

# Sanding

Which brands cut fastest, last longest, and leave the best surface?

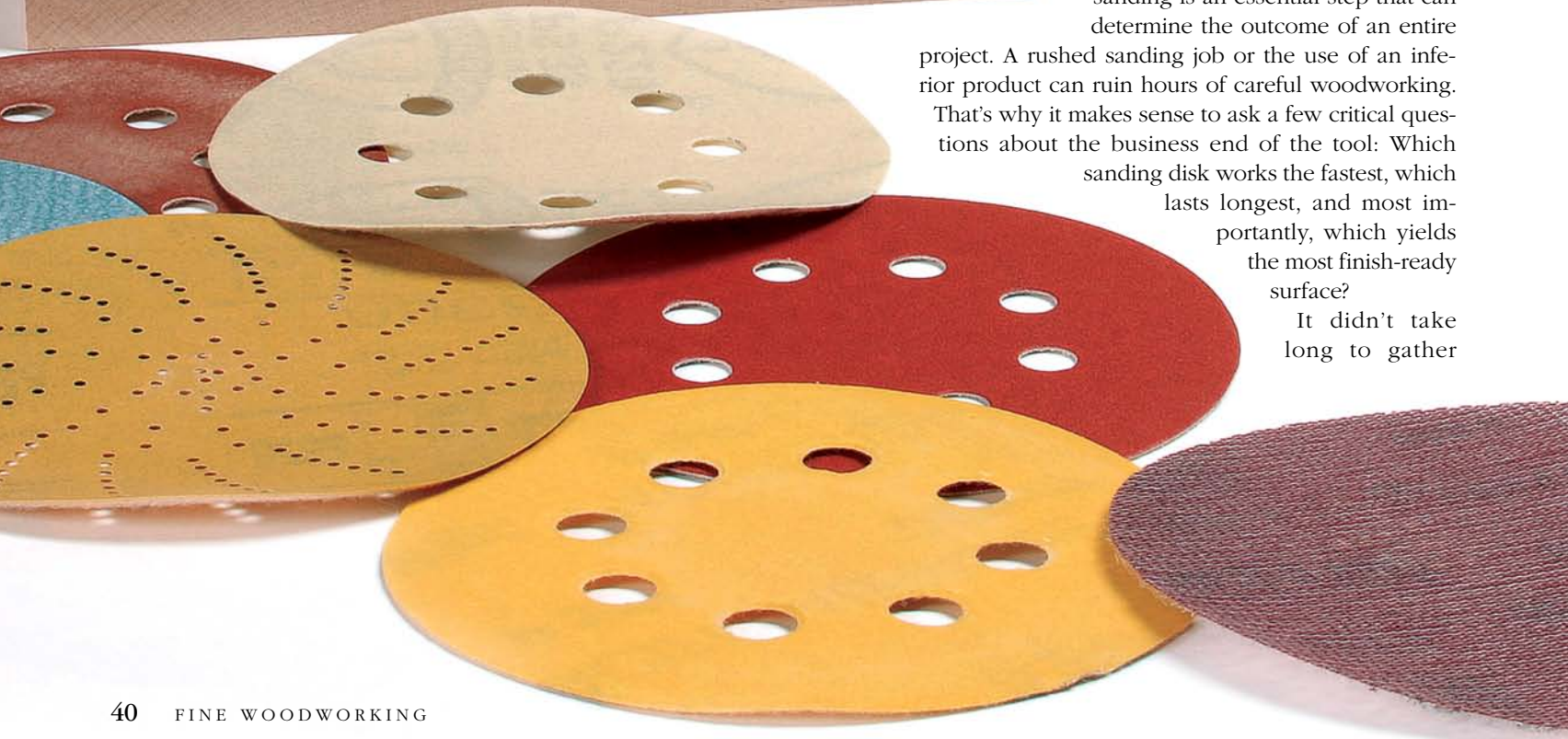
BY ANDY BEASLEY

Whether you work all week in a commercial shop or on weekends in your basement, almost certainly you'll use a random-orbit sander. For any type of wood or grain, it can convert a surface from machine-milled to finish-ready, without requiring a lot of skill. However, I don't know anyone who gets excited about using a sander.

As part of the woodworking experience, it ranks down there with extracting splinters and wiping up spilled glue.

