

Bench-Chisel Review



To get an excellent chisel you have to spend lots of money, but spending lots of money doesn't always mean you'll get an excellent chisel

BY REX ALEXANDER

Look in any woodworking catalog, and you're bound to see chisels priced from \$29.95 for a set of four all the way up to almost 10 times that amount. For a very simple tool—a chisel is really just a steel blade attached to a handle—can there be that much of a difference? Frustrated and perplexed by this wide price gap, I gathered up a tool roll full of chisels to answer that very question. For several months I worked with 17 different ½-in. chisels—some with fancy handles, others that looked like sculpture and a few that I wished I'd never bought because they were uncomfortable to use or they required sharpening too often.

Bench chisels are perfect for cleaning out deep mortises, for paring the shoulders of tenons or for dovetailing. More often than not, I reach for a ½-in. chisel for my bench work, so that's the size I evaluated. If you're in the market for a new chisel or, for that matter, a whole set of new chisels, I think it's safe to assume that the

quality (or lack thereof) of one brand will extend across the range of chisel sizes. If a manufacturer makes a good ½-in. chisel, it stands to reason that its other sizes will also be good.

Going also by the name of bevel chisel or cabinetmaker's chisel, these long, slender chisels can range in overall length from 8½ in. to 11½ in. Each chisel has a thin blade with beveled sides, which makes it easier to work it in tight places such as the corner of a dovetail. The bevel angle and the total thickness of the blades vary among manufacturers.

A handle can be made of wood or plastic and fits into a socket or around a tang on the noncutting end of the blade. A socket chisel's handle fits into a conical cup forged into the end of the blade, kind of like ice cream in a cone. A tang chisel's handle fits around the forged, thin, noncutting end of the blade, kind of like a Popsicle around a stick. Some chisels have a socket-and-tang combination

for affixing the handle to the blade. A socket-and-tang chisel has a tang on the end of the blade and an auxiliary ring that fits around the blade end of the handle. Many chisels have a metal strike ring on the end of their handles to protect the handles from splitting. A tang chisel with a wood handle has a ring where the tang meets the wood and a strike on the other end.

Japanese chisels differ from their Western counterparts in several ways. Aside from the laminated-steel construction, the blades are typically shorter than Western ones. Another difference is the angle of the blade to the handle. The blade of a Western chisel is straight and is mounted parallel to the length of the handle. The blade of a Japanese chisel has a slight curve forged into its flat back (see the top left photo on p. 57). As a result, the back of a Japanese chisel rests closer to the work at hand; a small point perhaps, but some people like the way this makes the chisel feel in their hand. A Japanese chisel has a hollow-ground back that makes it easier to flatten the back.

Forging and steel

Today's chisels are either hand-forged or machine-forged. The majority of tools I tested were machine-forged. Machine-forging is a mechanized production method that involves gas furnaces for heating, huge drop hammers for forming and conveyors that automatically take the chisel to different stations for annealing, tempering and grinding.

Hand-forging is the traditional approach. First, a blacksmith heats steel at a forge. He removes the heated steel and then stands at an anvil and hammers the chisel blank to shape. The blade is then annealed, a process in which the steel is returned to the forge, heated red hot and then slowly cooled. Tempering comes next—slightly heating the steel and then quenching in water or oil. Tempering gives the blade its hardness, elasticity or workability.

Japanese chisels are forge-welded, a hand-forged laminating process of joining soft and hard steel. The thicker, soft steel supports the thinner, hard steel that comprises the cutting edge.

A general rule is that hand-forged chisels, which take a lot of time to make by hand, are more expensive than machine-forged chisels. In blacksmithing, as in woodworking, time is money.

