The Tormek Way of Sharpening

The Tormek System

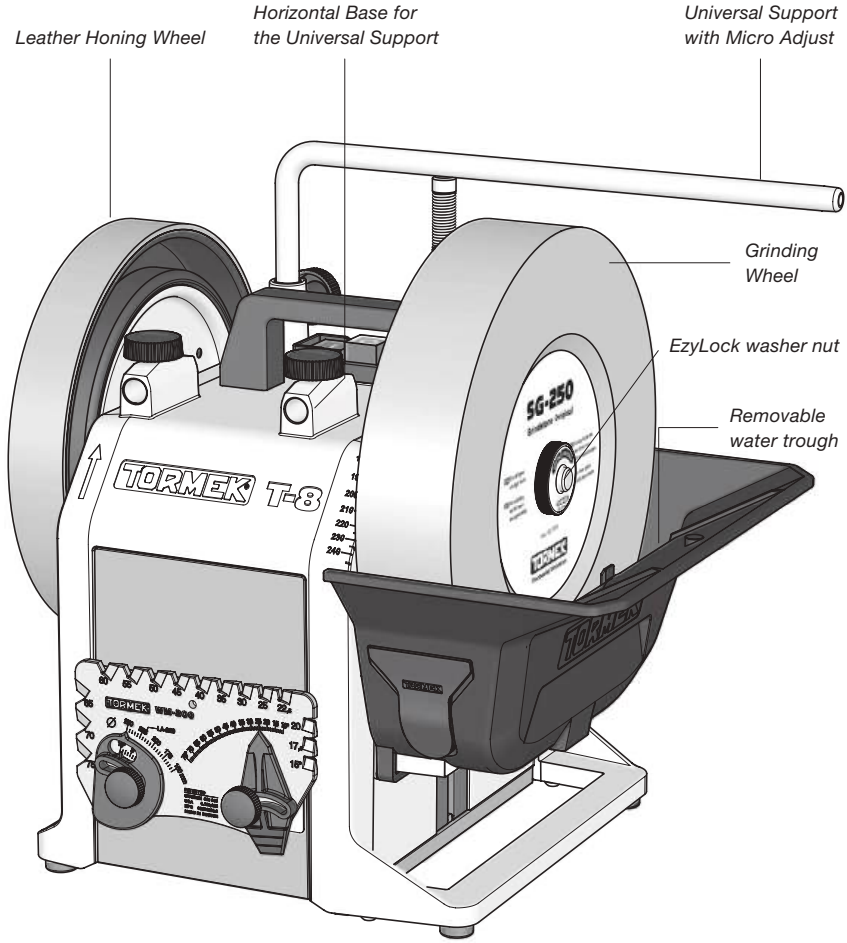
With the Tormek method you do not use a conventional bench grinder for the grinding, coarse benchstones for the initial sharpening or fine benchstones for the fine sharpening/honing.

You do both the initial grinding (when you shape the tool and create the optimal edge angle) and the sharpening on the same grindstone. The Tormek Original Grindstone can easily be changed from fast grinding to fine sharpening. The grinding/sharpening is carried out with water cooling, so there is no risk of burning the edge and drawing the hardening from the steel. The honing and polishing is carried out on a leather honing wheel. The surface of the grindstone can easily be maintained flat and true with the Tormek Truing Tool.

The grinding and sharpening on the grindstone as well as the honing and polishing on the leather honing wheel is controlled with uniquely designed jigs. This means that you have full control of the grinding, sharpening and honing angles. By means of a patented AngleMaster you can exactly pre-set the edge angle which you have selected.

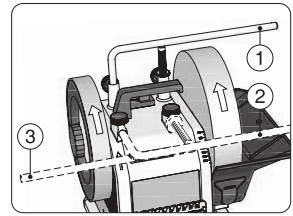
Precise replicate sharpenings are possible. Once you have ground your tool to the desired shape and edge angle, you can easily reproduce exactly the same shape with all future sharpenings. This is even possible for “difficult” tools with special shapes such as fingernail turning gouges, spoon shaped woodcarving gouges and oval skew chisels with a curved edge. Because of the exact repeatability, you remove very little material and therefore the sharpening is completed quickly. The result is that the lifetime of your tools is considerably prolonged.