Despite the tedium, however, sanding is an essential step that can determine the outcome of an entire project. A rushed sanding job or the use of an inferior product can ruin hours of careful woodworking. That's why it makes sense to ask a few critical questions about the business end of the tool: Which sanding disk works the fastest, which lasts longest, and most importantly, which yields the most finish-ready surface?

It didn't take long to gather



# Disks

the essential components of my testing laboratory: a Bosch eight-hole random-orbit sander, a Festool variable-suction vacuum, a scale accurate to 1 gram, a pair of anti-vibration gloves, and a comfortable chair. I knew this was going to take awhile.

## How we narrowed the field

I tested the most widely available product lines of 5-in.-dia. hook-and-loop sanding disks: one each from Gator, Grizzly, Norton, Shopsmith, and 3M, and two each from Klingspor and Mirka. I looked at the Premium Gold disks from Woodworker's Supply, but they proved to be one of the Mirka products already in my lineup. I tried four different grits (80, 120, 180, and 220, all on the standard FEPA or "P" scale) representing the range commonly used to prepare wood for finishing.

I selected disks specifically designed to sand bare wood. Except for Norton's ceramic alumina blend, all use aluminum oxide as the primary abrasive. Most feature the common "C" weight paper backing, although the 80- and 120-grit Mirka Gold disks rely on the slightly heavier "D" weight paper, Klingspor's VD980 line boasts the very stiff "F" backing, and Shopsmith uses a wear-resistant plastic film. Mirka's Abranet uses an extremely light and porous polyamide fabric that grabs so well it can cause premature wear of the hooks on a sander's backing pad (which is why Mirka suggests the use of its \$10 "pad saver" disks between the sander and the Abranet). Four product lines—Klingspor's VD900, Mirka Gold, Norton, and Shopsmith—have a stearate coating designed to reduce loading and extend their life.

Most of the products are punched with the common eight-hole pattern that mates exactly with my sander's dust-collection ports. The Norton design is compatible with either five- or eight-hole sanders. The Abranet and 3M "Clean Sanding" disks feature numerous tiny perforations to capture dust. Although this was not a test of dust collection, despite the varied designs, dust collection was excellent across the board.

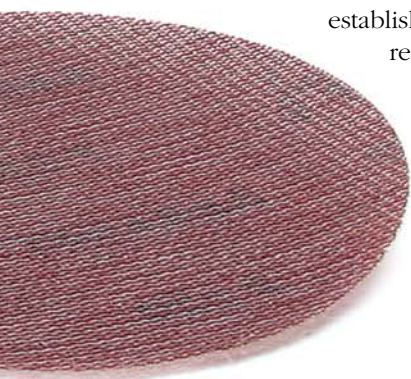
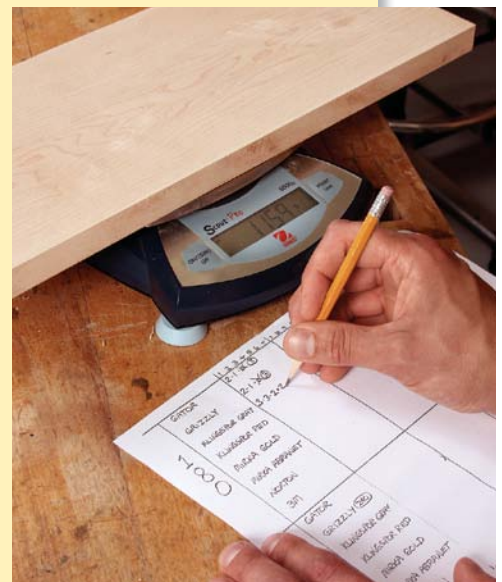
I tested each of the disks the same way, establishing an initial rate of stock removal and stopping when this rate had dropped by 50%. This was a logical time to retire the disk, because in some pre-test sanding on the hard maple, and in a parallel test I did

## Bottom line



**Stock removal varied.** Beasley tested each disk on a pre-weighed board of hard maple. After five minutes of sanding, he weighed the board to see how many grams of wood had been removed. Then he sanded and weighed the board in five-minute intervals until the disk's effectiveness began to drop steeply.

**Surface quality didn't.** After using each 220-grit disk on a section of a cherry board, Beasley applied non-grain-raising dye to one half of each sample and then three coats of a wipe-on poly to the whole board. All the brands left the same appearance.