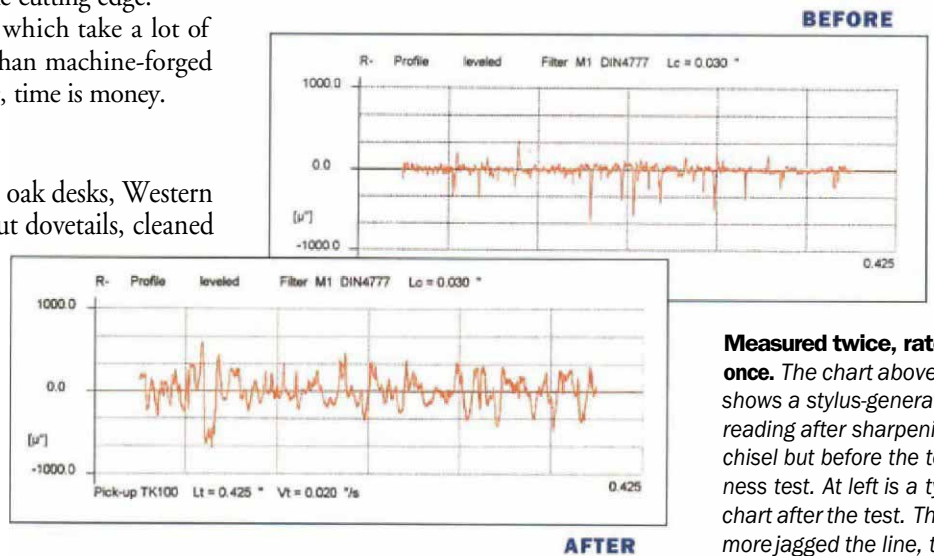
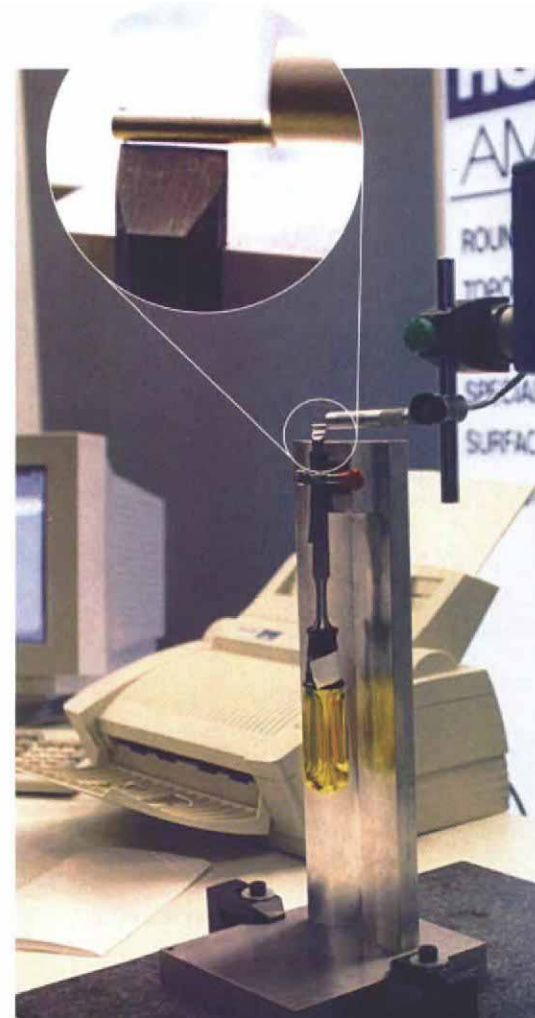
Controlled and uncontrolled testing

I used all 17 chisels as I built a series of white oak desks, Western cedar cabinets and 10 curly maple chairs. I cut dovetails, cleaned out mortises, corner-chiseled rabbet joints, pared end grain on tenon shoulders and even removed partially cured glue from panels. Obviously, my hands are different than yours, as are my work habits and techniques, but while using all of the chisels, I was concerned with how comfortable the tools felt, how balanced they felt and how well the steel performed. Aside from my subjective comments about the look, feel and perfor-

TESTING THE CHISELS



The great equalizer. In the real world, tough steel is more important than hard steel. To gauge the toughness of the chisels' blades, the author took them to a testing lab that measures blade roughness by drawing a minute stylus along the chisels' edges. Each chisel was measured twice: once after sharpening and a second time after the chisel was driven 30 times into a white oak board by a hammer head dropped 6 in. above the chisel's handle.



Measured twice, rated once. The chart above shows a stylus-generated reading after sharpening a chisel but before the toughness test. At left is a typical chart after the test. The more jagged the line, the rougher the chisel's edge.

BENCH CHISELS EDGE TO EDGE



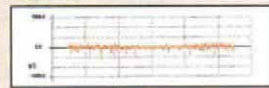
HOW THE CHISELS WERE RATED

After 30 hammer blows in a jig, all but three chisels had dulled cutting edges. In the box that accompanies each chisel photo, the jagged red line is a graphic representation of that chisel's edge after the blows. A flatter line indicates a tougher edge and thus a higher toughness ranking; one being the best and 17 the worst. In some cases, the differences between ranks is miniscule. A real-world rating of excellent, good or average is awarded and explained in the text.