The fact that you exactly can replicate the shape of an edge is a great advantage when working with a tool. You can continue with exactly the same turning and cutting technique you have learned for the specific tool, as it has not changed its shape and cutting characteristics.



The illustration above shows Tormek T-8 Original. Its predecessor T-7 and the smaller Tormek T-4 model works in the same way and uses the same range of jigs and accessories.

Tormek Universal Support

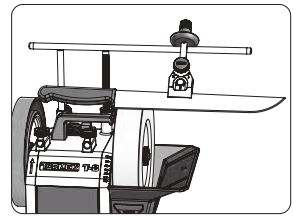


The versatile Tormek Universal Support is the basis of the Tormek system. It is made of 12 mm (½") round steel and has a dual mounting for maximum stability. It has a micro adjust for an exact and easy fine setting. It can be positioned for grinding either vertically (1) or horizontally (2) or for honing (3), see page 40.

It has the following functions:

- Support for the grinding jigs.
- Support for the Truing Tool, TT-50.
- Tool rest when grinding without jigs.
- Rest for your hands when grinding free-hand.
- Rest for your hands when grading the stone with the Stone Grader, SP-650.

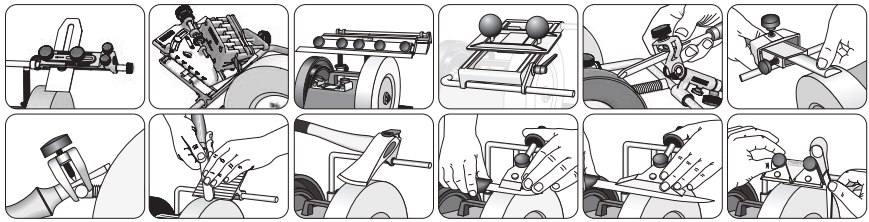
Tormek Universal Support Extended



Tormek Universal Support US-430 is both longer and higher than the original universal support. The universal support is designed for sharpening long tools, such as long knives, cleavers and machetes. Micro adjust with scale for precise setting of edge angle. Length: 436 mm (17⅝"). Height: 212 mm (8$^{11}/_{32}$").

Tormek Grinding Jigs

Tormek has developed jigs for the accurate and safe grinding of most edge tools. With these jigs you can grind the tools at exactly the angle you want and achieve a perfect edge in a short time. The grinding is controlled and always takes place at the correct angle for each tool.



Safe

At the low speed of the Tormek grinding wheel, you can fully control the grinding operation. No sparks are produced and the steel and grinding wheel particles are transported by the water into the water trough. Tormek machines are tested and approved according to Semko, CSA and UL standards, depending on the model and country. Please refer to the marking on your machine or the safety instructions that came with your machine.

Tormek Original Grindstone

The Tormek Original Grindstone SG-250 has been developed to run in water at low speed. The stone grinds effectively and gives a fine finish to the bevel. It quickly grinds large tools for example plane irons, axes, scythes and even HSS steel. The grit rating is 220 and the grain size is 0.06 mm (0.0024"). The stone can be graded with the Tormek Stone Grader SP-650 to a finer surface corresponding to 1000 grit suitable for fine grinding/sharpening.

The special structure of the grindstone combined with the continuous flushing over the edge make that the surface does not become clogged by residual steel particles from the tool or worn stone particles.

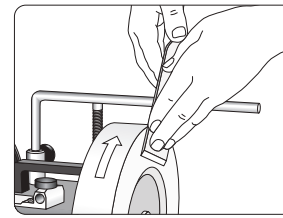
Since it is not possible to incorporate the fastest steel removal and the finest surface finish in one stone, Tormek has developed two stones to cope with special needs; the fast grinding Blackstone Silicon and the fine Japanese Waterstone (page 154). There are also three diamond wheels available; Diamond Wheel Coarse, Diamond Wheel Fine and Diamond Wheel Extra Fine (p. 155).

Perfect Visibility of the Sharpening Process

Because the grinding wheel runs slowly in water and no sparks are produced, there are no eye shields on the machine. This means that you can clearly see and control the sharpening process.

