Diamond Machining Technology 85 Hayes Memorial Drive Marlborough MA 01752 USA • Tel: 508.481.5944 or 800.666.4DMT Fax: 508.485.3924 • www.dmtsharp.com

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Basic and Tips

A cutting edge is comprised of the intersection of two planes to form an edge. The angle formed by these two planes is the bevel angle. Sharpening is the removal of material from a bevel face to keep a well-defined edge. Sharp tools are as essential as anything to an outdoorsman/sports enthusiast, chef/home-chef, DIYer, woodworker, etc. and maintaining a sharp edge allows for a safer easier working environment. Keeping a sharp edge on your tools is quick and simple when using a DMT diamond stone in pocket and bench stone models. Using interrupted or polka-dot models, the diamonds remove material from the blade as it slides across the sharpener. The material is swept away by a water lubricant and caught in the recessed holes of the plastic polka-dot pattern and washed off after use. This polka-dot pattern is extremely efficient and great for blades with long cutting edges. DMT also produces a line of continuous diamond surfaced stone—Dia-Sharp® models. This line offers a choice if a continuous surface is preferred and are also ideal for tools with small points. DMT diamond stones come in four standard grits of extra-coarse, coarse, fine and extra-fine. Some models offer two additional grits: a 120 micron / 120 mesh extra extra coarse and a 3 micron / 8000 mesh extra extra fine. There are also 3 grits of diamond Dia-Paste™ (6 micron, 3 micron & 1 micron) and one in DiaSpray™ (.5 micron). The paste and spray are mainly used for polishing, such as backs and faces of chisels and plane blades. All grits are color coded and measured in microns. DMT's grit chart follows and the demonstrator should study and possibly use as a handout in the sharpening seminar.

A few quick strokes when you notice your blade starts to dull and you will never be without a keen edge. Most people new to diamond sharpening tend to over sharpen their edges. About 30 strokes on a conventional sharpening stone is equivalent to about 5 or 6 strokes on a DMT diamond stone. This will save time and extend the life of your tool. You can also repair lost edges or nicks by starting with larger grit sizes and stepping down as the edge gets sharper. One thing to try to do is match the bevel with the sharpener when sharpening. Even more important than matching the bevel however is to keep a constant angle so you have a consistent edge.

TIP: Grit Selection Rough work = coarser grits; fine work = finer grits. If an edge is damaged, you need an aggressive grit to repair and then progress into finer grits based on the edge you need. You progress in the grits as far as the work dictates. Cutting rope or boxes, you want a bite to your edge, so coarse diamond is sufficient. Slicing tomatoes or planing wood or other fine cutting tasks, means finishing with fine or extra-fine diamond grits.

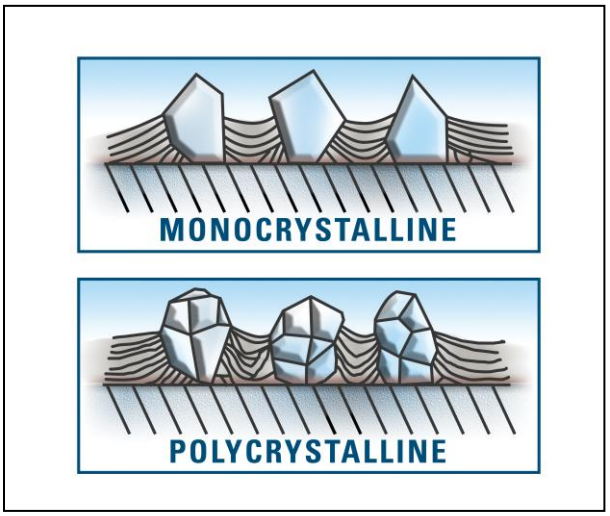
TIP: Quarter Trick An easy way to get this angle is to stack two quarters on top of each other and lay the blade on them. This angle is about 20°. (Good for bench stones / knives)

TIP: Paper Guide Another method to get a quick angle guide is to fold a small piece of paper in half on the diagonal, then in half again along the same edge. The paper edge goes from 90° to 45° to a self standing 22.5° guide. (Good for bench stones / knives)

TIP: Marker Trick Take a marker and color the bevel. Next do your best to match the bevel and take a stroke on the blade. If the mark on the bevel is still visible, adjust the angle until you remove the rest of the marker. (Good for all type sharpening stones / all bevels)

Quick Review

- Sharpening = removal of material.
- Sharpening keeps tools safer and easier to use.
- Recessed plastic Diamond Whetstone™ vs. Dia-Sharp® product line.
- Start with larger grit sizes then step down.
- Match bevel angle (but keep angle constant).
- Color Coding, different micron and grit sizes.
- Do not over sharpen.