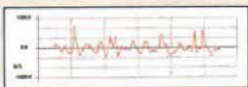
Blue Steel

(800) 537-7820
 1/2-in. chisel: \$38
 Rockwell hardness: 67C
 Toughness ranking: 2



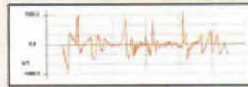
Barr Specialty Tools

(800) 235-4452
 Set of four chisels: \$300
 Rockwell hardness: 61C
 Toughness ranking: 5



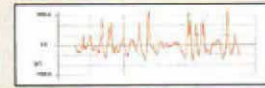
Craftsman

Available at Sears stores
 Set of five chisels: \$29.99
 Rockwell hardness: 60C
 Toughness ranking: 9



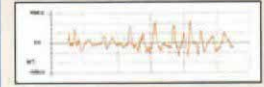
Crown Tools

(800) 249-8665
 Set of four chisels: \$39.96
 Rockwell hardness: 59C
 Toughness ranking: 7



Garrett Wade

(800) 221-2942
 Set of six chisels: \$59.95
 Rockwell hardness: 61C
 Toughness ranking: 11



mance of the chisels, I wanted to devise a more controlled test of the steel in each chisel. I started by taking all of the chisels to a local manufacturing plant for Rockwell-hardness testing.

After I got the Rockwell-hardness numbers, I wanted to settle in my mind a question that had been vexing me for some time. I knew that hard steel is also brittle steel, and a brittle edge can chip under duress. Most catalogs tout the Rockwell-hardness numbers of their cutting tools as a badge, an indication of superior steel. What I wanted to determine was a blade's toughness—how long it would stand up under use between sharpenings.

I made a device to hold a chisel's blade vertically against a piece of white oak. And I made a guillotine-like chute through which I could drop a 2-lb. hammer head against the chisel's handle, thus driving the blade into the oak (see the top left photo on p. 53). Using a water wheel and a 1,200-grit diamond plate, I hollow-ground and honed a fresh 25° bevel on all of the chisels before testing.

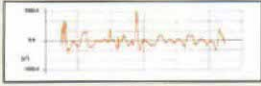
Hommel America is a testing laboratory that uses computer-driven instruments to measure everything from the roughness of a stainless-steel, artificial hip joint to the concentricity of a die for punching out aluminum beer cans. They had the perfect instrument for measuring the roughness of a chisel edge. The machine works by dragging a stylus along the 1/2-in. cutting edge of a chisel, taking 9,500 readings of peaks and valleys in the edge. The instrument measures in micron inches—1 micron in. is equal to 1/1,000,000 in. The sharpened and honed blade of a high-quality chisel deviates in peaks and valleys from a straight line by approximately 250 micron in. Hommel America's instrument represents a roughness reading as a jagged line; the rougher the edge, the more jagged the line. To correspond to the jagged line, the instrument computes a number that indicates in micron inches the mean height of the peaks and valleys of a measured surface. The higher the number, the rougher the surface.

Harris Tools

(800) 449-7747

Set of five chisels: \$109.99

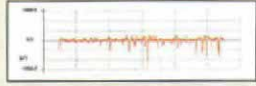
Rockwell hardness: 48C

Toughness ranking: **8****Iyori**

(800) 241-6748

Set of four chisels: \$156.80

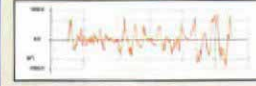
Rockwell hardness: 62C

Toughness ranking: **3****Lee Valley**

(800) 871-8158

Set of five chisels: \$36.50

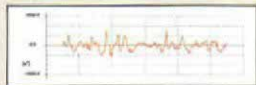
Rockwell hardness: 61C

Toughness ranking: **13****Hirsch**

(800) 241-6748

Set of four chisels: \$79.95

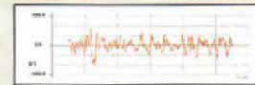
Rockwell hardness: 59C

Toughness ranking: **4****Japan Woodworker**

(800) 537-7820

Set of four chisels: \$67.80

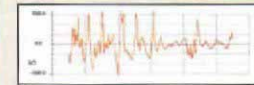
Rockwell hardness: 54C

Toughness ranking: **10****Marples Blue Chip**

Available in many catalogs

Set of five chisels: \$31.50

Rockwell hardness: 62C

Toughness ranking: **16**

The roughness of each chisel edge was measured twice—once when it was freshly sharpened and again after dropping the hammer head, from a height of 6 in., a total of 30 times, which is about the number of blows I thought it would take for the average woodworker to mortise three cabinet hinges.

The surprising results

Armed with a before and an after roughness reading of each chisel edge, I subtracted the before mean number from the after mean number. This change in roughness reading was used to designate the toughness of a chisel's cutting edge as excellent, good and average. I was amazed by the results. There is a huge difference in the way the chisels performed. Here's my evaluation of the tools, in alphabetical order: After a brief description of each chisel, a single-word designation—excellent, good or average—indicates how the tool did in the toughness test.