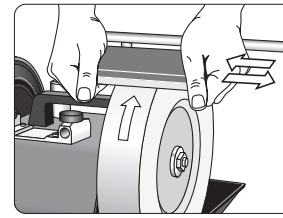
Flat Surface

The outside of the stone is machined flat and has a depressed centre so the grinding surface does not interfere with the washer and nut in the centre. This surface is reserved for flattening the back of plane irons, wood chisels and similar tools.



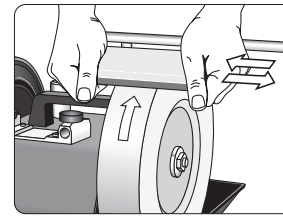
Grinding and Fine Sharpening

With the Tormek Stone Grader, you can do both the initial fast grinding and then the fine sharpening on the same stone with an identical setting of the grinding jig. The sharpening is done at exactly the same angle as the initial fast grinding (page 140). It works on the Original SG-250 stone and the Blackstone Silicon SB-250. On the Japanese Waterstone the fine side of the Stone Grader is used for cleaning the surface. Diamond Wheels shall never be trued.



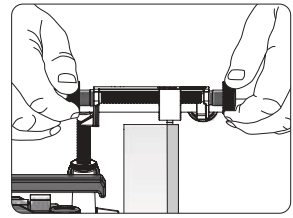
Always an Efficient Grindstone

With the Tormek Stone Grader you can reactivate the grindstone easily so fresh grains are exposed on the surface and the stone is always effective. This is a benefit when grinding hard HSS steel with a large grinding surface, e.g. electric planer/jointer blades (page 140). The reactivating works on the Original Stone SG-250 and on the Blackstone Silicon SB-250.



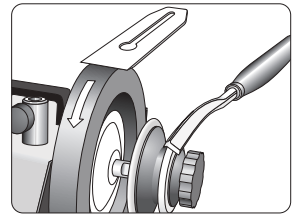
Always a Smooth Running Grindstone

A grindstone can, after a period of use, become uneven on its surface and run out of true. With the Tormek Truing Tool you can easily restore the stone to an exact roundness while the stone runs normally on the machine. Please see the chapter TT-50 (page 138).



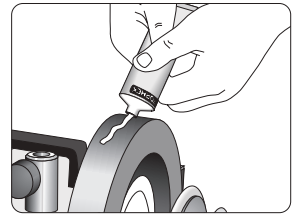
Tormek Leather Honing Wheels

After grinding, a burr appears on the edge. You gently hone away this burr on the Tormek Leather Honing Wheel to leave a razor sharp edge. As an accessory you can fit a smaller and profiled wheel for honing the inside of gouges and V-tools (page 44).



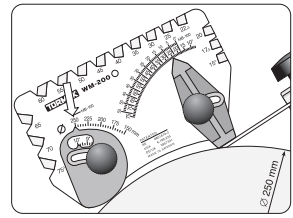
Tormek Honing Compound

If you use the Honing Compound on the Leather Honing Wheels, you achieve a still finer surface. The edge is polished to the highest lustre, giving you the finest cutting edge (page 44).



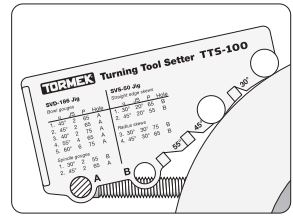
Pre-set Edge Angle

With the Tormek AngleMaster you can set the jigs so that your tools will have the edge angle of your choice. It also measures the edge angle. Please see the chapter on the WM-200 (page 142).



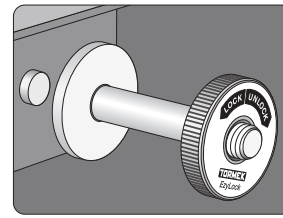
TTS-100 Turning Tool Setter

For instant replication of the shapes on turning gouges and skews when using the SVD-186 R Gouge Jig and the SVS-50 Multi Jig. With built in edge geometries recommended by experienced woodturners. Thanks to the patented design it works on any grinding wheel diameter.



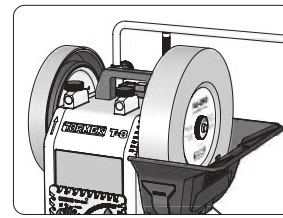
EzyLock for Mounting the Grinding Wheel

With the Tormek EzyLock (pat. pending), which is both a nut and a washer, you need no tools for mounting and dismounting the grinding wheel. The special thread causes the rotation of the wheel to tighten the nut to the right torque. No tools are needed when mounting and dismounting the wheel (page 161). The shaft, washer and EzyLock washer nut for the grinding wheel are stainless steel.



