

U.S. Pat. No. 7,553,216

This Veritas® Mk.II Standard Honing Guide is an all-in-one system for sharpening edge-cutting tools. The great advantage of this system is that it has everything you need to precisely set primary bevel angles for high-angle and standard-angle blades, as well as back bevels. The ranges are numbered and color-coded for clarity and ease of use. The registration jig not only squares the blade in the carrier, but also sets the appropriate blade projection for the desired bevel angle. It lets you sharpen consistently to the same result or make a controlled change, as desired. This not only makes tool sharpening on bench stones and surface plates faster, but also reduces the wear caused by needless reshaping of edges.

This honing guide can be used to sharpen flat or tapered blades up to $27/8$ " wide and $15/32$ " thick in the standard-angle configuration. (The thickness is limited to 0.254" in the high-angle configuration and to 0.282" in the back-bevel configuration.) Our eccentric roller makes it easy to create a micro-bevel without resetting the blade in the guide.

The main components are die-cast zinc/aluminum alloy and the other parts are all precision machined from brass or steel for durability and accuracy.

Note: Before using the honing guide, apply a drop of oil to the junction of the roller, as shown in **Figure 13**.

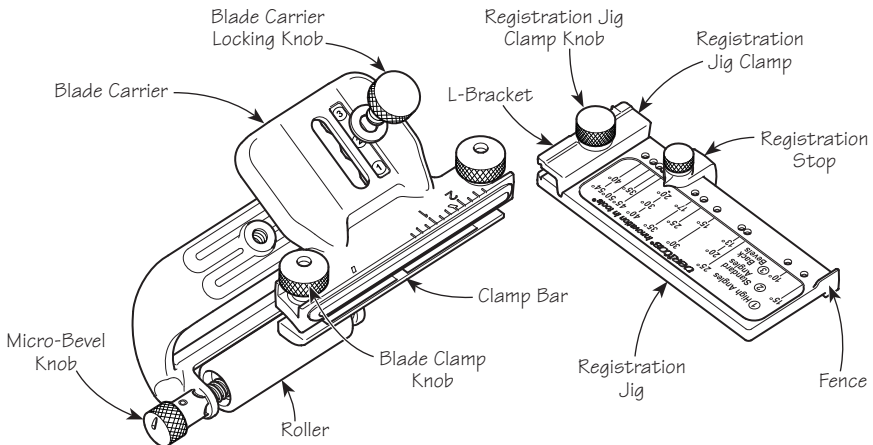


Figure 1: Mk.II honing guide components.

Step 1: Lapping

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.

An easy 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 the face of the blade flat; otherwise, you could gouge the face of the blade or create an unintentional back bevel. When you have the back well lapped, polish it on a 4000 or 8000 grit stone.

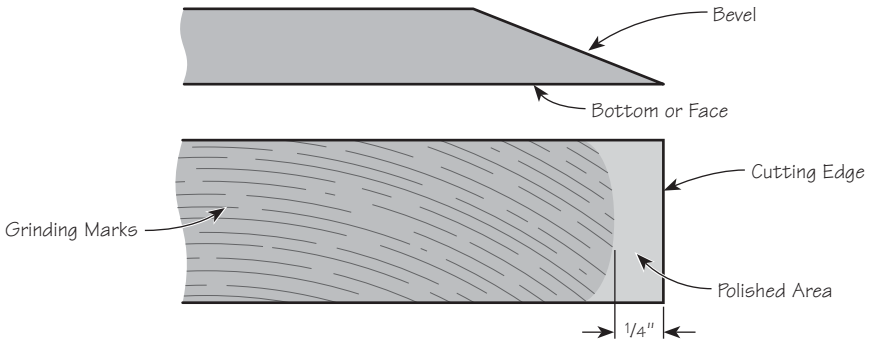


Figure 2: Lapping the face.

Step 2: Setting the Honing Guide

This honing guide can be set to one of three bevel angle configurations. These are numbered and color-coded for clarity and ease of use (see **Figure 3**).

- Position ① (red) for high angles,
- Position ② (yellow) for standard angles and
- Position ③ (green) for back bevels.

Loosen the blade carrier locking knob, then lift and slide the blade carrier to the required position. For example, if you are honing angles between 15° and 40°, set the blade carrier to the ② (yellow) location.

