



Important Building Code Considerations (IRC Residential)

Before starting, verify your stairs comply with local codes (based on the International Residential Code or equivalent):

- **Riser height:** Maximum 7¾ inches (measured vertically between leading edges of adjacent treads). Uniformity: No more than ⅜-inch variation between the tallest and shortest riser in a flight.
- **Tread depth:** Minimum 10 inches (measured horizontally from the nosing of one tread to the next, at a right angle to the nosing). If tread depth is at least 11 inches, nosing may not be required.
- **Nosing (overhang):** Minimum ¾ inch, maximum 1¼ inches. Uniform within ⅜ inch.
- **Stair width:** Minimum 36 inches clear.
- **Headroom:** Minimum 6 feet 8 inches.
- **Other:** Solid risers (or open with restrictions), consistent dimensions, and structural integrity (stringers must support loads without excessive deflection).

The common "comfort rule" is riser height + tread depth ≈ 17–17½ inches (or specifically riser + tread ≈ 7.5 inches in some guides but prioritize code). Have your stairs inspected if required in your area (e.g., Nashville, TN follows IRC-based codes with possible local amendments).

Materials and Tools Needed

- **Treads and risers:** Hardwood, engineered, or prefinished (match your flooring if possible). Precut options simplify the job.
- **Adhesive:** Polyurethane-based (avoid water-based for wood).
- **Fasteners:** Finish nails (brad or pin nailer).
- **Moldings:** Cove molding under nosing, stair nosing for transitions.
- **Tools:** Tape measure, level, square, stair tread gauge, or template tool (highly recommended for scribing to walls/skirts), table saw or track saw with fine blade, nail gun/compressor, shims, caulk gun, sandpaper.
- **Safety:** Block off the stairs during work.

Acclimate materials to the home's temperature/humidity for 48+ hours. Ensure the rough staircase (stringers, rough treads/risers if present) is structurally sound, level, clean, dry, and squeak-free. Fix any movement with screws/glue.

Step-by-Step Installation (Typical for New Construction)

Work from the **bottom up** for best results. Many pros install risers first, then treads alternately. Two common sequences:

- Riser behind the tread (tread sits on top of lower riser edge).
 - Or tread first, with riser on top of tread's back edge for extra support.
1. **Plan and Prepare:**
 - Lay out all treads and risers. Match grain/color for best appearance (each piece varies).
 - Measure each opening individually—stairs are rarely perfectly uniform. Use a stair tread gauge/tool for accurate scribing to skirt boards or walls (maintain consistent nosing overhang, typically $\frac{3}{4}$ – $1\frac{1}{4}$ inches).
 - Dry-fit pieces. Mark for cuts. Score finished surfaces before sawing to reduce chipping (finished side up on saw).
 2. **Cut Pieces:**
 - Cut risers and treads to exact length/width using a fine-tooth blade.
 - Seal all cut edges with clear wood sealant (especially important for prefinished or engineered products to prevent moisture issues and maintain warranty).
 3. **Install Bottom Riser:**
 - Apply adhesive to the back of the riser (zigzag or perimeter + center pattern).
 - Position and press firmly. Nail or screw into stringers/rough framing. Use shims for plumb/level.
 - Some install the first riser, then the first tread against it.
 4. **Install Treads:**
 - Apply generous adhesive to the rough tread/stringers or back of the finish tread.
 - Place the tread with proper nosing overhang. Use shims to level front-to-back and side-to-side.
 - Press down firmly. Nail/screw from the front (into riser below if applicable) or back.
 - For squeak prevention: Glue thoroughly and ensure tight fit. Some add blocking or glue blocks underneath.
 5. **Alternate Risers and Treads:**
 - Continue up the stairs: Riser, then tread, repeating.
 - Test-fit each piece.
 - Install cove molding under the nosing for a finished look (nailed/screwed after treads are set).
 - At the top: Use a stair nosing or transition piece to match the upper floor.

6. Finishing:

- Fill nail holes, sand if needed (for unfinished wood), and apply finish (stain, poly, etc.).
- Caulk gaps along walls/skirts.
- Let adhesive cure fully before heavy use (follow product times).
- Add handrails, balusters, etc., per code.

Tips for a Professional, Squeak-Free Result

- **Adhesive is key:** Use plenty for a solid bond; it helps reduce movement.
- **Uniformity:** Measure twice; small variations cause issues.
- **Tools that help:** Stair tread gauges/templates make scribing easy for non-square walls.
- **Prefinished vs. unfinished:** Prefinished is faster but requires careful cutting/sealing. Unfinished allows on-site finishing for perfect matching.
- **Open vs. closed stairs:** Open sides may need returns/mitered pieces.
- **Common mistakes to avoid:** Rushing measurements, insufficient glue, or forcing pieces (leads to gaps/squeaks).