

Veritas® Sharpening System

05M02.10

This precision honing guide and angle jig set is a durable and accurate system for sharpening edge-cutting tools. The main frame is a die-casting and the other parts are all machined from brass or steel. For maximum versatility, it should be used with the angle-setting jig.

Why Use a Honing Guide?

A honing guide makes tool sharpening on bench stones easier by letting you accurately control all aspects of blade geometry: the bevel angle, the squareness, the amount of skew, etc. It lets you sharpen consistently to the same result or make a controlled change as desired. It eliminates rounded bevels and substantially reduces sharpening time.

How Do You Use the Guide?

With some minor exceptions, most cutting edge tools are not ready to use in the condition received from the manufacturer. Initial preparation of a chisel or a plane blade takes a bit of time but can avoid much frustration in the long run.

Step 1: Clean the tool to be sharpened.

Many tools come with a coating of lacquer or some form of plastic covering to protect them from rust. This should be removed before sharpening starts.

Step 2: Choose the correct bench stone.

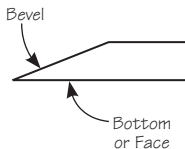
There are two phases to sharpening a cutting tool. The first is to grind the basic bevel angle of the cutting edge. The second is to hone the tool, with as fine a stone as possible, to produce a very sharp cutting edge. The smoothness of the finish and the sharpness of the cutting edge are determined by the grit size of the sharpening stone. The smaller the grit size the finer the finish. A coarse stone is used only for initial shaping of the bevel angle.

Use the following table as a guide.

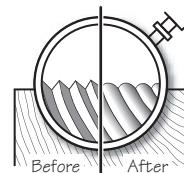
Grit of Stone	Use
100 to 300	Removal of nicks or where a large amount of metal is to be removed.
800 to 1200	Normal shaping of bevel and face.
4000 to 8000	Final honing to produce a sharp cutting edge (bevel and face).

Step 3: Lap the face of the tool.

Since a sharp edge is basically the meeting point of two smooth surfaces, the first thing to ensure is that the face or bottom of any blade is perfectly smooth in the area near the cutting edge before you attempt to hone the bevel.



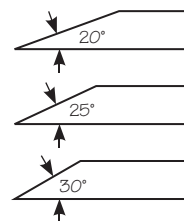
As the tools come from the manufacturer this surface will probably have grinding marks on it that, if not removed, would leave a series of saw teeth on the tool edge if you only paid attention to the bevel side. Such teeth quickly dull or break off in use.



To avoid these saw teeth, the face of the blade must be lapped flat. The easiest way to lap a new blade is on a water stone of 800 or 1000 grit; only on a very wide blade would you have to resort to a coarser stone such as 250 grit. It need not be lapped flat along the entire face, particularly in the case of plane blades, but it should be well lapped near the cutting edge. In this lapping process, be sure to keep this side of the blade flat or you will cause other problems later. When you have the back well-lapped, polish it on a 4000 or 8000 grit stone.

Step 4: Select the bevel angle.

Most chisels and plane blades are ground at a bevel of 25° as they come from the manufacturer. This may or may not be an appropriate angle for your work, depending on how the tool is going to be used. For example, a chisel that would only be used for paring and would never be struck with a mallet could have a bevel angle of 20° or less. At the other end of the scale, a mortise chisel which would be used continuously with a mallet would require a bevel angle of 30° in softwood and 35° or more in hardwood.



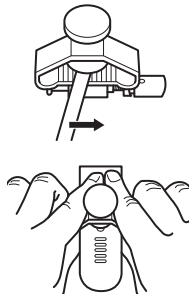
Bevel Angle	Used on these tools
15° to 20°	Paring chisels, skew chisels (including turning skews which are bevelled both sides), low-angle planes for softwood, skew-blade planes.
20° to 25°	All of the above (except skews) for hardwood or end-grain use.
25° to 30°	Chisels used both for paring and light mortising, firmer chisels for softwood, most plane blades (smooth, jack, jointer, etc.) and spokeshave blades.
30° to 35°	Mortise chisels, firmer chisels for hardwood, plane blades for hardwood with pin knots.
35° to 40°	Mortise chisels for heavy use, particularly any with brittle steel.

