidity control be avoided.

**CHECK CONCRETE SUBFLOOR:** Floor shall be depressed by masonry contractor to block depth when using 1" thick material. For slabs on grade, a permanent and reliable waterproof membrane must be within or under the slab extending to all slab edges vertically above surface. Concrete slabs must be protected from outside moisture vapor. New slabs must be cured (at least 50 days old) and dry. Below grade installation not recommended unless conditions are equivalent to properly protected slab above grade. Maximum moisture content of the slab must be less than 2 lb. retention if tested with calcium chloride.

**RELATIVE HUMIDITY TESTING:** ASTM F2170 (Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In Situ Probes).

- a. Select test locations to provide information about moisture distribution across the entire concrete floor slab. Floor slabs on grade and below grade, include a test location within three feet of each exterior wall.
- b. Perform three tests for the first 1,000 square feet and one test for every additional 1,000 square feet thereafter.
- c. At least 48 hours before test is placed, concrete floor slabs should be at the same temperature and humidity that is expected during service conditions.
- d. Use a rotary hammer-drill to drill holes in the concrete slab; 40% depth of slab is required for the holes when concrete is drying from one side and 20% when drying from both sides. Follow manufacturer's Instructions provided with test kits.
- e. Allow 72 hours to achieve moisture equilibrium within the hole before making relative humidity measurements. Follow manufacturer's instructions provided with test kits.
- f. ASTM F710 provides installation guidelines for acceptance of hardwood flooring using relative humidity testing. Typical limits for wood and wood-based products are 75% relative humidity. When getting readings over 75%, you must use a proper vapor retarder, based on the flooring manufacturer's recommendations, or wait for further concrete curing.

**CHECK FOR SMOOTHNESS:** Be sure concrete subfloor is smooth and level. Tolerance should not exceed 1/4" (6.4mm) on a 10 foot (3m) straight edge in any direction. Check floor level with straight metal strip on edge. Double check edges and corners. Eliminate any washboard irregularity. All rough spots or gravel protruding must be ground smooth and low areas filled with leveling compound. If tolerance not as specified, floor

contractor shall INSIST masonry contractor make necessary corrections.

**DAMP PROOF SLAB (OPTIONAL):** This step may be omitted if the concrete (or other substrate) is adequately protected from moisture either by its location above grade or by a permanent and reliable vapor barrier under the slab. If there is doubt concerning the effectiveness of the vapor barrier then either 1) substitute Bostik's "Ultra Set Hardwood Adhesive", which is a urethane formula requiring two applications, or 2) seal the slab with Franklin's Titebond #531 Moisture Control System.

**SUBFLOOR:** WORTHWOOD SOLID END GRAIN may be installed directly over concrete or plywood subfloors which are level and well ventilated underneath. There must not be any cupped area or projecting nails. If WORTHWOOD SOLID END GRAIN is to be installed on an existing synthetic floor, a 1/4" (6.4mm) plywood or untempered hardboard underlayment should be thoroughly nailed. Over Gyp-crete (min 3,000 PSI), apply primer to insure proper adhesion. Underlayment's for sound must be non-flexible and approved by Oregon Lumber Company.

**EXPANSION VOID:** A minimum of 1/2" expansion gap at perimeter is necessary for walls and columns 1/2" (12.7mm) to 1 1/2" (38.1mm) wide. Place lumber or plywood strips on edge along walls and around columns uniformly equal to width of expansion joint. Install WORTHWOOD SOLID END GRAIN flush to strip. Use care applying adhesive near spacing strips. Any adhesive on the void spacing strips could make strip removal very difficult. Taping the side of the strip facing the flooring aids in strip removal. DO NOT remove void spacing strips before adhesive has cured. Be sure all spacing strips, mastic and debris are completely removed from the open void before installing a permanent filler. Cork is the recommended filler for the expansion gap. Allow for maximum expansion available. In aisle way or other narrow areas where WORTHWOOD SOLID END GRAIN meets carpet or other flooring, the expansion void may be omitted.

**SIDE NOTE:** Interpretation of the sanding and finishing procedures may vary from contractor to contractor, causing minor variations in the appearance of the finished product. It is recommended that 2 or 3 color samples be produced for color approval. This may be accomplished during the installation process. Take 2-3 Worthwood Endgrain strips and following the

sanding and finishing section of the instruction manual, complete the procedures on the strips. Submit the strips for color approval before commencing the finishing program on the floor. Be sure all procedures used on the approved color strips are duplicated on the floor itself. If still unsure, choose a small, out-of-the-way area of the floor surface (approximately 2'-3' square). Tape off the area at strip seams and repeat the sanding and finishing process. This may be accomplished during the sanding of the surrounding floor surface. After approval of the test area, the test area can be blended with the entire floor. Please call Oregon Lumber Company with any concerns before continuing (1-800-824-5671). A small amount of time now can eliminate major problems later.

