WOODWORKING · CHEAT SHEET

Wood screw *pilot & clearance hole chart*.

Drill bit selection for **wood screws across hardwood, softwood, plywood, and MDF**. Pilot, clearance, and countersink sizes for every common screw gauge.

The chart

SCREW SIZE	SOFTWOOD PILOT	HARDWOOD PILOT	CLEARANCE HOLE	COUNTERSINK
#4	1/16" (1.6 mm)	5/64" (2.0 mm)	3/32" (2.4 mm)	1/4" CSK
#6	5/64" (2.0 mm)	3/32" (2.4 mm)	7/64" (2.8 mm)	3/8" CSK
#8	3/32" (2.4 mm)	7/64" (2.8 mm)	9/64" (3.6 mm)	3/8" CSK
#10	7/64" (2.8 mm)	1/8" (3.2 mm)	5/32" (4.0 mm)	7/16" CSK
#12	1/8" (3.2 mm)	9/64" (3.6 mm)	3/16" (4.8 mm)	1/2" CSK
#14	9/64" (3.6 mm)	5/32" (4.0 mm)	13/64" (5.2 mm)	9/16" CSK
1/4" lag	5/32" (4.0 mm)	11/64" (4.4 mm)	17/64" (6.8 mm)	—
5/16" lag	13/64" (5.2 mm)	7/32" (5.6 mm)	21/64" (8.3 mm)	—
3/8" lag	1/4" (6.4 mm)	17/64" (6.7 mm)	25/64" (9.9 mm)	—
1/2" lag	5/16" (7.9 mm)	11/32" (8.7 mm)	33/64" (13.1 mm)	—

> **About wood-screw holes.** A **pilot hole** sits in the lower (deeper) piece and guides the screw thread. A **clearance hole** sits in the upper piece — the screw slips through without engaging the threads, so it can pull the upper piece tight against the lower. Without a clearance hole, threads grip both pieces and the joint never closes (a problem called 'jacking').

Common applications

MATERIAL	PILOT GUIDANCE	NOTES
Softwood (pine, fir, cedar)	Use 60-70% of screw root diameter	Wood compresses around the thread
Hardwood (oak, maple, walnut)	Use 75-90% of screw root diameter	Wood splits without proper pilot
Plywood / MDF	Same as softwood (often slightly oversized)	Less likely to split
Particleboard / chipboard	Use 70-80% of root, OR a coarse-thread screw	Specialized confirmat screws available
End grain (face into end)	Always pre-drill; consider longer screw	End grain has poor holding power
Decking (treated lumber)	Use ACQ-rated screws (galvanized/stainless)	Standard hardware corrodes

Common pitfalls

- **'Self-drilling' or 'self-tapping' screws don't need pilots.** They have a fluted tip that cuts its own pilot. But they're more expensive and don't work as well in dense hardwood — for furniture-grade joinery, pre-drill regardless.

- **Splitting on edge grain is the most common problem.** Screwing too close to the edge of a board (< 1 screw-diameter from edge) tends to split. Pre-drill larger or use a different fastening method.
- **Pilot depth matters too.** A pilot needs to go ALL the way through the depth the screw will sit in. If you stop the pilot short, the bottom of the screw enters wood without a pilot and may split or bind.
- **Countersinks are usually overkill for #6/#8 screws in softwood.** A flat-head screw can pull itself flush into softwood. In hardwood, countersink to prevent the screw head from sitting proud.
- **Lag screws need MUCH bigger pilots than wood screws.** A 1/4" lag in hardwood needs an 11/64" pilot — almost 70% of the screw diameter. Without it, the screw won't drive (or it'll snap).
- **Treated lumber corrodes regular screws fast.** Modern pressure-treated lumber (ACQ, CA) is more corrosive than older CCA-treated wood. Use stainless or specifically-rated treated-lumber screws.

Common questions

What pilot hole do I drill for a #8 wood screw?

In softwood (pine, fir, cedar): 1/16" (1.6 mm) pilot. In hardwood (oak, maple, walnut): 7/64" (2.8 mm) pilot. The hardwood needs a slightly larger pilot to prevent splitting. For deck screws or self-tapping screws in softwood, you can skip the pilot entirely in non-critical applications — the screw's design cuts its own path.

Why do I need a pilot hole if the screw is self-tapping?

Even self-tapping screws benefit from pilots in hardwood (prevents splitting along the grain), near edges (under ~1.5× screw diameter), and for long screws (where deflection is a problem). Self-tapping marketing often refers

to drywall and softwood — for cabinet-grade hardwood always pilot.

How long should a wood screw be?

Rule of thumb: the screw should penetrate the bottom piece by 2/3 to full thickness. For attaching 3/4" plywood to a 1.5" stud, a 1.5" or 2" screw works (penetrates 0.75-1.25" into the stud). Use shorter screws for finish work to avoid breakthroughs, longer for structural connections. Don't substitute a long screw for a thick washer.

Should I countersink before or after driving?

Before. Countersink first (using a countersink bit or a step drill that combines pilot + countersink), then drive the screw. Driving a flat-head screw into an un-countersunk pilot creates uneven seating and can split the wood. For most wood screws, the head should sit flush with the surface, not protrude.

Can I use drywall screws for wood projects?

Generally no. Drywall screws are hardened-brittle and can snap under shear loads. They're designed for low-load drywall installation, not for furniture or structural wood joints. Use real wood screws or deck screws (corrosion-resistant, full-thickness shank). Drywall screws look similar but fail differently — they shear cleanly under stress.

Sources

- **Pilot hole sizing:** American Wood Council (AWC) / wood industry conventions. Most manufacturer recommendations align with the ranges shown.

- **Standard wood screw sizes:** ANSI/ASME B18.6.1 — Wood Screws (Inch Series).
- **Lag screws:** ANSI/ASME B18.2.1 — Square, Hex, Heavy Hex, and Askew Head Bolts and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series).

Disclaimer. Pilot and clearance hole recommendations are general guidelines. For structural connections (deck ledgers, framing), follow the relevant building code and screw manufacturer's installation instructions.