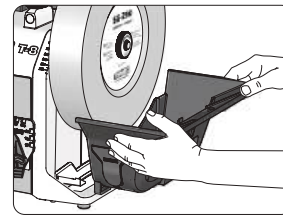
Ultimate Precision

Vital functions like the motor and the main shaft are mounted in the zinc cast top, which includes the integral sleeves for the Universal Support. This advanced design ensures an unbeatable precision for the Universal Support, which is the foundation of the Tormek jig system.



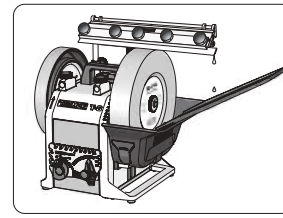
Removable Water Trough

When sharpening, the tool is continuously rinsed by water, which cools the edge. The water also works as an effective lubricant, which gives a finer finish to the tool and transports worn particles from the wheel and the steel into the water trough. The water trough can easily be lowered and removed for emptying and cleaning.

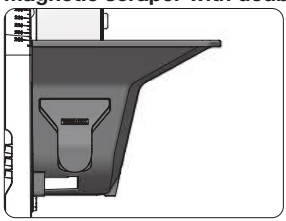


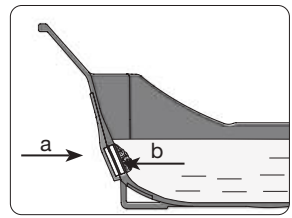
Water Chute for Long Tools

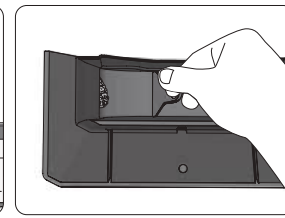
For long tools that drip water over the edge of the lip (like chef's knives and planer blades), you can add the water chute. Set the widest edge of the chute onto the tab in the middle of the lip of the trough and the water chute will direct the water back into the trough from even the longest tools. (The model T-4 has no separate water chute.)



Magnetic scraper with double function



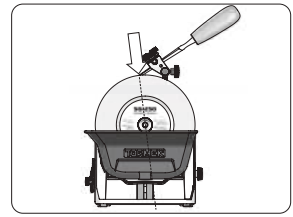




The removable scraper incorporates a strong magnet (a), which attracts the steel particles ground from the tools being sharpened (b). This keeps your grinding wheel clean and cutting more freely. These small steel particles would otherwise be pressed into the wheel's surface and can affect the sharpening. When you clean the water trough, you'll find that most of the steel will be located on the magnet. When you remove the scraper, the magnet will release the steel particles and you can easily clean the trough. (The T-7 has an integrated magnet in the through. The T-4 has no magnet).

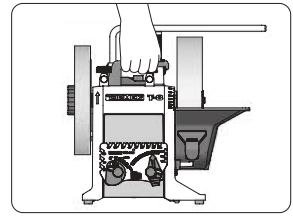
Sturdy Construction – High Stability

The machine remains steady when grinding due to the rubber feet and does not need to be fixed to the workbench. The downward force exerted when the Universal Support is placed vertically, further stabilizes the machine.



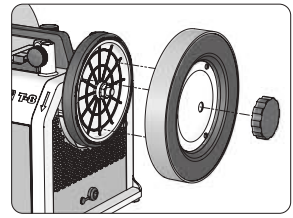
Easy to Move and Carry

The machine has a convenient handle, which makes it easy to move and carry. This is an advantage for site work and can save space in a confined workshop. (The Tormek T-3 has no handle.)



Quick Coupling for the Honing Wheel

The quick coupling enables you to remove the honing wheel when grinding large tools, e.g. long knives, axes or scythes. (The Tormek T-4/T-3 has no quick coupling).



Continuous Operation

The single phase motor is the highest industrial quality and is rated for continuous operation. (The Tormek T-4/T-3 is rated for 30 min/hour.)

Quiet Running

The Tormek machine run very quietly thanks to the silent induction motor and the patented friction drive.

No Grinding Dust

No sparks are produced and the steel and grinding wheel particles are transported by the water into the water trough. Therefore you get no dust in the air and around the machine, which is better for your lungs.