GATOR

GRIZZLY

KLINGSPOR  
VD900

KLINGSPOR  
VD980

MIRKA  
ABRANET

## TEST RESULTS

Since all of the disks produce similar surface quality, your choice should focus on speed and endurance (and price, of course).

DISK TYPE	ENDURANCE (MINUTES)				TOTAL REMOVED (GRAMS)			
	80	120	180	220*	80	120	180	220*
<b>Gator</b> gatorfinishing.com	15	10	10	10	5	5	3	3
<b>Grizzly</b> grizzly.com	15	25	10	5	9	9	3	1
<b>Klingspor VD900</b> klingspor.com	40	40	20	25	17	19	10	8
<b>Klingspor VD980</b> klingspor.com	20	30	20	10	13	16	9	3
<b>Mirka Abranet</b> mirka.com	15	10	15	10	10	3	5	3
<b>Mirka Gold</b> mirka.com	20	25	10	10	8	11	5	3
<b>Norton 3X</b> nortonabrasives.com	35	10	5	20	15	7	3	9
<b>3M 236U</b> solutions.3m.com	15	10	5	15	5	5	3	5
<b>Shopsmith</b> shopsmithabrasives.com	135	55	20	20	63	20	7	8

\* Grizzly 240 grit

for *Fine Homebuilding* using poplar, almost without exception the amount removed in each five-minute segment was steady for a while and then began a steady decline when the abrasive began to dull. Thus by the 50% point, the disk had already sanded away the majority of the material it was capable of removing.

### Surface quality, speed, and endurance

The cost factor was one of the trickier parts of the test because manufacturers offer different price points for different packages,

depending on the number of disks in each one. Sanding disks in general aren't going to break the bank, so we tossed out the price factor and focused instead on performance. It's important to note though, that you can lower the costs by buying the disks in bulk.

To single out the best product, I weighed three factors: endurance during testing, the total amount of material removed during each disk's lifespan, and the speed with which the disks removed material.



MIRKA GOLD

NORTON 3X

3M 236U

SHOPSMITH

GRAMS PER MINUTE			
80	120	180	220*
0.33	0.50	0.30	0.30
0.60	0.36	0.30	0.20
0.43	0.48	0.50	0.32
0.65	0.53	0.45	0.30
0.67	0.30	0.33	0.30
0.40	0.44	0.50	0.30
0.43	0.70	0.60	0.45
0.33	0.50	0.60	0.33
0.47	0.36	0.35	0.40

**TIP**

**Attach your sander to a vacuum**

When FWW looked at 6-in. random-orbit sanders in issue #202, each machine was tested with both its onboard dust collection and hooked up to a vacuum. With most of the sanders, attaching a vacuum doubled the rate of wood removal (and greatly increased the percentage of dust collected). So for both health and efficiency, everyone should hook a vacuum to their sander, and that's how I tested these disks. It is best to have a variable-speed vacuum. Single-speed models can be so powerful that they suck the sander to the workpiece, slowing the sander, preventing it from spinning randomly, and leaving coarser scratches.

—A.B.

I examined each of the stained maple planks with a magnifying glass under a bright light, and was pleased to see uniformly good results. With a careful sanding technique and a steady progression through the grits, all these products will work well. When I looked at the cherry samples I was reminded why it is not a good idea to dye cherry (especially a figured/blotch-prone board) that has only been sanded to 220 grit. All the sample boards looked bad, and none of the disks reduced or increased the blotching. Under the clear finish, all the boards had a very similar appearance with no scratch pattern visible.

All things being equal in terms of surface

The ultimate purpose of sanding, of course, is to yield a smooth, finish-ready surface that's free of sanding defects. I did a number of tests for surface quality.

To assess the initial scratch pattern, I applied a Minwax wiping stain to the planks that had been sanded with the 80-grit disks, knowing that the pigment would highlight the sanding scratches. Similarly, I stained another set of planks that had been sanded through 220 grit to evaluate the final surface quality.

quality, I chose the winners based on the combination of speed and endurance. Three products stood out here.

The Norton disks proved generally the fastest, while, on average, Klingspor's VD900 series and the Shopsmith disks removed the most material and were the longest lasting. I awarded all three Best Overall. □

*Andy Beasley lives in Colorado Springs, where he's had quite enough sanding to last him for a while.*