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Why DMT® Diamond?

DMT diamond sharpeners give many advantages over other types of sharpeners as well as other brands of diamond sharpeners. First of all, DMT uses mono-crystalline diamond: A type of diamond that is superior to poly-crystalline diamond, what many other brands of diamond sharpeners use.

The difference between the two is like an ice cube (mono-crystalline) and a snow-cone (poly-crystalline) where the mono-crystalline diamond is made up of one particle and holds its form while the poly-crystalline diamond is made up of many small particles that get sheared off during use.

Another advantage of diamonds over other types of sharpening stones is that you can be sure the diamonds are harder than any material you are sharpening. DMT products will sharpen even the hardest materials such as ceramic and tungsten carbide. Diamond works faster than conventional whetstones and yet, doesn't take off as much material as an electric grinder, which can ruin the steel temper if burned during grind.

DMT products can be used dry or with water as a lubricant. Only a few sprays of a spray bottle and you are ready to sharpen. This avoids the mess caused by other products that need to be lubricated with oil or immersed in water before use.

DMT diamond stones are guaranteed to be flat. Most other brands are not flat when you purchase them and will hollow out in the middle after repeated use. Flatness is essential in sharpening all woodworking tools like chisels and plane irons. DMT manufactures the DiaFlat™ Lapping Plate to restore all conventional stones to a perfectly flat condition.

Quick Review-Why DMT® Diamond?

- DMT uses only mono-crystalline diamond.
- Sharpen even the hardest materials with diamond.
- Sharpens faster and easier and longer tool life
- Lubricate with water.
- Guaranteed flat.

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SHARPENING WITH DMT

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DMT® Color Grit System

Extra Extra Coarse | Aggressive edge repair when bringing a tool back from what looks like the end of life—a safe alternative to powered grinding. *Recommended for extreme stock removal to repair a much damaged edge or to quickly change a bevel angle. This grit is a safe alternative to power grinding, cutting quickly without heat build-up that can ruin tool temper. Unless the stone is designated "Diaflat" (that is, designed for flattening other stones), DMT does not recommend using for flattening waterstones, Arkansas stones, and synthetic stones. Size: 120 micron (120 mesh). Color code: silver.*

Extra Coarse | Use to rapidly repair damaged or real rough edge. *Recommended for aggressive removal of metal on damaged tools or for heavy-duty outdoor tools such as axes and lawn mower blades. This grit is commonly used as the first step in flattening the backs of chisels and plane irons and for rapid stock removal from a chipped or damaged edge. Unless the stone is designated "Diaflat" (that is, designed for flattening other stones), DMT does not recommend using for flattening Japanese waterstones. Size: 60 micron (220 mesh). Color code: black.*

Coarse | Transforms a dull edge to cutting condition. *Quickly restores a dull edge to cutting sharp. Customers that desire cutting fast action without worry of edge refinement often use our coarse models. Unless the stone is designated "Diaflat" (that is, designed for flattening other stones), DMT does not recommend using for flattening Japanese waterstones. Size: 45 micron (325 mesh). Color code: blue.*

Fine | Use to put a great edge on slightly dull knives or tools. *Restores to a fine edge any knife or tool that is slightly dull. Many of our customers consider the fine grit to be a medium/all purpose sharpener. Professional Chefs and gourmet cooks work through to our finer grit models. For woodworkers and sportsman who are stepping through the grits, it's the edge refinement step done before micro beveling and polishing. Size: 25 micron (600 mesh). Color code: red.*

Extra Fine | Gives everything a polished and razor sharp edge. *Refines knife or tool edge to razor sharp perfection. Size: 9 micron (1200 mesh). Color code: green.*

Extra Extra Fine | For the edge enthusiast who wants the ultimate edge. *Provides the finest grade micronized bonded diamond abrasive available anywhere for the ultimate edge refinement, achieving quick stock removal with millions of diamond cutting edges. Prior to break-in, using the extra-extra fine diamond will result in a matte to shiney finish (scratch pattern evident) on your edge or bevel; once fully broken in, you will achieve a lusterous finished edge. Size: 3 micron (8000 mesh). Color code: tan.*

HARDCOAT DIAMOND GRITS

Diaflat® HardCoat | Designed to withstand flattening many styles of bench stones. *Sizes: 120 micron (120 mesh), and 95 micron (160 mesh).*