#### **APPLY ADHESIVE:**

Apply per Manufacturer's Recommendations  
If using 1" Solid End Grain, use the following additional instructions:

- Bostik "Best": Use 3/16" (4.8mm) x 1/4" (6.4mm) x 11/16" (17.5mm) V-notched trowel. Spread rate: 50 sq ft per gallon.
- Franklin "811": Use 3/16" (4.8mm) x 1/4" (6.4mm) x 11/16" (17.5mm) V-notched trowel. Spread rate: 50 sq ft per gallon.

#### **APPLY WORTHWOOD STRIPS (Parallel Pattern):**

Use snap lines to start and keep **straight**. Place first strip in corner parallel and tight to temporary lumber filler (void spacer). Place adjoining strips **straight down and as close as possible** to next strip to avoid **crowding excess** adhesive between strips, **which can cause side bonding**. Stagger ends. Tap tight with the metal rake furnished by Oregon Lumber Company. **To keep strips tight you can use blue tape on the face of the flooring every 3-4 strips or use a pin nailer through the edge and at an angle into the subfloor.** Be sure strips are flat prior to placement by flat tapping out any curl. All adhesive must be kept off exposed surfaces. Continue snap lines to maintain squareness.

**CUTTING:** When received, the strip ends will be square. However, blocks within the strip may be out of square. It is recommended to cut strip ends square whenever making strips shorter.

ALLOW ADHESIVE TO CURE 48 HOURS.  
AFTER FULLY CURED, REMOVE VOID SPACING STRIPS LEAVING A UNIFORM GAP

FOR EXPANSION AND FILL EXPANSION JOINT WITH CORK.

**SAND:** (5 grits) – *WORTHWOOD SOLID END GRAIN* will be pre-sanded at the factory with 60-grit. Any light brown (mottled) brownish resin spots or discoloration will be removed by subsequent sanding after installation.

The speed with which a man walks behind the drum sander will have an effect on the results. Suggest 4 passes or cuts with 60 grit done slowly, overlapped half way down and back over the same drum placement., 4 cuts with 80 grit slightly faster and 4 cuts even faster with 100 grit paper using a drum or belt sanding machine.

**NOTE:** Should slab irregularity cause over-wood when installed; drum sand with 40-grit or whatever grit necessary to flush all blocks to even height.

After floor is installed level or drum sanded level, the sanding regimen may begin.

**First Sanding:** Use a drum sander (or a belt sander) with 60-grit. For corners and other locations where the drum or disc sanding is too close to a wall use an edger with the same grit sequence. Initial scratch marks must always be removed by the subsequent grit. Keep all sanding machines moving to avoid burn marks or excessive heat. Be absolutely sure no liquids (paint, water, mud, etc.) contact the floor and avoid traffic until the surface is protected with oil buffed and allowed to cure (approximately 36 hours).

**Second Sanding:** With a drum sander or belt sander, sand for the **second** time with 80-grit.

**Third Sanding:** Again with the drum sander or belt sander, sand for the third time with 100 grit. Be sure all 80 grit sanding scratches are removed before employing Fill Option 1, or changing to disc.

#### **THERE ARE TWO OPTIONS FOR FILLING CRACKS.**

**FILL OPTION 1:** After 100-grit drum or belt sanding, fill any large cracks or gaps using *Wood Wise*.

**Fill Option 2** is performed during the WOCA Oil Finishing Process and discussed later.

**FILL OPTION #1:** If the floor has wide gaps, fill first by grinding cork into the gaps to approximately 1/8" below the floor surface to allow for filler, and then trowel fill with the appropriate *Wood Wise* latex

filler. This will allow the *Wood Wise* to hold the cork in the joint. Then proceed with the next sanding of the floor. This will remove any excess filler from the floor surface.

**Fourth Sanding:** Sand for the **fourth** time with a rotary buffer. A Trio floor sander is recommended. Remove all excess fill using a 100-grit disc. The flooring must be disc sanded to remove any lines on the floor from the drum or belt sander and to remove any 'fiber-pull' which will result in lighter and darker areas of the finished floor.