Step 5: Set up your honing guide / grinding the basic bevel.

Set the pentagon wheel on the angle jig to the angle you have chosen. Pull out the guide setting knob and rotate it so that the arrow points upwards. With the tool loosely fixed in the honing guide, roll up to the wheel until the face of the tool is flush with the pentagon wheel face. Clamp the tool firmly in the guide.



When setting wide chisels or plane blades, the blade will automatically line up squarely in the honing guide because of the combined effect of the wide guide roller and the block reference face. For narrow blades, you may have to check for squareness. After you have firmly clamped a narrow tool at the correct angle, hold the guide and blade up to the light and sight along the edge of the blade, making sure that it is parallel to one of the score lines in the guide base. If it isn't parallel, rotate the blade in the guide until it is. Be sure that the thumbscrew is well tightened. Holding the blade and guide as shown, rub them back and forth on the stone until a satisfactory bevel is formed.



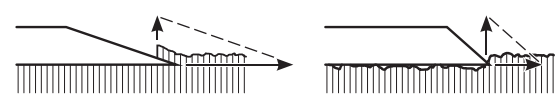
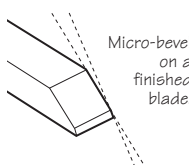
Bevel Angle	Secondary Bevel	
15°	16°	16½°
20°	21¼°	22°
25°	26¾°	27¼°
30°	32°	32½°
35°	37½°	37¾°



You may wish to use the flexibility of the honing guide and angle jig combination to produce a cutting edge to exactly match the conditions you are working with. In general, you want to sharpen any woodworking chisel or plane blade at the lowest possible angle consistent with the strength of the steel and the intended use of the tool. If you think of the tool as a wedge, you know that a gently tapered wedge penetrates material more easily than a sharply tapered one. More force is spent in penetration than in prying apart. As one example, we can look at a chisel paring end grain. The lifting forces and shearing forces exerted on the fibers are directly related to the shape of the chisel tip. Shearing forces sever the fibers while lifting forces encourage fiber breakage and tear-out. Accordingly, to avoid tear-out, you want your bevel angle to be as low as possible to convert as much of the force as possible to the shearing action.

Step 6: Hone a secondary bevel.

The unique feature of the precision honing guide and angle jig combination is that the tool can be quickly and easily honed to a very sharp edge by adding a secondary bevel to the basic guide. Putting a smooth secondary bevel on the tool produces the same result as honing the complete bevel, since only the cutting edge itself has any effect when cutting. Because the guide lets you put on a secondary bevel at only 1° or 2° difference from the primary bevel, you remove less steel but arrive at a sharp edge quickly on your fine honing stone.

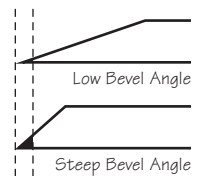


There is a practical limit to reducing the bevel angle. It is determined by the strength of the steel in the tool. You only reduce the angle to the point where the edge will not crumble or bend in use. This angle is usually between 15° and 20° for light paring. Since even tools from the same batch and same manufacturer can vary slightly in hardness, the lowest practical angle will vary from tool to tool.

To hone a secondary bevel, turn the setting knob so that the arrow points forward (for a 1° difference) or down (for a 2° difference) and transfer to your finishing stone. A secondary bevel of 1/16" is sufficient. The table below shows the angle of the secondary bevel at specific positions of the setting knob.

For general-purpose tools that will be used both for paring and light mortising, the limit is usually about 25° in softwoods and 30° in hardwoods.

There is a second reason for keeping bevel angles low. As a tool begins to lose its edge, one with a low bevel angle does not dull as quickly as one with a steep bevel angle. Dulling is really just thickening of the cutting edge. The edge thickens with wear in relation to the bevel angle. The diagrams overemphasize the effect but still make the point.



For plane blades, the higher the pitch of the plane, the steeper the bevel angle should be for strength. For a smooth plane with a 50° pitch to work in hardwoods, the bevel angle should be about 30°. For a low-angle block plane, a bevel angle of 20° would be more desirable. In general, you should choose the lowest bevel angle that is consistent with the retention of sharpness (i.e., the angle at which the edge will not fold or crumble in use). The various angles previously described are guidelines but can be adjusted according to the alloy and the hardness of the particular tool you are working with.