Preparation Before Grinding

Working Height

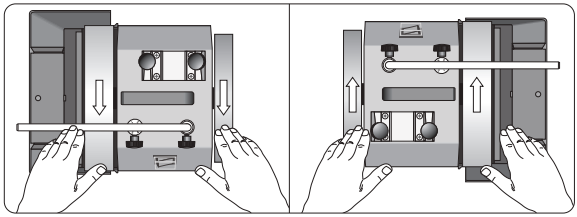
Place the machine on a stable surface at a convenient height. This depends on the type of grinding operation and of course on your height. At knife sharpening the height of the bench should be 750–830 mm (29½–32⅔"). You can also sit on a chair for certain operations, e.g. when grinding scissors or when using the MB-100 Multi Base.

Light

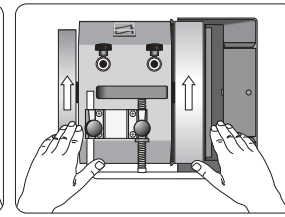
Ensure that you have satisfactory light, so that you can see clearly and can control the grinding process in detail. A perfect light is absolutely necessary when you grind small and delicate woodcarving tools.

Positioning of the Machine

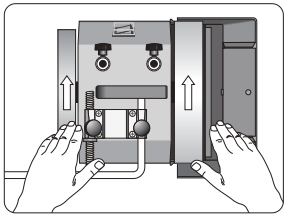
The machine has no front or back side – it is designed to be operated from either side depending upon the optimal function of each grinding and honing operation. In the instructions there is a recommendation of the best position for each tool.



Grinding towards the edge.



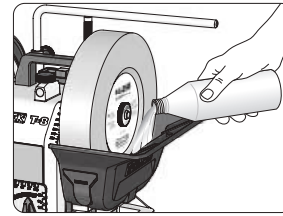
Grinding away from the edge.



Honing away from the edge.

Water Filling

Fill the trough with the grindstone running and with the trough raised, until the water reaches the *max water level* line inside the trough. Continue filling until the stone cannot absorb any more water, which is approx. 1.2 litre (2 pints) for the T-8 and 0.6 litre (1 pint) for the T-4 (less water is needed when sharpening with the Tormek Diamond Wheels, as they do not absorb any water). The stones must run in water at all times when grinding.

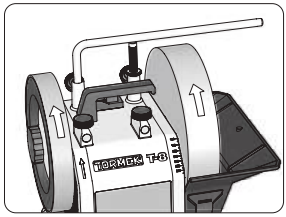


Positioning of the Universal Support

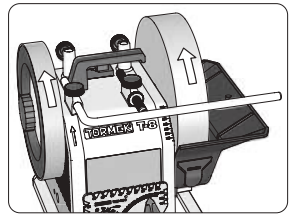
The Universal Support can be placed either in the vertical sleeves or in a horizontal base. These two positions enable you to grind either towards the edge or away from the edge. Some tools are best ground, or must be ground, in one of the directions while other tools can be ground in both directions. The recommended grinding direction and the position of the Universal Support for each tool are shown in the instructions.

The Truing Tool must operate with the Universal Support placed in the vertical sleeves (towards the edge position). The Universal Support can also be placed horizontally for honing with jigs. Honing must always be done with the wheel running away from the edge.

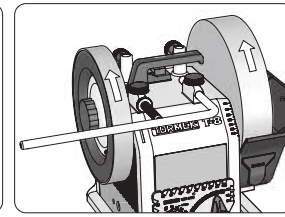
The Universal Support can be placed in three positions:



Vertically in the two sleeves. For grinding towards the edge.



Horizontally for grinding away from the edge.

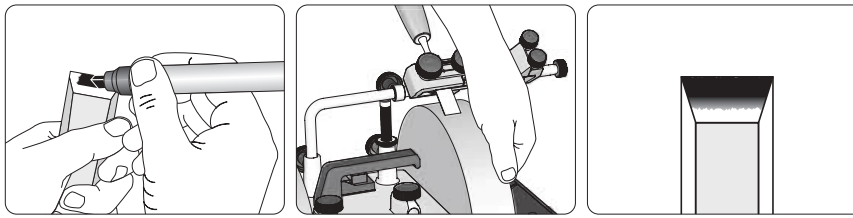


Horizontally for honing away from the edge.