Barr Specialty Tools—Handmade in McCall, Idaho, this chisel is very expensive—it costs \$300 for a set of four—but it is a delight to hold and behold. This well-balanced tool comes buff polished out of the package. The side edges of the chisel were knife sharp, which I don't like, but I was able to knock off the edges fairly easily with 120-grit sandpaper. The chisel sharpens easily, and the cutting edge lasted a long time. Good.

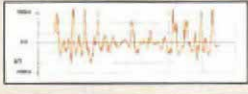
Blue Steel—This small Japanese chisel—only 8½ in. long—is well balanced and a pleasure to use. After 30 blows with the hammer head, the cutting edge on this chisel, like two of the other Japanese chisels, showed virtually no signs of wear. Excellent.

Craftsman—I've owned several Craftsman butt chisels that would hardly hold an edge, so I was pleased to find that the steel in this chisel has been improved. The handle is, to put it nicely, awkward.

BENCH CHISELS EDGE TO EDGE (continued)

Pfeil

(800) 225-1153
Set of four chisels: \$84.49
Rockwell hardness: 61C
Toughness ranking: 17



Robert Sorby Octagonal

Available in many catalogs
Set of four chisels: \$130.45
Rockwell hardness: 61C
Toughness ranking: 14



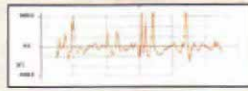
Two Cherries

(800) 356-2195
1/2-in. chisel: \$18.65
Rockwell hardness: 59C
Toughness ranking: 6



Robert Sorby Gilt-Edge

Available in many catalogs
Set of four chisels: \$140
Rockwell hardness: 61C
Toughness ranking: 12



Stanley 5002

Available in many catalogs
Set of four chisels: \$37.96
Rockwell hardness: 63C
Toughness ranking: 15



White Steel

(800) 537-7820
1/2-in. chisel: \$32
Rockwell hardness: 64C
Toughness ranking: 1



Almost 2 in. longer than the blade, the thick, black plastic handle has a circumference of more than 4 in. Average.

Crown Tools—All of the surfaces of this English-made chisel—the quality blade and the acrylic handle—are beautifully smooth and polished. The tool has a nice balance and is a joy to use. It feels good in my hands. Good.

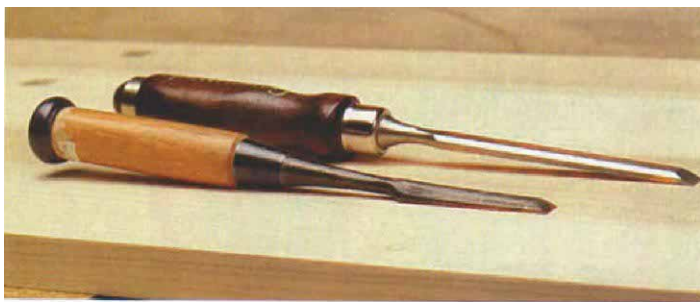
Garrett Wade—This well-balanced, house-brand chisel, made in Czechoslovakia, has an iron-ringed beech handle and is touted in the Garrett Wade catalog as a "superb value." Given the chisel's performance, I'd say they are right. Average.

Harris Tools—I had high hopes for this chisel sporting a cocobolo handle. The blade looks surprisingly like the Garrett Wade house brand, and in fact, both blades bear the marking, "Cr-Mn Steel." An

employee at Garrett Wade said he "believed both chisels are made at the same plant in Czechoslovakia." Average.

Hirsch—This German-made chisel has an eight-sided, steel-banded hornbeam handle. The blade looks remarkably similar to the one in the Two Cherries chisel (above), the only difference being that the Hirsch chisel has a little Elk stamped into the blade near the tang while the Two Cherries chisel has (surprise, surprise) two cherries as its stamp. I called Highland Hardware, a dealer of Hirsch chisels, and was told that the two brands are "made side by side at the same plant." Good.

Iyori—This Japanese chisel arrived very sharp and ready to go from Highland Hardware. The chisel's 11 1/2-in. length felt too long for me, but it would be great for someone who likes long-bladed tools. Excellent.



A Japanese chisel has a curve in the blade. Unlike a Western chisel's blade that is held in a straight line to its handle, a Japanese tool, like the one shown in the foreground, has a slight curve forged into the blade, which lets the blade rest closer to the work.



Hollow-ground back makes for easy flattening. All Japanese chisels have elliptical areas relieved from the back side. With less steel to remove, flattening the back of a Japanese chisel during sharpening is easier.