There are five different shaping and honing angles available using one block setting angle. For example, if you want to shape at 25° and hone at 26³/₄° or 27¹/₄°, set the cam indicator arrow in the up position before you fix the tool in the guide as previously shown. You can then grind the basic bevel at 25° and turn the cam to the horizontal position to hone at 26³/₄° or to the down position to hone at 27¹/₄°. If you wanted to grind at 23° and hone at 24¹/₂°, you would turn the indicator to the down position when clamping and then flip it to the up position before you grind the basic bevel. When the down position is 25°, the horizontal position is 24¹/₂° and the up position is 23°. In this manner you can use any of the angles shown in the table.

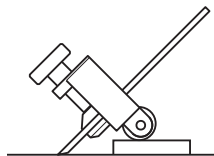
13 ³ / ₄ °	14 ¹ / ₂ °	15°	16°	16 ¹ / ₂ °
18 ¹ / ₄ °	19 ¹ / ₂ °	20°	21 ¹ / ₄ °	22°
23°	24 ¹ / ₂ °	25°	26 ³ / ₄ °	27 ¹ / ₄ °
27 ¹ / ₂ °	29 ¹ / ₂ °	30°	32°	32 ¹ / ₂ °
32 ¹ / ₂ °	34 ¹ / ₂ °	35°	37 ¹ / ₂ °	37 ³ / ₄ °

The great advantage of this system is not only that you can set a tool in the guide at any of these angles whenever you wish but you can return to exactly the same angle to resharpen. This not only makes the sharpening faster but it reduces tool wear caused by needless reshaping of edges.

Honing Higher-Angle Micro-Bevels

As you increase the cutting angle, you will quickly become aware that it is noticeably more difficult to push the plane. We therefore recommend beginning with the 38° micro-bevel and gradually increasing it until the tear-out is eliminated or minimized.

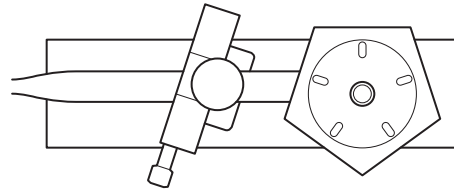
Begin by setting the blade in the guide for a 35° bevel with the guide setting knob in the up position. To obtain the desired micro-bevel angle, use the appropriate spacer block (see chart) underneath the roller. The spacer can simply be a block of hardwood. It is important that the top surface of the spacer block be parallel to the top surface of the honing stone or plate. If not parallel, the micro-bevel will have a skew to it. Once set, mark the guide setting knob, when moved to the horizontal position, will increase the micro-bevel angle. The spacer will limit the travel of the honing guide, allowing only short strokes; however, this is not an issue as a micro-bevel of 1/16" is sufficient.



Spacer Thickness	Up Position	Horizontal Position
1/8"	39 ¹ / ₂ °	42°
1/4"	44 ¹ / ₄ °	46 ¹ / ₂ °
3/8"	49°	51 ¹ / ₂ °
1/2"	54°	56 ¹ / ₂ °

Special Set-Up For Skew Blades

For setting a skew blade, fix the blade loosely in the jig and slide it under the setting block until the cutting edge fits snugly against the base. You may have to rotate the setting block slightly to keep the honing guide on the base plate.



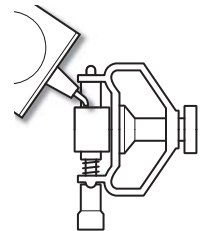
When you feel that the skew blade is well seated at the edge, lift the blade until it fits flush against the block face. Let the honing guide find its own position (which will be parallel to the skew edge, the same as it would be parallel to a square edge) and then clamp the blade. If you let the guide find its own most comfortable position when it is loose, you can then clamp it securely to the blade. Take a light pass on the stone to see if any minor adjustment is necessary. Usually it is not necessary unless you are working with a very narrow blade.