Replicating an Existing Edge Angle

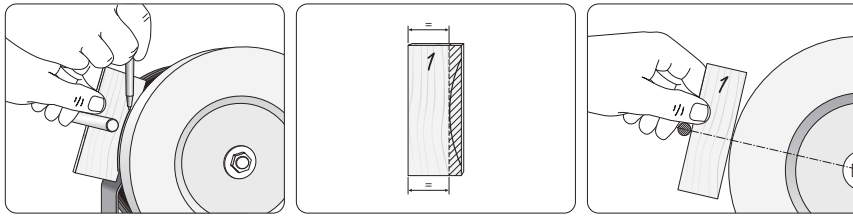
There are in principle two ways of replicating an existing edge angle on all tools when using the Tormek jigs, namely the *Marker Method* and the *Spacer Block Method*. For turning tools the Tormek *Turning Tool Setter TTS-100* offers you a third method, which gives you an exact replication of both the edge angle and the shape.

1. The Marker Method



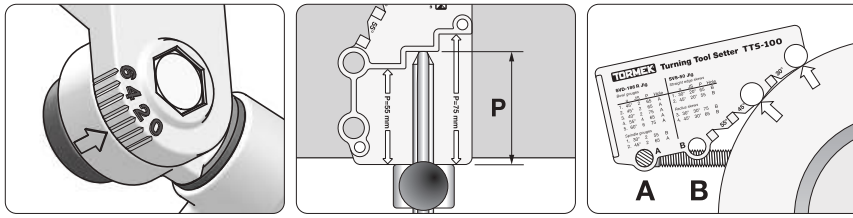
Colour the bevel with a permanent marker. Rotate the stone by hand and adjust the setting until the grindstone removes the colouring from the tip to the heel.

2. The Spacer Block Method



This method requires a constant stone diameter to give an exact replication. Place a rectangular wooden block close to the stone and mark the contour. Draw a parallel line and cut away the surplus wood. Now you have a wooden spacer, which lets you copy the setting of the Universal Support.

3. The Tormek TTS-100 Method for turning tools



Set the jig, JS.

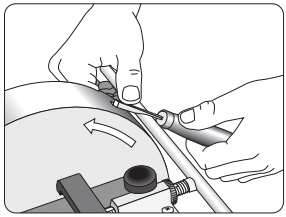
Mount the tool with protrusion, P.

Set the Universal Support. Use hole A or hole B.

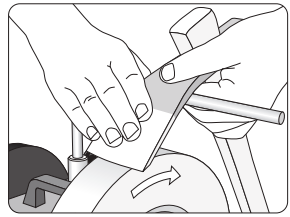
The Universal Support as Tool Rest

The Universal Support is a good aid when grinding various types of tools.

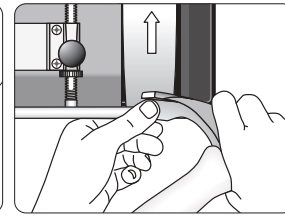
Examples of tools



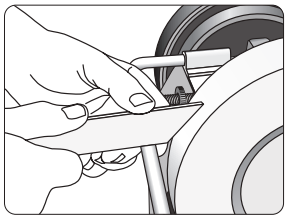
Extra short woodcarving chisels are ground by resting them directly on the Universal Support utilising the shoulder as a stop. The Universal Support is placed horizontally for grinding away from the edge.



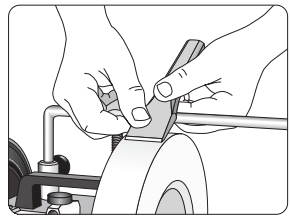
Large axes and adzes are rested on the Universal Support. Use your index finger as a stop. The Universal Support is placed vertically for grinding towards the edge for the most effective grinding.



Hollowing adzes are best ground along the edge. The Universal Support is placed horizontally for grinding away from the edge.



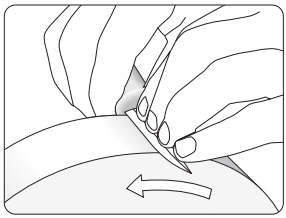
Wide turning parting tools you rest on the Universal Support, which is placed horizontally.



