

Hanger Bolt Size Chart

Tip: Set your PDF viewer to "Actual size" before printing to maintain scale.

Standard Hanger Bolt Sizes and Specifications

Diameter	Machine Thread	Common Lengths	Wood Thread Length	Machine Thread Length	Pilot Hole (Hardwood)	Pilot Hole (Softwood)
1/4"	20 TPI (1/4"-20)	2", 2-1/2", 3", 4"	1" - 2"	1" - 2"	3/16" (0.1875")	5/32" (0.156")
5/16"	18 TPI (5/16"-18)	2-1/2", 3", 4", 5"	1-1/4" - 2-1/2"	1-1/4" - 2-1/2"	1/4" (0.250")	7/32" (0.219")
3/8"	16 TPI (3/8"-16)	3", 4", 5", 6"	1-1/2" - 3"	1-1/2" - 3"	5/16" (0.3125")	9/32" (0.281")
1/2"	13 TPI (1/2"-13)	4", 5", 6", 8"	2" - 4"	2" - 4"	3/8" (0.375")	11/32" (0.344")
5/8"	11 TPI (5/8"-11)	5", 6", 8"	2-1/2" - 4"	2-1/2" - 4"	1/2" (0.500")	7/16" (0.438")

Size Selection Guidelines

1. Calculate Required Wood Penetration:

- General rule: 1.5 to 2 times the bolt diameter
- Minimum for secure hold: 1 inch for 1/4", up to 2.5 inches for 5/8"
- Hardwoods allow shallower penetration than softwoods

2. Determine Required Machine Thread Projection:

- Measure hardware thickness
- Add nut height (approximately 1D for hex nuts)
- Add 2-3 threads clearance (approximately 1/4")

3. Calculate Total Length Needed:

Total Length = Wood Penetration + Hardware Thickness + Nut Height + 1/4" Clearance

Example Calculation:

Mounting 1/4" thick bracket to 2x4 lumber (1.5" actual thickness):

- Desired wood penetration: 1.5" (2× diameter for 3/8" bolt)
- Hardware thickness: 0.25"
- Nut height: ~0.35" (3/8" hex nut)
- Clearance: 0.25"
- **Total needed: ~2.35" → Select 3" hanger bolt (3/8" × 3")**

Approximate Withdrawal Strengths (Hardwood)

Diameter	Penetration Depth	Approximate Withdrawal Load	Notes
1/4"	1.5"	200-300 lbs	Indoor furniture, light fixtures
5/16"	1.75"	350-500 lbs	Medium-duty applications
3/8"	2"	500-700 lbs	Heavy furniture, equipment
1/2"	2.5"	800-1200 lbs	Structural, heavy equipment
5/8"	3"	1200-1800 lbs	Industrial, heavy structural

Important: Values for oak with proper pilot holes. Softwoods have 30-50% lower capacity. Apply minimum 4:1 safety factor for overhead or critical applications.