Fine | Stands up to the rigors of ceramic knife sharpening and puts a great edge on slightly dull edge. *Size: 25 micron (600 mesh). Code: Red or marked FINE.*

Extra Fine | Stands up to the rigors of ceramic knife sharpening and provides a razor sharp edge. *Size: 9 micron (1200 mesh). Code: Green or marked X-FINE.*

OTHER:

Ceramic steel: 2200 mesh / 7 micron

Dia-Paste™ / Polishing Medium
6 micron, 3 micron, 1 micron

DiaSpray™ (0.5 micron)

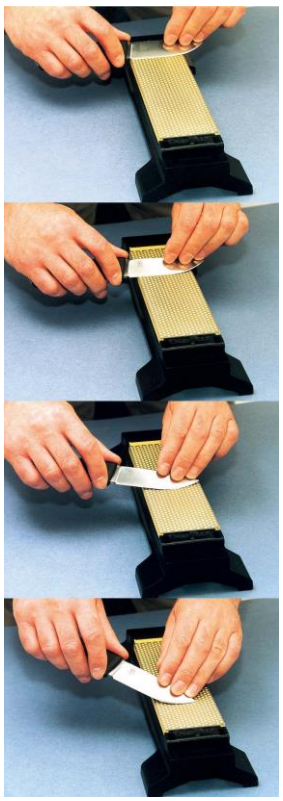
Diamond paste and diamond spray for polishing, such as backs and faces of chisels and plane blades.

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Basic Sharpening – Knife

When sharpening a knife it is usually suggested that you use a 20° to 25° angle. It is not so much important that you get the exact 20° angle as it is that you keep the angle constant. A good way to get this angle is to stack two quarters on top of each other and lay the blade on them. This angle is about 20°. One way to find out if you have matched the bevel is to take a marker and color the bevel. Next do your best to match the bevel and take a stroke on the sharpener. If there are still parts of the bevel with marker on them, adjust the angle of the knife to remove the rest of the marker. (Note: You can use this to match all bevels, not just knives).

A fine stone is usually sufficient for sharpening the blade of a knife; the coarse stone can be used before fine if the blade has dulled. Knives can be sharpened on virtually all DMT® products. With the blade at a 20° angle slide it across the sharpening stone from heel to toe of the blade. This will ensure that you are sharpening a constant edge on the blade. Be sure not to roll the blade because this will change the angle of the bevel. Also make sure you take the same number of strokes per side to ensure the bevels are the same. Complete 5 to 6 strokes on a side and then alternate to the other side with 5 to 6 strokes.



Quick Review

- Use a DMT Diamond Whetstone™, DuoSharp® or DiaSharp® bench stone OR
- Use any DMT portable sharpener: 70mm, 4”, Diafold®, Mini-Sharp®, Mini-Hone® models
- Approximate 20° angle but keep it constant (two quarters).
- Marker trick (can be used on all bevels, not just knives).
- Usually 25 micron (fine) is enough (45 micron (coarse) if dull).
- Heel to toe (don’t roll knife).
- Same amount of strokes per side.
- Use DMT Dia-Paste™, DiaSpray™ or Dia-Sharp® Extra Extra Fine 8” Bench Stone for a polished edge.





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Basic Sharpening – Chisel and Plane Iron

Flatten the Back (for a new or damaged chisel or plane iron)

When sharpening a new chisel or plane iron you are going to need to flatten the back— only the last ½" or so— before you sharpen the bevel. This is done by lubricating an extra-coarse Diamond Whetstone™, DuoSharp® or Dia-Sharp® Bench Stone with water and placing the chisel back down on the sharpener. Push downward on the back and move the chisel from one end of the diamond stone to the other the long way with long fluid strokes. Once a uniform scratch pattern has been established using the extra-coarse stone, step down through the grits to extra fine. Use the same procedure as with the extra-coarse stone. After all the diamond grits have been used you may step down into the Dia-Paste™, a diamond compound for polishing. Spread this paste on a substrate such as close-grained hard wood, MDF, cast iron, or glass and repeat the same procedure over the paste to achieve a true polished finish. Be certain to carefully clean all traces of paste off the chisel before stepping to finer micron size. This will give the back a mirror, polished finish. After the back is flattened (and polished) the bevel can be sharpened.