**Fifth Sanding:** Again using a rotary buffer sand for the **fifth** time using a 120-grit disc or screen.

**Sixth (last) Sanding:** Using a rotary buffer sand for the **sixth** time using a 150 or 180-grit disc or screen. All previous grit sanding scratches and

surface irregularities must be removed by the final 150 - 180-grit sanding. Any surface flaws will become more apparent with the application of oil. (see *Instructions for Finishing with WOCA oil for 120 grit option*). Replace all sand paper grits as required to maintain consistency and a clean cut.

After final sanding additional filling may be necessary using *Wood Wise*. Fill, and using a 180-grit disk or screen, remove all excess filler.

Save sander dust from all grits, except disc screen. Dust can be later mixed with oil to fill cracks.

**CLEAN:** Vacuum and sweep clean. Remove all sources of dust and other particles from ledges, radiators, etc. Allow to dry completely (overnight).

#### FINISH WITH WOCA OIL

#### INSTRUCTIONS FOR FINISHING WITH WOCA OIL

**Warning:** Oil soaked rags must be properly stored and disposed of as they can self-ignite!

ØKeep a box of lint free painter's rags and a bucket of water handy. Also have a piece of cardboard available to rest tools and wet pads on. Never rest wet pads or naps on bare wood.

ØDo not walk in the oil with sneakers, put plastic shopping bags over your feet.

ØOnce you start this process, you cannot stop until the floor is completely finished.

ØUse painter's blue tape with orange core to protect existing door frames and base moldings if already installed.

**Note:** all oils must be mixed thoroughly in their original containers before being transferred to another container. Stirring from the bottom upwards, be sure all

pigment is removed from the bottom of the container and dispersed evenly throughout

the oil. This process must be repeated before every transfer of oil to another container.

ØDO NOT combine WOCA Master Oil with WOCA High Solid Master Oil.

**Note:** After mixing the oils thoroughly in their original containers, combining the WOCA (Master Oil only) into one container will help ensure a uniform color transfer. In a separate container, repeat this process with the Woca High Solid Master Oil. If a separate container is not available, dumping like oils back and forth from container to container is recommended. (Master Oil to Master Oil and High Solid to High Solid respectively.)

ØShake well or thoroughly stir all oil before and during use. When using color oil, stir until all pigment is removed from the bottom of the container and dispersed evenly throughout the oil.

➤Put oil soaked rags into a bucket of water or a metal container with a lid as they can self-ignite.

When finishing an end-grain floor with WOCA oil, a slightly different finishing method must be used due to the extreme absorption properties of this type of wood flooring.

▪ Final screening should be done with 180 grit.

*For a low luster (matt) finish 120 grit final screening is an option. With this option the first coat is applied as described below and then wiped off after 30-45 minutes. Do not over oil.*

- The **first coat** is considered a primer coat and is done with **WOCA Master Oil**. Its role is to act as a base for subsequent oil coats. Choose your starting area and pour oil into a **paint tray**. Spread the oil with a **3/8" nap paint roller and extension pole**. Roll the oil as if you are painting the floor. Coverage should be approx. 80 -120 sq. ft. per Liter/Quart. Continue to spread oil until finished. Do not buff the oil into the floor, as this forces too much oil into the floor and the oil base will be too deep, which may cause later bleedback.
- Allow to penetrate approximately 30 minutes. The floor should appear dry and dull. In the event excess oil remains wipe or mop to remove any excess oil or pigment remaining on the flooring surface. Any pigment streaking (wipe marks) must be removed immediately.
- Do not walk away: Check for Bleed-Back approximately 1 hour after removing excess oil. If Bleed-Back occurs, remove immediately. Check after each oil application.
- Let the primer coat dry and harden a minimum of 24 hours (in summer) or 48 hours (in winter).
- The **second coat** is done with **WOCA High Solid Master Oil**. Using a 3/8" nap paint roller and extension pole, apply oil at an approximate rate of 200 sq. ft. per Litre. **FILL OPTION 2:** This coat may be mixed with the sanding dust from the previous sanding.
- **FILL OPTION #2: Mix slurry using oil and sander dust:** In a separate container add sander dust to approximately ¾ full. Slowly add oil while stirring continuously. Slurry should have the general consistency of mayonnaise. The mix should be approximately 25% oil to 75% sander dust. Percentages will vary with the type of oil. Slurry must be easily workable, yet not too thin. Consistency may be adjusted by either adding more oil or more sander dust. Be sure to leave enough free space in the container for adjustments.
- **Application:** After achieving the proper consistency, the slurry may be scooped onto the floor surface. Using a squeegee with a firm rubber blade, spread the slurry thinly and evenly at an approximate rate of 300 square feet per gallon. Add slurry as needed. Be sure sufficient pressure is applied on the squeegee to force the slurry into the seams. Remove as