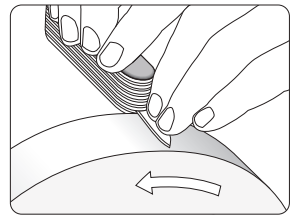
Stone working chisels. Place the Universal Support vertically. Let your index finger work as a stop.

Free-hand Grinding

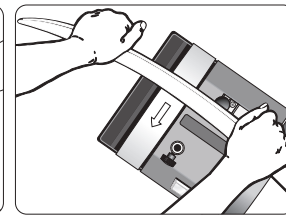
With free-hand grinding you grind away from the edge. This direction gives you the best control as you avoid the risk of the tool digging into the grinding wheel. You can also better observe the grinding process, as no water flows over the edge.



Grinding a short wood carving knife. Rest your hands on the Universal Support and keep your fingers close to the grinding wheel for best control.

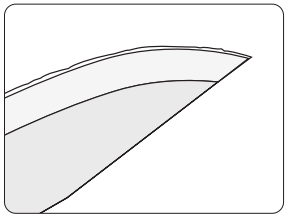


Grinding a pocket knife. Use a light grinding pressure so that the blade does not fold. First grade the grindstone to fine grinding with the Stone Grader SP-650 (when sharpening on the Tormek Original Grindstone).



This is the best way to grind a scythe. As no water flows over the edge, it is easy to observe the burr developing. Hold your elbows close to your body. The honing wheel is removed.

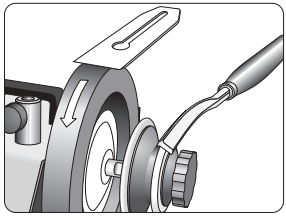
Honing and Polishing



The burr on a knife.

Burr

When a tool is being ground, a burr develops on the upper side of the edge. This is a confirmation that you have ground fully out to the tip of the edge. When grinding the other side (if both sides are ground) the burr still remains but will now be bent to the other side of the edge. This burr must be honed off in a gentle way to achieve a really sharp and durable edge. It must not be broken off, otherwise micro damage will be left on the edge.



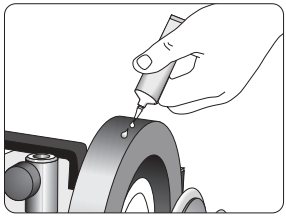
The profiled honing wheel is an accessory mounted outside the standard honing wheel.

Honing Wheels

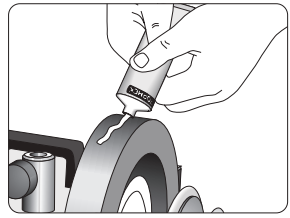
You hone away the burr on the Tormek honing wheels, which are made of special leather and then impregnated with the Tormek honing compound. The leather removes the burr gently like the barber's leather strop, giving you a razor sharpness and a bevel polished to a mirror finish.

There is a large, flat honing wheel fitted as standard and as an accessory you can fit a profiled wheel for the inside honing of gouges and V-tools.

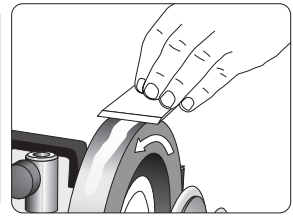
Preparation of the honing wheel



*Firstly, impregnate the leather with the oil * included, use approx ⅔ of the tube for the T-8 and half the tube for the T-4. It will soften the leather and cause the honing compound to penetrate.*



Apply a thin string of the compound before starting the machine. Rotate the wheel by hand.



Start the machine and distribute the compound by pressing a tool gently against the wheel. Let the compound penetrate the leather.

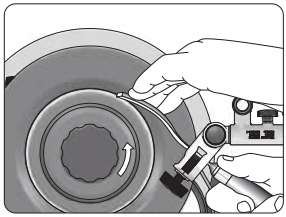
One application lasts for 5–10 tools. Then re-impregnate the honing wheel with a few drops of oil and apply fresh honing compound. Work the honing compound into the leather. Do not let the compound dry, apply more oil if necessary.