Japan Woodworker—As is the case with many Japanese chisels, this one came with an unseated strike ring at the end of the handle. Seating the ring is just a matter of giving the end of the handle a few hammer whacks to mushroom the wood around the ring. Unlike the other Japanese chisels I looked at, this one was in the middle of the pack in the toughness test. Average.

Lee Valley—This tool was chipped right out of the package. Once I sharpened it and put it to use, it did moderately well. Balance and feel are good. Average.

Marples Blue Chip—The Marples-brand chisel is the Ford Taurus of chisels; you can find them in lots of catalogs and woodworking stores around the country. But in the toughness test, it did not do as well as most chisels in this review. The molded blue vinyl handle of the 1/2-in. chisel I tested felt comfortable. Average.

Pfeil—I have several friends who own Pfeil carving tools, and they think Pfeil tools are the greatest, so I was looking forward to trying out this Swiss-made chisel. It may be a small point, but this chisel's large-diameter round handle keeps the blade from touching the bench at any point, I found that the chisel was always rolling around on the bench, something that none of the other tools did. This chisel ranked below all others in the toughness test. Average.

Robert Sorby Gilt-Edge—A rosewood handle and a tapered brass bolster make this an expensive chisel that's beautiful to behold. Too bad the steel isn't better quality. Average.

Robert Sorby Octagonal—Another offering from the venerable English toolmaker, this chisel has a brass-ringed, contoured, octagonal rosewood handle. This chisel is beautiful, the balance is

great, and it even has a shock-absorbing leather cushion between the tang and the handle. Average.

Stanley 5002—It looks like a Marples Blue Chip, feels like a Marples Blue Chip, and the blade tested just like the Marples Blue Chip. Average.

Two Cherries—The round, steel-banded hornbeam handle on this chisel has a flat section cut along its length top and bottom, making the tool well balanced and comfortable to hold. Good.

White Steel—In the controlled test, it was hard to tell the difference between this Japanese chisel and the Blue Steel Japanese chisel. A marvelous performer. The White Steel chisel costs a few dollars less than the Blue Steel. I asked the folks at Japan Woodworker about the difference between the two, and I was told that the hand-forging processes were similar, but the steel was different. They said the Blue Steel chisel has a more durable edge and will hold up better in abrasive woods like teak or exotic hardwoods. Excellent.



More than one way to mount a blade. The top chisel is a tang chisel, in which the handle fits around the blunt end of the blade. The handle on a socket chisel fits into the blade (middle). A socket-and-tang chisel (bottom) has a tang forged on the end of the blade that fits into the handle and an auxiliary socket ring at the blunt end of the blade that fits around the handle.

Conclusion

There is no denying the durability of the steel in the three top-scoring Japanese chisels: White Steel, Blue Steel and Iyori. The blades on these chisels were still sharp, and the blade of the White Steel chisel could still shave hair from my arm after the hammer blows. All of the other chisels, good and average performers alike, had rolled and/or chipped edges after the hammer blows.

I'd caution you against rejecting a certain brand of chisel just because it didn't do as well as some of the others in the toughness test. None of the chisels I looked at are junk. The difference between similarly ranked chisels is miniscule. When you're considering buying a new chisel, its balance, its cost and how it feels in your hand are important. If one chisel's blade is not as tough as another's, all that ultimately means is that you'll have to sharpen it more often. And ask yourself this: What's the point of buying a chisel made of super-tough steel if it feels lousy in your hand? □

Rex Alexander works wood and plays music in Brethren, Mich.

ERRATA

Microns or microinches?—"Bench-Chisel Review" (*FWW* #139, pp. 52-57) was an excellent guide to follow in choosing a chisel that represents the best value, i.e., performance vs. cost. The method devised for measuring "toughness" was clever and well-suited to a typical use of a wood chisel.

However, in presenting the data, the article refers to units of measure for the departure from a perfectly smooth edge as "micron inches." There is no such unit. One millionth of an inch (1/1,000,000 in.) is called a microinch. A micron is one millionth of a meter. These are standard, universally accepted definitions. The symbolic identity for the micron is the Greek letter mu (μ). Confusion can arise, however, because machinists in the United States use the microinch as a measure and sometimes express microinches as " μ inches," or μ ", with the μ standing for "the millionth part of and as a shorthand way of writing micro.

-Richard Snedeker, West Windsor, N.J.

EDITOR REPLIES: Mr. Snedeker is correct. There is no such thing as a micron inch. The measurements were made in microinches, much smaller units than microns. The inadvertent error was introduced during the editing process.