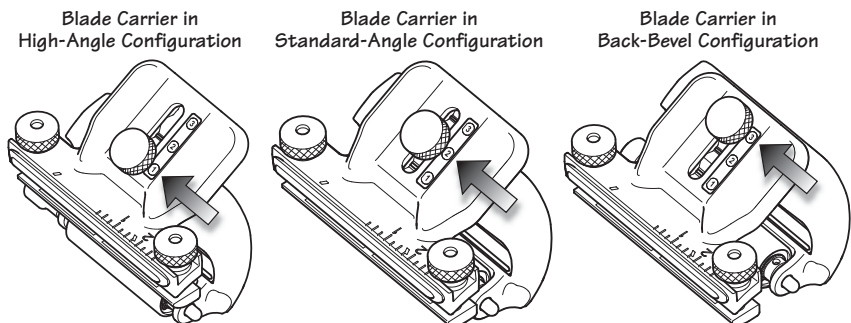


Figure 3: Configurations for different bevel angle requirements.

You will notice a significant overlap in the bevel angles marked on the registration jig. There is no particular disadvantage to using either configuration unless your blade is particularly short (butt chisels for example), for which it may not be possible to achieve a lower bevel angle at the high-angle configuration.

Step 3: Setting the Registration Jig

The registration jig ensures your blade is centered and squared in the blade carrier and sets the blade projection for the desired bevel angle.

Slide the registration jig onto the dovetail feature along the front of the blade carrier. Set the registration jig such that the pointer on the top jaw of the jig aligns with the approximate width of your blade on the scale on the top of the blade carrier (see **Figure 4**). Tighten the registration jig clamp knob only finger tight. Do **not** overtighten as it is desirable to have some up and down movement of the registration jig to allow it to easily slide off the blade when loosened.

Set the registration stop to the desired bevel angle, aligning it with the scale of your choice. The registration stop in **Figure 4** is set for a 1" wide blade and a 30° bevel angle using the ② (yellow) standard-angle configuration.

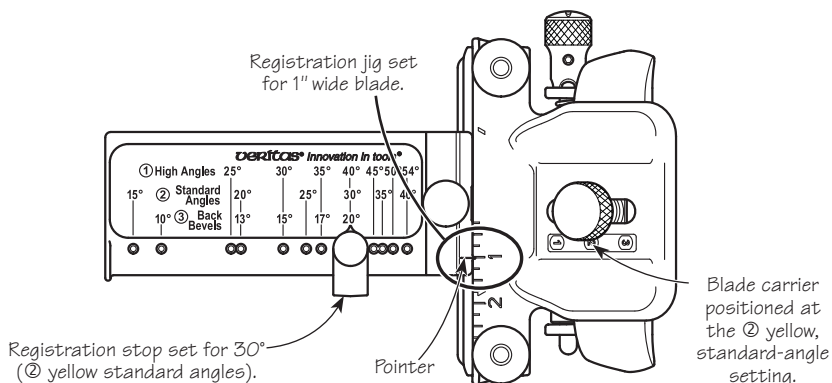


Figure 4: Registration jig installed.

Bevel Angle	Used on these tools
<15°	Back bevels.
15° to 20°	Paring chisels, skew chisels (including turning skews that 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.
>40°	Scraper plane blades and bevel-up smoothing planes used on wood with difficult/reversing grain to produce Type II wood chips.

Step 4: Installing the Blade

For reliable results, the blade **must** be properly installed in the guide.

Loosen the two blade clamp knobs on the blade carrier. Open the clamp bar wide enough to slide the blade in. The knobs **must** be loosened and tightened in **small** increments. **Do not** tighten or loosen one side substantially more than the other; otherwise, the clamp bar or knobs may jam.

Hold the honing guide upside down, and slide the blade in the honing guide such that it bears against the fence on the registration jig and just barely touches the blade stop (see **Figure 5**). The blade will be centered in the honing guide. The resulting bevel angle will be accurate, and the edge square to the side of the blade. **Hand tighten the knobs firmly and evenly**. The clamp bar must be parallel to the upper jaw to effectively secure the blade.

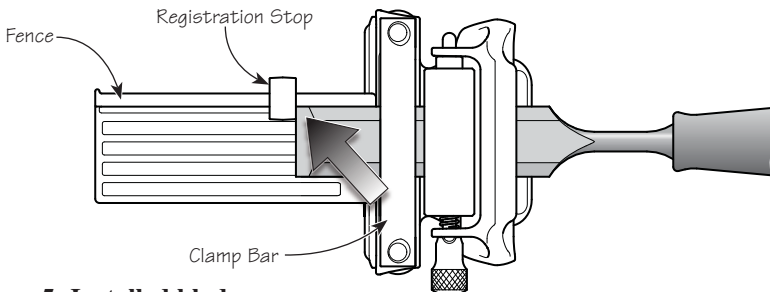


Figure 5: Installed blade.