As you hone a skew blade, let the blade and guide follow a gentle arc on the stone. If you force the guide straight ahead, you could cause the roller to skid sideways, which will put a flat on the roller. You will find that the arc is so gentle that honing is still easily done. Grind the tool as shown until a satisfactory bevel is formed.

Honing Guide Maintenance

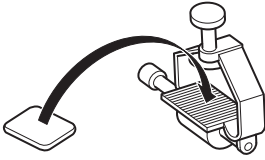
Your honing guide needs to be oiled frequently. The machining tolerances are very close on this guide to make it as accurate and as durable as possible. Since the guide is exposed to water and abrasive particules in use, fine particles can get between the roller and the cam, which may interfere with smooth operation.

To avoid this, flush the roller and cam with water after each use, dry, and apply a drop of oil to the junction of the roller cam. Work the roller with your fingers to ensure that the oil is well distributed inside. It is also important to keep the surfaces of your sharpening stones true, not only to produce accurate edges, but to avoid uneven wear to the guide roller. To true your stones, lap them on silicon carbide paper.



High-Friction Pad Option

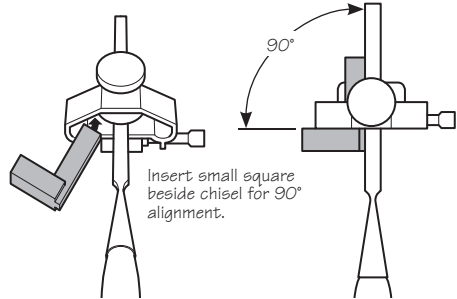
Supplied with your honing guide is a high-friction pad that you can install on the bed of your guide if you want to. The pad has a "peel and stick" backing with a special rubber adhesive that takes 72 hours to cure fully after application. You can still use the guide during this period, but take care not to lift a corner of the pad.



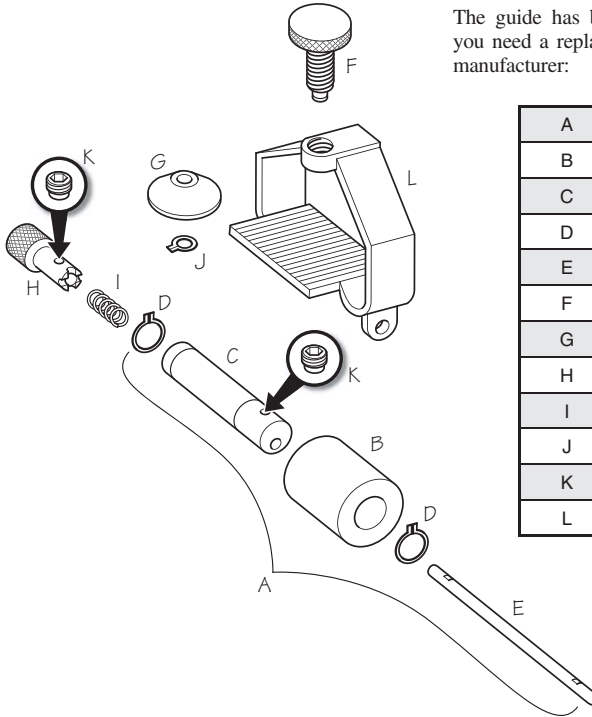
The pad will cover the alignment guide lines on the honing guide so the alignment of narrow chisels should be checked with a small square (as shown in the diagram) using the rear face of the guide as a reference source.

Honing Guide Adjustment

You can dis-assemble your honing guide by removing the cam grub-screw and the various retainer clips if you wish. Should you do this at any time, be sure that you lock the cam grub-screw properly when you re-assemble. The cam grub-screw should be aligned with the grub-screw in the setting knob before tightening. This ensures that the cam maximum and minimum heights correspond with the arrow on the setting knob.



The guide has been made so that all parts are replaceable. If you need a replacement part, you can order it directly from the manufacturer:



A	Complete Roller Assembly (B,C,D,E)
B	Roller
C	Eccentric Cam
D	Retaining Ring (0.370°)
E	3/16" Shaft
F	Clamping Screw
G	Clamping Pad
H	Setting Knob
I	Spring
J	Retaining Ring (0.250°)
K	Grub-Screw
L	Frame

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