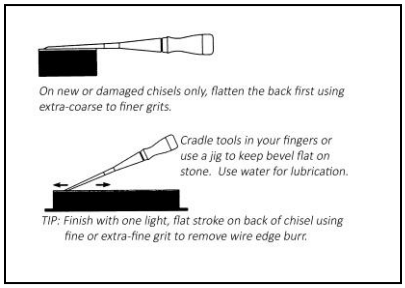
Sharpen the Bevel

Cradle the chisel or plane iron as shown below. Holding the chisel and iron in this manner simplifies keeping the angle constant. Make long fluid strokes back and forth pushing the face of the blade downward onto the stone. Use a fine diamond stone unless the blade is very dull or chipped, in which case start with a coarse diamond stone.

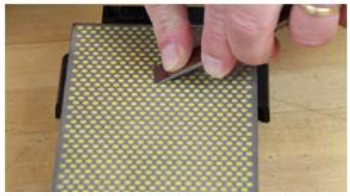
After sharpening the bevel, you may want to put a micro bevel on the end of the blade. This is done by holding the chisel in the same manner and matching the bevel to an extra-fine diamond stone. Now lift the chisel up a small amount to an angle about 1 or 2 degrees greater than the bevel. Only a few strokes and you have a sharp micro bevel. Finally, lay the back down flat again and give two quick strokes to take the wire burr off the back side.

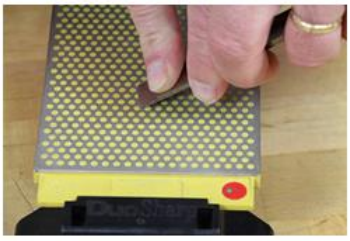
Quick Review

- Flatten back of new/damaged chisel or plane iron.
- Use a DuoSharp® or Dia-Sharp® Bench Stone or DMT® Diamond Whetstone™.
- Thumb and fingers are easy makeshift jig.
- Match bevel.
- Long fluid strokes back and forth.
- Micro bevel (few strokes at slightly greater angle if desired).
- Two final strokes on the back to take off burr.



Chisel – sharpening – across the stone's surface









Plane Iron – sharpening – across the stone's surface

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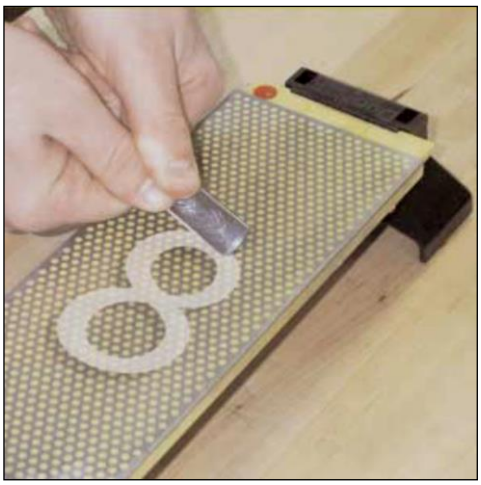
Basic Sharpening – Out-Cannel Gouge

Out-cannel gouges also appear tricky to sharpen. They can be done on a Diamond Whetstone™, DuoSharp® or Dia-Sharp® Bench Stone or the DMT Diamond Wave™. Simply match the outside bevel angle to the stone (see marker technique). Next, stroke lightly, lengthwise along the whetstone while slowly rolling the out-cannel gouge left to right. This will sharpen the entire bevel. Some people like to do this in a figure 8 pattern. Use a small Diamond Honing Cone to wipe the burr off the inside of the gouge.

Quick Review

- Diamond Whetstone™, DuoSharp® or Dia-Sharp® Bench Stone or Diamond Wave™.
- Match bevel angle.
- Stroke lengthwise rolling left to right.
- Deburr with small cone.





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Cleaning and Maintenance of DMT® Diamond Stones

Cleaning and care of a DMT stone is simple and necessary for best performance. After using a DMT diamond stone simply wet it (if it is not already lubricated with water) and wipe the slurry off with a rag.

This slurry is evidence that the sharpener has done its job.

If the swarf is not wiped off the sharpener after use it may clog up the diamond and not allow it to sharpen as well as it could were it clean.

Also, once in a while it is a good idea to get a common cleaning agent (i.e. Comet or AJAX) and scrub the sharpener with a nylon brush or Scotch Brite pad. This will ensure the sharpener is not clogged with slurry and will allow for optimal sharpening.

Finally, make sure you store your sharpeners dry after you clean them off.

Quick Review

- Clean off with rag after use.
- Not cleaning will result in clogging.
- Scrub with cleaner periodically.
- Store dry.