Loosen the registration jig clamp knob and slide the registration jig off of the blade carrier. Check that the blade clamp knobs are still tight after removing the jig to ensure the blade doesn't inadvertently shift in use.

Step 5: Honing the Primary Bevel

Ensure that the micro-bevel knob is set to the 12 o'clock position (as shown in **Figure 6**). The spring-loaded knob is easy to adjust by pulling it out of the body just enough to allow rotation of the pointer to the desired position.

Roll the guide and blade back and forth on the abrasive surface until a satisfactory bevel is formed, ensuring that any downward force is applied mainly to the edge of the blade. Since the roller maintains the angle, it should be in contact with the stone at all times. If the roller is lifted off the stone, the very edge of the blade will have a higher bevel angle than the one selected.

The primary bevel should extend at least 1/8" back from the edge.

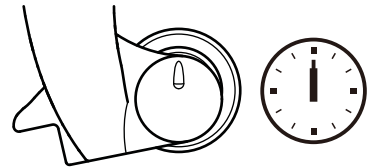


Figure 6: Micro-bevel knob set for honing primary bevel.

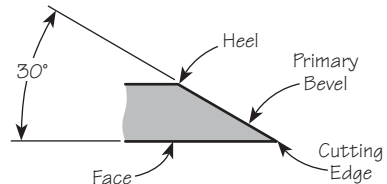


Figure 7: Primary bevel.

Step 6: Honing the Micro-Bevel

One of the features of the honing guide is that the blade can be quickly and easily honed to a razor-sharp edge by adding a micro-bevel (or secondary bevel) to the primary bevel. A smooth micro-bevel on the blade produces the same result as honing the complete bevel, since only the cutting edge itself has any effect when cutting. You remove less steel, but arrive at a sharp edge quickly. With the micro-bevel knob in the 6 o'clock position, you will obtain a micro-bevel with a 1° to 2° difference from the primary bevel.

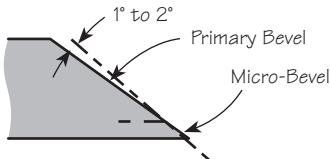


Figure 8: Micro-bevels.

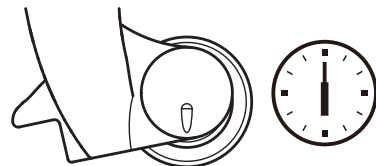


Figure 9: Micro-bevel knob set for honing the micro-bevel.

Back Bevels

Back bevels are low-angle bevels applied to the back of a plane blade. There are two major reasons to apply a back bevel, and these depend on the type of plane blade.

On a bench plane (where the blade is mounted bevel down), a back bevel is used to increase the effective cutting angle from the otherwise fixed 45° of the plane bed. This is useful when working wood with highly figured and/or reversing grain. The back-bevel angle will need to be tailored to the particular situation; however, the following chart may be used as a starting point:

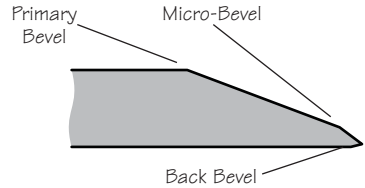


Figure 10: Bevels on a plane blade.

Back-Bevel Angle	Effective Cutting Angle	Application
10°	55°	Difficult/reversing grain in softwoods (such as pine) and slightly figured/reversing grain in more difficult hardwoods (e.g., oak, ash and maple).
15°	60°	For all but the most difficult woods. Usually required for woods like oak with very severe grain fluctuation, crotch figure as well as near knots and bark inclusions.
20°	65°	To minimize tear-out on the most difficult woods.

On a low-angle plane (where the blade is mounted bevel up), a back bevel is used to increase the included bevel angle without affecting the effective cutting angle. The purpose of this is to increase the durability of the edge, particularly when working end grain. For this application, very low back-bevel angles must be used to maintain adequate relief angle behind the edge.

To create back-bevel angles of 10° or higher, simply set the blade carrier in the ③ (green) back-bevel configuration and the blade registration stop on the ③ (green) scale. Install the blade with the primary bevel up (as shown in **Figure 11**), and the micro-bevel knob in the 12 o'clock position.

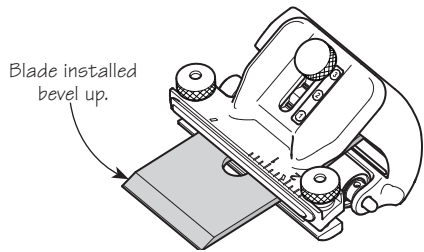


Figure 11: Configuration for honing back bevels.