much excess slurry as possible with the squeegee before buffing it in using a beige 3M (or similar colorfast) pad under a 175 rpm buffer. Be sure the entire floor surface receives even application. (No spot filling.) Remove all excess oil / oil filler mix. Change to a clean white pad or terry-cloth and continue buffing until an even sheen has been obtained and all excess oil, pigment and filler has been removed. Overlap work areas to ensure an even finish with no spray residue from previous passes. Repeat the process until floor is finished. **Be sure no excess oil / filler is left on the surface.**

### **BURNISHING**

- Let the second coat dry and harden for 12 - 18 hours. Surface of the floor must be completely dry before burnishing.
- Burnish entire floor surface with a 3M 20" very fine burnishing pad (aqua) under an 800-2000 RPM buffer. This process helps even the color, increase luster and through friction, harden the finish - preparing the flooring surface for the third (buff) coat of WOCA Master Oil.
- **Burnishing Suggestions** – Preparation of the burnishing pads must be performed well away from the area being burnished. If circular streaks appear on the floor while burnishing, stop immediately and clean or replace the pad.
- **Use Caution Preparing Pad for Burnishing:** Prior to burnishing, affix pad to bottom of buffer. Turn the buffer over with pad facing upward. Turn the buffer on low speed. Using a wire brush, draw the brush across the face of the pad 10-12 times while pressing firmly (with the brush) against the pad. This helps separate and even the nap on the face of the pad. It is **imperative** that no wire brush bristles are left in the pad as they will scratch the surface of the floor, requiring extensive repair. Be sure no debris of any kind is allowed on or near the area to be burnished.
- **Cleaning:** The burnishing pad may require cleaning depending on the size of the area being burnished. If circular streaks appear on the floor while burnishing, stop immediately and clean or replace the pad. Cleaning may be accomplished in the same method as preparing the pad only with greater pressure on the pad with the wire brush. Make sure to remove any wire bristles from the pad as they

will scratch the surface of the floor, requiring extensive repair. If the pad face appears smeared or gummed and not easily cleaned, change to a new pad.

- For a **third coat**, place a **white 3M (or similar) pad** under the buffer with a cotton terry cloth (or, if a slightly lower sheen is desired, a **WOCA Polishing Cloth**) under the pad. Apply one or two capfuls of **WOCA Master Oil** (approx. 300 SF per liter) onto the bottom of the pad or cloth. Be sure the oil is applied evenly. Start polishing!
- Polish the floor until the oil does not continue to spread as you pass the buffer back and forth across the work area. The floor should appear silky with an even look and with no spray or oil droplets visible.
- Pour more oil onto the pad or cloth as needed and continue polishing. Overlap work areas to ensure an even finish with no spray residue from previous passes. Repeat the process until floor is finished. **Be sure no excess oil is left on the surface.**
- The Master Oil will usually pre-harden in 4-6 hours. After 12 hours, if an increased luster is desired, buff the floor surface with a lambs wool or similarly textured pad under an 800-2000 rpm buffer, Allow the oil to cure 24 hours before placing rugs and furniture on the floor.
- Should a **fourth** coat be necessary, repeat the process of the previous coat.
- The oil must cure for 36 hours before any water or dirt comes into contact with the floor.
- **Allow 7 days for the filler to completely cure. Cure time will vary accordingly with the amount of filler. DO NOT vacuum or allow any water or dirt to come into contact with filled areas until fully cured.**

**+ If you must quit the oiling process, pick a logical place to stop. Tape off adjoining planks if necessary before oiling and wipe up any excess oil that may get on bare wood or you will get a “shiny” spot when you continue the oiling.**

**Recommended Taping: Always tape on the seam between planks. Never tape on center or within the outer edges of any individual plank.**

**+ Continuation of oiling should be lightly feathered in across seam. Never stop in the middle of a floor as you will get overlap marks with different sheen levels.**

**+ Change pads as they become tacky or dirty. You can use both sides.**

**+ Once you get use to the amount of buffer time necessary to do a section, increase or decrease the work area to get a rotation going where you do not have any down time.**