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Editor in Chief, WOOD magazine

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are premium-priced router bits worth the money?

Or is low-dough the way to go? We milled more than a mile and a half of material to find the differences between the highest- and lowest-priced router bits.



These bundles of 4'-long workpieces represent a mere fraction of the oak and MDF we machined to learn what separates premium- and low-cost router bits.

When shopping for router bits, we've all been tempted by low-cost cutters, wondering what differences exist between them and ones that cost three times as much. A 1/2" round-over bit is a 1/2" round-over bit, right?

To get to the bottom of this burning matter, we purchased 36 1/2"-shank router bits—three each of 1/2" straight, 1/2" cove, and 1/2" round-over—from four manufacturers (two that sell premium-priced bits, and two that sell low-cost bits). Then we put them all to the test.

Tests in red oak gave us real-world results

After weighing each bit, we chucked it into a table-mounted router, fired up the tool, and measured vibration using a dial indicator on the body of the router. We found no discernable difference in weight or vibration between premium- and low-cost bits.

Next we made a cross-grain cut in red oak with each bit, looking for fuzzing and signs of burning on the freshly cut edges. Out of the box, almost all of the premium-priced bits delivered clean, burn-free cuts. On the other hand, most of the low-cost bits fuzzed, with three round-over bits burning slightly, and all low-cost coves burning to some degree on the first cross-grain cut.

With an out-of-the-box benchmark for cut quality established, we went to work routing full-depth profiles with the cove and round-over bits, and ripping 3/8"-deep grooves in red oak. We cut 100 linear feet with each bit, and at the end of each 100' run, we again made cross-grain cuts in red oak, looking for signs of dulling.

Most of the bits made it through this test with flying colors, but we deemed four of the low-cost straight bits unusable by the time we were done. On three of these bits, a carbide cutter broke before we hit the 100' mark. There's no way of knowing what caused these bits to fail—it could be the quality of the carbide, the width of the carbide cutter, inadequate brazing, or something else—but our pre-test inspection showed no visible flaws.

The fourth failed bit slipped in the router's collet regardless of how much we tightened, causing it to change cutting height at random during the test cut. A fifth low-cost bit—this one a cove—lost its bearing at 82' into the test cut, so we removed it from further testing.

As the trials progressed, some of the low-cost bits dulled to the point where feeding material became quite difficult. (In a few instances, we had to push so hard the router table moved.) We suspect that one reason these bits dulled faster than their higher-priced counterparts was because the shear angles of the cutters (see drawing on page 20) are closer to vertical, causing them to chop into the wood more than slice through it. By the end of this test, about half of the

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The first cuts with each bit varied widely, from the fuzz-free cut of a typical premium cove bit (left) to the burning and fuzzy edges caused by a low-cost cove (right).

blades and bits

premium straight bits fuzzed on cross-grain cuts, and one cove bit showed a slight burn.

Next stop on the test track: MDF

To accelerate wear, we next subjected the surviving bits to 100 linear feet of medium-density fiberboard (MDF), a material that dulls cutters faster than domestic hardwoods because of the adhesives in it. During this test, we observed grittiness in the bearings on many of the low-cost bits—something we didn't find on the premium bits.

Why did this happen? The more costly bits have a washer-like shield below the bearing (see the drawing, at *right*) that seems to prevent even superfine MDF dust from penetrating the bearing and robbing it of its lubrication. Diligent cleaning and lubrication of the bearings on the low-cost bits may have extended their lives, but we didn't perform these maintenance tasks.

By the time we'd wrapped up our run of MDF, seven bearings on low-cost bits had seized, and three others were gummy beyond repair. In comparison, all of the

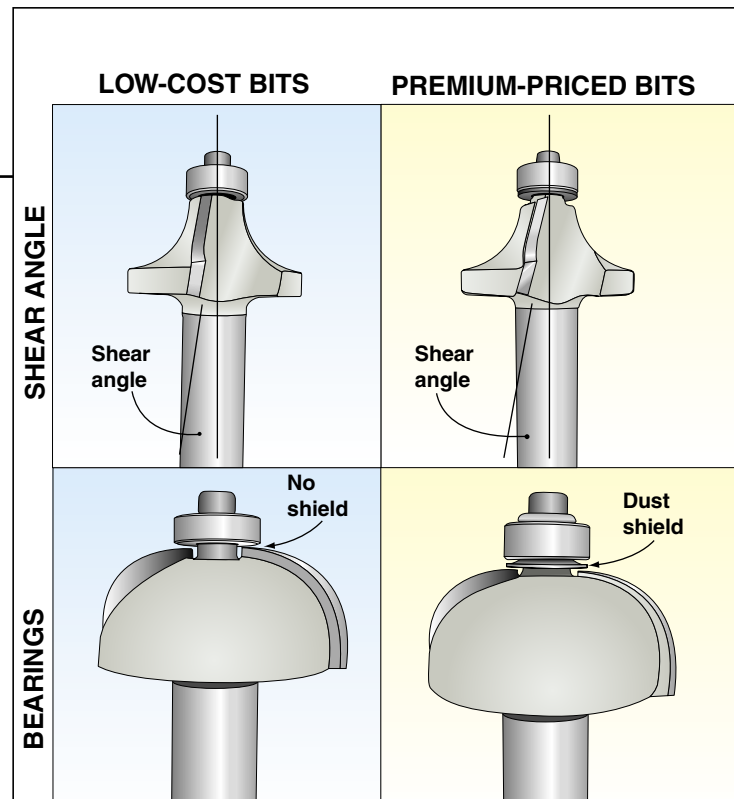
bearings on the premium-priced bits still spun freely.

We again put the surviving bits through our acid test—cross-grain routing in red oak—and found that all of the straight bits fuzzed some, two premium round-over bits burned slightly, and two low-cost round-overs burned badly.

Should you own low-cost bits?

Yes, but with some conditions. Although premium bits clearly outperformed low-cost bits in this punishing test, inexpensive bits represent a terrific value for occasional use, especially when purchased in large sets where you may pay as little as \$3 per bit. Besides being economical, these sets also allow you to keep a large number of bits on hand for occasional use. The trade-off is

that you may have to sand more and spend a little more time maintaining low-cost bits. For bits that endure regular and heavy use or stressful forces, such as straight or panel-raising bits, you'll be money ahead if you start with a premium-priced bit. ♣



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