** 100% Pharmaceutical white oil. Material safety data sheet available from www.tormek.com*

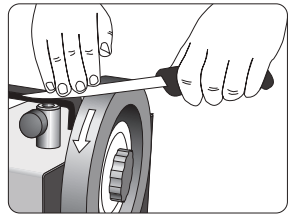
Honing

You can hone either free-hand or let the tool remain in the jig after the grinding. Set the jig so that the honing is carried out at exactly the same angle as the previous grinding. This is especially advantageous when honing the bevel on gouges where with free-hand honing it is difficult to exactly follow the shape. The inside is honed free-hand. Honing must always be carried out *away from* the edge.

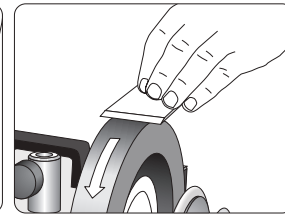
Honing free-hand



The inside on gouges and V-tools are honed on the profiled wheel.

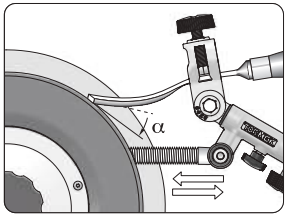


Honing a long knife. Hold the blade diagonally to clear the grindstone.

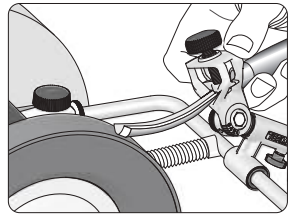


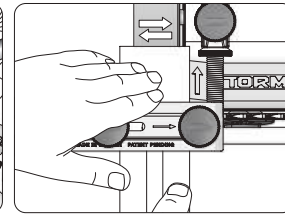
Honing the back on a plane iron.

Honing with jigs



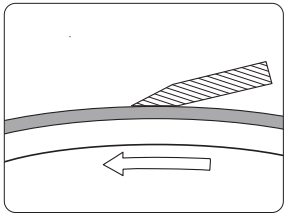
Honing a curved gouge in the SVD-186 R jig. Set the universal support so that you have the same honing angle as the grinding angle.



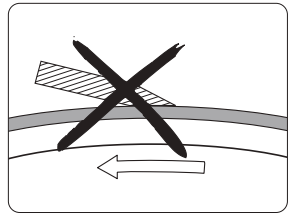


Honing a plane iron in the SE-77 jig.

Honing direction



Always hone away from the edge!



If you hone towards the edge, it cuts into the wheel!

Note *The leather honing wheel is made with a strip of leather glued onto a plastic rim. This strip has a glued joint, which is sanded down at the factory to the surface of the leather. After a period of use, when the leather has become depressed, the glued joint can remain above the leather surface. You can easily sand away this thin layer of glue by carefully using sanding paper mounted on a wooden piece.*

Benefits of Proper Honing

All edge tools should be honed properly to work to the maximum efficiency. The only exception is scissors. As well as removing the burr, the two surfaces forming the edge should be honed so you get as fine a surface as is practically possible. An edge with finer surfaces on the bevels is not only sharper and cuts more easily, it also makes the sharpness more durable. Furthermore a smooth and shiny surface has less friction against the wood which makes it easier to work with the tool.

Honing of Turning Tools

The advantages of honing the bevels to a finer surface are well known and used for plane irons, wood chisels, knives and woodcarving tools. These advantages are equally valid for woodturning tools but some turners do not pay the same attention to the honing as cabinet makers and woodcarvers do.

The reason is that the grinding and sharpening of, for example, a fingernail shaped bowl gouge or a curved skew chisel is quite a difficult task with the conventional free-hand grinding method on a bench grinder followed by repeated honings with honing stones and slip stones. Even if your are experienced and skilled, it is difficult to avoid faceting on the bevel and the honing takes time from the turning. Therefore most turners accept an “almost” sharp edge without honing and instead frequently resharpen on the bench grinder.

With the Tormek method the sharpening is fully controlled as well as the honing. The whole operation – setting, sharpening and honing – takes only a few minutes and is therefore time well invested. A honed tool cuts more easily, causes less friction against the wood, gives the wood a finer surface and the edge stays sharp much longer. You also save time, as you do not need to sharpen so often and your tools last longer.

Polishing

The Tormek leather honing wheel and honing compound increase the versatility of your grinder – it will also work as a polishing machine. You can also polish chrome-plated surfaces, as well as brass, copper, silver and aluminium to the highest lustre.