Back bevels should extend no more than 1/32" back from the edge; a few passes on the abrasive surface should be sufficient to achieve the desired effect. A large back bevel will offer no advantages and will require a lot of material removal from the micro-bevel, should the need arise to remove the back bevel.

Important Note: In the back-bevel configuration, the indicated bevel angle is dependent on blade thickness. The settings on the registration jig have been calibrated for a 1/8" thick blade. Blade thickness does not have a large effect on bevel angle, and a blade 3/16" thick will have a bevel angle varying less than 1° from the registration jig setting.

For a back bevel of 9°, simply remove the registration stop and use the end of the registration jig as a reference. To remove the stop, first loosen the registration jig clamp knob, withdraw the registration jig clamp, then slide the stop from the registration jig. Re-install the registration jig clamp and clamp knob.

To obtain back bevels of less than 9°, you will need to set the micro-bevel knob in the 6 o'clock position and use a spacer block (see table below for required offset) 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 with the top of the abrasive surface. If not parallel, the back bevel will have a skew to it. Once set, mark and save the block for future use. The spacer will limit the travel of the honing guide, allowing only short strokes; however, this is not an issue as a back bevel of 1/32" is sufficient.

Offset*	Back-Bevel Angle	Registration Stop Location
5/8"	8.5°	① (red) high angle 45°
5/8"	7°	① (red) high angle 35°
5/8"	6°	① (red) high angle 30°
5/8"	5°	① (red) high angle 25°
5/8"	4°	② (yellow) standard angle 15°
13/16"	3°	① (red) high angle 30°
13/16"	2°	② (yellow) standard angle 15°

***Note:** The offset is the space you have to create between the spacer and the abrasive surface. The thickness of the spacer depends on the thickness of your abrasive material.

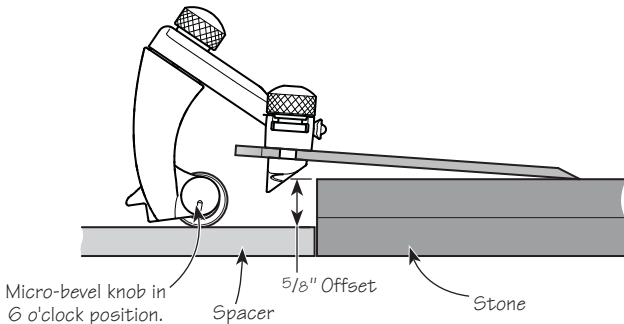


Figure 12: Set-up for very low-angle back bevels.

Setting Other Angles

The blade stop on the Veritas® Mk.II Honing Guide's registration jig has discrete positions for preset bevel angles, providing quick, accurate sharpening and perfectly repeatable results. The registration jig not only squares the blade in the carrier, but also sets the appropriate blade projection for the desired bevel angle. The angles specifically marked on the jig represent the most common blade angles you will encounter on manufactured chisels and plane blades. But that doesn't mean the honing guide can't handle other angles. On the contrary, by mixing configurations and settings, the honing guide can yield just about any bevel angle.

Honing Guide Maintenance

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

We recommend that you flush the roller with water, dry it and apply a drop of oil to the junction of the roller, as shown in **Figure 13**, every few times you use it. Work the roller with your fingers to ensure that the oil is well distributed inside. As grit from the sharpening process eventually fouls the clamping screws, they should be cleaned and oiled occasionally as well.

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 on a flat surface or use silicon carbide grit on a piece of glass (or steel lapping plate). Add a shot of oil (for oil stones only) or water (for water stones only) and lap them flat.

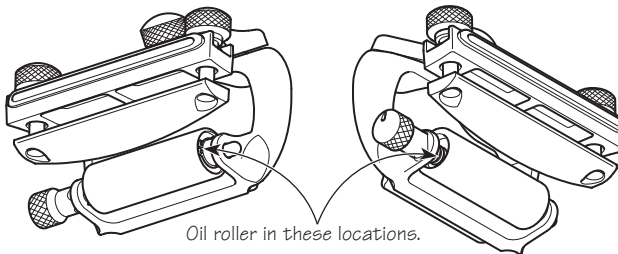


Figure 13: Locations to oil roller.

Accessories

05M09.03 Skew Registration Jig

05M09.05 Camber Roller Assembly

05M09.09 Narrow-Blade Head

05M09.10 Mk. II Narrow Blade Honing Guide